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Kirsten Jenkins · Yekeen A. Sanusi
Wang Guoyu   *Editors*

Energy Justice Across Borders

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Part I
Setting the Scene

Chapter 1
Expanding Ethics Justice Across Borders: The Role of Global Philosophy

Check for updates

Gunter Bombaerts⬡, **Kirsten Jenkins**⬡, **Yekeen A. Sanusi, and Wang Guoyu**

Abstract Our energy systems are truly international, and yet even now, our energy policies tend to be grounded at the national level and in many instances, remain ill-equipped to tackle transboundary energy issues. Our energy policy systems are also largely detached from the concerns of ethics or justice. It follows that we must find new and innovative ways of not conceptualising these normative issues, but of operationalising response to them. This book stems from the emergent gap: the need for comparative approaches to energy justice, and for those that consider non-Western ethical traditions. Opening the edited volume, this chapter begins by giving context to the concept of "energy justice" itself and outlines our comparative philosophical approach to it, focusing specifically on "global philosophy" for its role in dialectically engaging with philosophies from around the world. We then show how the different chapters of the volume contribute to this purpose in four parts: setting the scene, practice, applying theory to practice and theoretical approaches. The final section of this chapter concludes with reflections on the contribution of global philosophy approaches to energy justice as with a set of future research recommendations. Through these recommendations, and all of those within, we position the book as one that contributes to energy justice scholarship across borders of nations, borders of ways of thinking and borders of disciplines.

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1.1 Introduction

Our energy systems are truly international, and so are their social justice impacts. Whether it is the shipment of precious metals for wind turbine production, the transfer of waste products or international grid networks, almost all of our energy crosses national borders. With this, it also crosses ways of thinking and often, academic disciplines. Kazakh uranium mining, Japanese nuclear powerplant operation, South-African nuclear energy production and Brazilian nuclear waste management can and will touch upon very different ethical systems, notions of "right" and "wrong" or local aspects of energy justice. Yet even now, our energy policies tend to be grounded at the national level and in many instances, remain ill-equipped to tackle transboundary energy issues (Goldthau and Sovacool 2012; Jenkins and Taebi 2019). Our energy policy systems are also largely detached from the concerns of ethics or justice (Jenkins et al. 2018), even though they tacitly represent sets of values around how energy systems *ought* to operate and who for. It follows that we must find new and innovative ways of not conceptualising these normative issues, but of operationalising response to them. This book stems from the emergent gap: the need for comparative approaches to energy justice, and for those that consider non-Western ethical traditions.

Beyond a solely normative endeavour, the pragmatic necessity of such an approach is clear. The rate and scale of the energy transition from fossil fuels to renewable energy and storage represents a major policy challenge. Yet whilst there has been some global forward momentum, progress on energy and climate policy has so far been phlegmatic. This challenge stems, in part, from failures to secure the social acceptance of technological shifts. This social resistance—which typically slows the pace of change—pervades every stage in the global energy system at a range of levels, from resource extraction to production, consumption, waste and reuse. As the energy transition moves forward, better understandings of the nature of the justice challenges that emerge in energy systems are needed not only to enable progress, but also to avoid reinforcing social vulnerabilities. The dangers of reinforcing social vulnerabilities are also pressingly clear, in that parts of the world still strengthening their economic development and therefore are comparatively vulnerable to new or emerging injustices (Monyei et al. 2018). Without energy development or energy systems development mindful of culturally relevant and welcome development, more harm than benefit could be done.

With the basis of a globalised energy system, local energy justice specificities and energy justice vulnerabilities, our aim is to see how different ethical systems can add to our understanding of what "energy justice" and "energy ethics" are, and how we ingrain them into energy policy at the local and the global level. In essence, we want to enlarge the ethical evaluations of energy technology development and the surrounding policy for it. The result is a unique contribution that across novel chapters marries a philosophical focus (with emphasis on different ethical systems, ancient or contemporary philosophies) to empirical/policy-oriented focus (with emphasis on how certain values play a role in current societies). Yet of course, we

are limited in what this book can achieve given the truly global scale of the issues involved. Thus, with such a vast field before us, we ask a few guiding questions that will begin the debate. What are the key aspects of ethical systems for global energy justice? How can these ethical systems contribute to the evaluation of energy systems across borders? And how can these theoretical elaborations contribute to actual changes in local and global energy policy practices?

To begin, this chapter first gives context to the concept of "energy justice" itself and outlines our comparative philosophical approach to it. From several approaches within comparative philosophy, we then focus on "global philosophy" for its role in dialectically engaging with philosophies from around the world. This brings us towards truly global notions of energy justice and creates a framework that urges for the combination of practices and theories at local as well as global levels. We then show how the different chapters of the volume contribute to this purpose in four parts: setting the scene, practice, applying theory to practice and theoretical approaches. The final section of this chapter concludes with reflections on the contribution of global philosophy approaches to energy justice as with a set of future research recommendations.

1.2 What Is "Energy Justice" in an International Context?

Rooted in the growing awareness of the connections between energy and social justice, the energy justice concept emerged, incorporating literature from environmental and climate justice as it developed (Hall 2013). The result is a framework that aims "to provide all individuals, across all areas, with safe, affordable and sustainable energy" (McCauley et al. 2013: 1; Jenkins et al. 2018). In this way, McCauley (2018: 1) positions it as "a framework that allows us to critique the problems of the global energy system, as well as to lead us to better decision-making in future energy investments, in both the private and public spheres". In order to conceptualise this goal of energy justice and the means of achieving it, a range of tenet frameworks have been developed. The most widely used of these is the approach outlined by McCauley et al. (2013), which focuses on distributional justice, procedural justice and justice as recognition. Within, each "tenet" is employed on the logic that if injustice is to be tackled, you must (a) identify the concern—distribution, (b) identify who it affects—recognition and only then (c) identify strategies for remediation—procedure (Jenkins et al. 2016). In more detail, distributional justice is concerned with the impacts of infrastructure; justice as recognition represents a concern for who is, or who is not, included in these decisions; and procedural justice investigates the mechanisms through which those decisions occur.

With increasing popularity over the last 10 years, energy justice investigations have emerged with regard to whole systems, ethical behaviour and climate change mitigation, amongst other topics (Jenkins et al. 2016). Further studies have applied energy justice concepts to household energy consumption, energy policymaking,

cities, fuel poverty and consumption and mobility, amongst others. Heffron and McCauley (2017) identify that these studies appear across academic sectors, showing not only the breadth of topical investigations, but also disciplinary and interdisciplinary reach too. Three special issues with "energy justice" in their title aid this proliferation, one in *Energy Policy* (Jenkins et al. 2017), one in *Energy Research and Social Science* (Simcock and Mullen 2016) and, in the latter stages of 2018 and early stages of 2019, one in *Applied Energy* (McCauley et al. 2019). Yet despite the widening popularity of the term, a core limitation has emerged; the authors writing in this field still tend to come from a limited range of country perspectives, where a classical approach of evaluation technologies is through the lens of European and North American ethics (for a good example, see Sovacool and Dworkin 2015).

Arguably then, the energy justice literature may fall prey to homogenising global perspectives or to unjustly misrecognising the ethical perspectives of other people, places and histories. Thus, throughout this volume, we present an attempt to enlarge the evaluation to one that engages different ethical systems, including explicitly non-European perspectives (Sovacool et al. 2017). We do so through a focus on a range of technologies and countries, from solar in India to nuclear in Kazakhstan and hydropower in Brazil, for instance. We also do so through explorations of core energy issues pervading national policy landscapes in India, Nepal and Kenya. Although variously achieved, our idea is that we use the ethical systems in these places to comparatively consider a range of energy justice judgments. This, then, is an early step towards the first truly international perspective on energy justice. Uniquely, we do this through the lens of comparative philosophy, and specifically that of *global philosophy*, presenting a volume that is the first of its kind.

1.3   Global Philosophy Across Borders[1]

Comparative philosophy is a broad concept, yet as a core element in this volume's approach, it needs to be further specified. There is a debate amongst comparative philosophers about what comparative philosophy is or should be. Allinson (2001), for example, states that *all* philosophy is comparative philosophy given all philosophical reasoning compares one way of being at least something else. Wong (2017) defines it more explicitly, stating that comparative philosophy brings together philosophical traditions that have developed in relative isolation from one another and that are distinguishable both culturally and regionally. He uses the example of Chinese versus Western perspectives as two that are classically considered as distinct. In such contexts, comparison is possible along the lines of methodological commensurability (whether and how comparisons can be made), metaphysical and epistemological commensurability (a comparison of traditions on the conceptions

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[1] This paragraph builds strongly on Connolly (2015).

of "real", for instance) and ethical commensurability (comparison of these traditions on the matters of how people ought to live their lives, for instance) (Wong 2017). Following this definition, we pragmatically consider comparative philosophy as philosophy that considers and compares "sufficiently distinct cultures and traditions" (Connolly 2015: 24).

Within comparative philosophy, several approaches to study these "sufficiently distinct cultures and traditions" have emerged, each of which carries a strongly differential set of assumptions. To set the scene for the chapters that follow and to provide rationale for our particular focus, we draw attention to four particular comparative approaches: universalism, pluralism, consensus and global philosophy.

Universalist approaches start from the assumption that philosophy in general—and in our case, issues of energy justice in particular—should lead to the construction of a world philosophy through the synthesis of prominent global traditions. Some universalists see the goal of comparative philosophy to develop into a framework that can serve as a foundation of a transnational political community (Clarke 2002: 119). Others are less strict and see the universalist idea more as an end point. As Zhao (2009: 106) puts it, "universalism is not something ready at hand, but a matter of reconstruction, a potentiality to be realized, and a consequence of collaborative dialogues". As a famous example, Dahlsgaard et al. (2005) identify that six core virtues—courage, justice, humanity, temperance, wisdom and transcendence—recur in the philosophical and religious traditional writings in Confucianism, Daoism, Buddhism, Hinduism, Athenian philosophy, Judaism, Christianity and Islam. The authors thus concluded that "justice and humanity showed up the most reliably in that they made every tradition's list; they tended to be named explicitly, and we suspect, given their crucial importance to the survival of even the smallest society, that they are truly universal" (p. 210). Bennett (2011) concluded the same for the concept of "divine justice" in Islamic eschatology, Judaism, Christianity, Hinduism and Buddhism.

A second approach, *pluralism*, states that differences between cultures are both justified and irreducible to one another. Put another way, it appreciates that "a culture can to some extent consist of commonly recognized values, but that these values provide a counterpoint to one another. The identity of a culture is, in part, defined by which values are the most salient and which ones serve as counterpoints to others. […] No judgment of superiority can be made here. Each sort of ethic focuses on a good that may reasonably occupy the centre of an ethical ideal for human life" (Wong 1989: 65). Fan (1997) defends this position in the justice debate by pointing at the differences in the implicit assumptions between Rawls' theory of *justice* and the theory of *ren* by Confucius. Amongst other observations, Fan mentions that Rawls mainly looks at the distribution of instrumental goods as opposed to the counterfocus on intrinsic goods. This difference stems from two diverse values underlying the theory. On the one hand, the two core features of Rawls' theory, according to Fan, are that all persons are equal in a morally relative sense given they are "equally rational, similarly capable of grasping a conception of their good and a sense of justice" (Rawls 1971: 505) and that all persons are mutually disinterested individuals leading to a symmetrical relation. On the other hand, the

Confucian principle of *ren* refers to the moral invitation that all humans love all humans. The conclusion of his comparison is that "it remains reconcilable with only some, but not all reasonable comprehensive conceptions of the good life that various people hold. Confucianism, as a useful and significant example, stands firmly in contrast to Rawlsianism regarding a series of important moral and political assumptions" (Fan 1997: 448). This is to say that the plurality of these perspectives means that each carries its own benefits and points of distinctions.

A third strand of comparative philosophy proposes a balance between universalism and pluralism; a *consensus approach* that combines both views. Rawls (1987: 178) outlines an approach that establishes "a set of norms shared by multiple traditions, while at the same time allowing for diversity of acceptable philosophical foundations to these norms". Rawls also perceives that an overlapping consensus is possible in which different religious philosophical worldviews congregate to a collection of shared norms, even though they are based on the set of individual reasons that are not necessarily compatible with one another.

These three comparative philosophical views face some classical challenges. One reoccurring question is on the feasibility of generalising evidence in the social sciences, or of linguistic, foundational and evaluative incommensurability (Wong 1989; Connolly 2015). Yet for our story throughout this volume, the issue of one-sidedness is more important. The topic of "asymmetry" is central in comparative philosophy debates, referring to the idea that Chinese perspectives, for example, tend to be compared in reference to frameworks, concepts or issues found in Western philosophical discussions. That is, in these comparisons, "local, idiosyncratic experiences from moments in Greek, Roman, or European history are [often] taken as normative expectations for all of humanity" (Angle 2002: 5). Or, as Shun (in Connolly 2015: 108) put it: "while we see frequent deployment of Western philosophical frameworks in the study of Chinese thought, we rarely encounter the reverse phenomenon, namely the deployment of Chinese philosophical frameworks in the study of Western thought". Wiredu (1996) warns that the asymmetry can lead to intellectual colonisation, in which the original meaning and understanding is completely erased and replaced by the colonial philosophical framework; an idea that bares striking similarities to misrecognition or misrepresentation as an aspect of energy justice, perhaps. What is more, this trend of one-sidedness is particularly disconcerting given that scholars such a Krishna (1988) have evidenced that the achievements in various fields within several cultures paralleled those in the West, so that they could not be regarded as inferior in any way.

Comparative philosophy scholars have indicated different ways to try to avoid this one-sidedness. Ivanhoe (2011) sees contextualisation by reconstructing historical meaning as a solution. Hall and Ames (2003) explored the beneficial role of differentiation, in which comparative philosophers analyse how the general assumptions of the cultural tradition in which the text was written differ from our own. Stalnaker (2006) mentions "bridge concepts" that capture the general assumptions of two different philosophical approaches as "person", "virtue" and "human nature". Parekh (1999) adds that reaching consensus is not realised by

making abstraction of our moral religious and philosophical values, but rather through dialogue about these values and our reasons for holding them with members of other cultures. All such proposals circle around a fourth approach in comparative philosophy—global philosophy—which has been identified as a strand that partially overcomes these contradictions.

For Connolly (2015), the goal of global philosophy is to compare traditions to creatively interact at specific points in the philosophical arena rather than to compare fixed historical traditions. In this regard, comparative philosophers are positioned as scholars that should engage in philosophy in a way that is open to the insights and approaches from other philosophers and philosophical traditions around the globe. Fay (1996: 233–234), talking of interactionism, states that appropriate comparative philosophy "conceives of the relation of the self and the other dialectically, it denies that 'at bottom' the self and the other are essentially distinct and fixed, or that a particular identity means utter difference form that which it is not. Instead it insists that the identity of the self is intimately bound up with the identity of the other and vice versa, that self and other are constantly in flux and that they are both similar as well as different. […] The principle lesson […] is engage, learn from, adapt, or perish". Global philosophy makes a political and empowerment statement. As Ikuenobe (1997: 196) puts it, "To deny a people a philosophy is to deny them any kind of intellectual activity, a system of thought, culture and civilization". Comparative philosophers thus see two interrelated purposes for themselves (Connolly 2015: 33) that is interpretative work "using terms, ideas, or concepts from one philosophical tradition to help understand or interpret another philosophical tradition" and constructively "seeking to advance or develop philosophy through cross-tradition engagement". We see this as the core of global philosophy. It follows that energy justice should be engaged with and aim for adaptations created through a constant dialectical process across borders.

Global philosophy should take relevant parts from the three previous views, universalism, pluralism and consensus. From universalism, it should borrow the notion that humans around the world share some common elements in biology, psychology or grounding experiences (Nussbaum 1988). From the pluralist approach, it should take the specificity of culture and tradition as important elements. It also agrees with the consensus approach that combining views is core, but does not agree to the purely rational way in which this can be done. Instead, in its interaction with specific points in the contemporary philosophical arena, global philosophy can be productive, critical (Struhl 2010; Connolly 2015: 196) and focused on problem-solving. Garfield (2014: 8) gives the example that "a central motivation for studying classical Buddhist texts is that they engage with questions and problems in which we are interested, sharing enough common ground for us to understand what they have to say and contributing enough that is new that we have some reason to listen to it". As we illustrated, Fay (1996) and Connolly (2015), amongst others, stress the indispensable need for engagement. Thus, the important challenge in comparative philosophy is to bridge the gap between universalists who optimise the communication across boundaries and pluralists who optimise in acknowledging the uniqueness and

richness of every approach. A purely theoretical world philosophy approach is, therefore, doomed to fail and needs the interaction between theory and practice at its core.

1.4 Towards Global Energy Justice

This volume uses the global philosophy approach in comparative philosophy to explore energy justice without borders. The idea of this volume emerged during energy justice discussions at a workshop in Europe, amongst Europeans discussing the contributions of a list of European and U.S. philosophers. Dominant amongst this discussion was the work of Sovacool and Dworkin (2015), who gave a very elaborate and useful overview of analytical applications to energy problems. They refer to energy efficiency and Plato's and Aristotle's virtue approaches; energy externalities and Bentham's utility theory; Kant's human rights approach; procedural justice as described by Jefferson and Habermas; energy poverty insights from Rawls, Sen and Nussbaum; energy subsidies based on the freedom concept of Nozick and Friedman; energy resources based on Dworkin's ideas on posterity; and fairness and responsibility in Singers' plea against climate change, for instance. Yet apart from Nussbaum, this list consists solely of men, and apart from Sen, all contributors seem to represent a largely Western way of thinking. As such, although the overview is very helpful, we could argue that this approach is implicitly universalist. Indeed, when considering their global application, their combination sends an unspoken message that these theories with their concepts *can* be successfully applied worldwide, and therefore that they *should* be.

From a philosophical point of view, this issue is not problematic per se. As universalists would argue, their approach may indeed be either the normatively *right* way or pragmatically the *best* way forward to consider cross-border energy justice issues. Above, we discussed Fan's view on Rawlsian justice and Confucian *ren* and Fan's pluralistic conclusion that Confucianism firmly stands in contrast of Rawlsian theory, for instance. This pluralistic approach certainly does honour the differences in different ways of thinking. Yet it also shows the difficulties that follow from it. Fan, as a comparative scholar, can conclude that Rawls and Confucius are using entirely distinct concepts and principles and therefore, that people evaluating energy systems from a Confucian perspective should not be deprived of using it as a universalist approach that opposes another way of thinking to theirs. Nonetheless, it remains the case that energy policy researchers and practitioners are faced with worldwide energy practices that necessitate worldwide solutions. The incommensurability should be overcome at a theoretical or practical level to find solutions.

In a bid to overcome this challenge, this volume presents some of the first discussions on comparative philosophy-based approaches to energy justice. How can energy justice cross borders? How can energy justice compare traditions to mutually engage, learn from each other and where appropriate, adapt to find common

grounds for common solutions to common challenges? To our knowledge, this endeavour is currently missing in the energy justice literature, even though a very few scholars have elaborated first steps that are instrumental in this novel field, but in a distinct and isolated way. Guruswamy (2016) explores the jurisprudential lineages of justice within Western, Islamic, Buddhist and Confucian traditions. Sovacool et al. (2017: 680) made a first inquiry in non-Western applications of energy justice when they mapped several applications of differential ethical approaches to energy and energy justice. They outlined that Ubuntu philosophy is linked with neighbourhood efforts to foster energy efficiency and decisions about energy resources within a local society, for example. Taoism and Confucianism can represent a plea for respecting due process in energy policy and decision-making, building on human rights protection when executing energy projects. Hinduism is seeking to minimise the extent and allocation of energy externalities, offering affordable energy access to help fight energy deprivation. Buddhism is said to focus on respect of future generations with energy system management, minimising harm to the environment and the entire world. Indigenous perspectives, finally, can focus on energy systems elaborated cautiously through long-term experience and sovereign cultural procedures, requesting restoration and avoiding disruptive ecosystem transformations.

We must acknowledge, of course, that the endeavours to widen European and North American approaches to energy justice to a broader *global* approach face a very central challenge. At the theoretical level of analysing justice from a comparative philosophy perspective, Tan (2015: 219) strongly questions the universality of the notion of justice itself. Tan pleas that "any proposed distribution arrangement must be assessed against the needs of the human participants in the social relationship at stake and the needs of those relationships". Her point that the Confucian concept *yi* is often translated as *just*, meaning both "to treat like cases alike and treat different cases differently" (Tan 2015: 205). Tan points out that a closer look at these cases clarifies that "it is not the distributive question that drives […] whether it is yi to have, take, or accept things. There is no concern about whether those involved receive or deserve equal shares, or arguments over whether someone should have more or less of something, or something proportional to some kind of merit. Instead, the concern is overwhelmingly about the effect of actions on specific interpersonal relationships, actual or potential" (Ibid., p. 207). For example, the criterion whether a gift initiates or invokes an ethically appropriate relationship between the giver and the recipient is crucial. Thus, pushing us beyond just a consideration of which Western approach is bet (as in McCauley's (2018) consideration of liberalism and libertarianism); this conclusion poses a strenuous challenge to the justice element of global energy justice in particular, as it seems a Western concept that is "pushed" into global philosophy. Problematising current advances in this notion of justice through a global philosophy approach, each chapter in our volume contributes to this significant challenge in the literature, serving, in turn, as guiding frameworks in energy justice or as practical insights into improvements in local and global energy policy.

1.5 About the Book

Energy Justice Across Borders will contribute to emergent gaps in energy justice scholarship and its application across borders of nations and ways of thinking, being critical of energy justice's own aims and origins as an arguably overly Western concept. This positions the aim of this book as one that (1) provides novel examples of comparative approaches to energy justice and (2) further considers the perspectives of non-Western ethical traditions. In executing this project, we bring together four different fields: energy policy research, the ethics of technology, energy justice scholarship and comparative philosophy. This diversity of perspectives is further reflected in the location and specialisms of the editorial and authorial team. We also aim for diversity in the range of energy technologies we consider, with contributions around nuclear, energy production, smart grids energy distribution, hydropower and even LED lighting, for example (see Table 1.1). These, in turn, represent a wide range of energy system stages.

The first part of *Energy Justice Across Borders* sets the scene by giving examples of how current energy justice applications deal with the need to cross borders and how energy ethical approaches handle energy issues in a non-Western way. Representing a core issue in global philosophy approaches, the second part then starts with engaged practices to overcome the divide between universalism, consensus and pluralism. In the third part, we explore the interplay between theory and practice, applying theoretical frameworks to energy technologies through real-world case studies. In the fourth and final part, we present chapters predominantly focusing on theoretical approaches. We do so as reflection that whilst we stress the need for theory-practice exchange in global philosophy, we do not seek to do so at the expense of contributions that entail pure theoretical development.

1.5.1 Setting the Scene

The first part of the book gives examples of energy justice investigations and their recurrence in particular settings, outlining current conceptual approaches. It begins with Chap. 2, which examines the relationship between energy policy and the values that appear in social movement mobilisations with respect to energy in the United States. Three policy case studies are discussed: net metering, smart meters and green economic development. It outlines that both challengers and incumbents link their strategic frames to broader cultural values to gain credibility in the public sphere. Both types of coalitions generally reference a similar group of widely shared values that are associated with institutional logics, but they engage in different strategies to make credible linkages between their positions and the general values and to question the linkages posed by the frames of opponents. The chapter maps out the broad value categories that appear in the framing contests, develops a typology of counterframing strategies and explores cross-cultural applicability and limitations.

Table 1.1 Overview of the volume's chapters, indicating the topic, the featured countries and the energy sub-systems discussed

#	Authors	Title	Countries or regions	Energy subsystem
2	Hess	Energy politics in the public sphere: Frames, values, and symbolic power	USA	Smart meters, green economic development
3	Duff et al.	A right way, wrong way and better way for energy engineers to work with Aboriginal communities	Australia	Energy hub, nuclear
4	Nurysheva et al.	The Kazakh ethical tradition and anti-nuclear ethics	Kazakhstan	Nuclear
5	Kruger et al.	Energy justice, hydropower and grid systems in the Global South	Democratic Republic of Congo	Hydropower
6	Govindan et al.	Gender in electricity policymaking in India, Nepal and Kenya	India, Kenya, Nepal	Energy policy
7	Terefe	Sociomaterial solar waste: Afterlives and lives after of small solar	Ethiopia, Africa	Energy policy
8	Kumar et al.	The impacts of policy on energy justice in developing countries	India	Smart grids
9	Herrington et al.	A Hindu philosophy perspective on the temporal nature of energy justice in Odisha, India	Odisha province and India	Energy policy
10	Janssens et al.	LED lighting across borders. Exploring the plea for darkness and value-sensitive design with Libbrecht's comparative philosophy model	Europe, India, China	LED lighting
11	Wang et al.	Energy justice and construction of community with a shared future for mankind	Yulin City and China	Energy production
12	Oostveen	On the concept of "energy" from a transcultural perspective	Europe, India, China	Energy concept
13	Pellegrini-Masini et al.	Energy justice and intergenerational ethics: Theoretical perspectives and institutional designs	Africa and Europe	Intergenerational energy policy
14	Sanusi et al.	Exploring marginalization and exclusion in renewable energy development in Africa: A perspective from Western individualism and African Ubuntu philosophy	Africa and Europe	Sustainable energy technologies

Chapter 3 is an exploration of the experiences of indigenous peoples and energy justice in the hypothetical case of "Warrigal Downs Energy Hub". Aboriginal Australians have an intrinsic relation to country, kinship and community. The processes related to colonisation have decimated traditional lifestyles, ecology and even families. The chapter outlines that the resultant challenge for engineers lies in the ability to reconcile energy engineering with the contemporary and traditional

needs of Aboriginal people. A discussion around Aboriginal peoples' most deeply held values is linked both to global and professional ethical canons. Writing as a team of Aboriginal and non-Aboriginal educators and engineers, they introduce a right, wrong and even better ways to work sensitively, meaningfully and reciprocally with Aboriginal people in Australia in energy hubs and nuclear non-proliferation.

Chapter 4 provides another example of an ethical approach towards nuclear non-proliferation, though from a very different context and ethical perspective. The chapter showcases the differences that exist in energy justice approaches, in this case by delivering a clear story "from within", making a strong plea for the application of Kazakh traditional ethics in energy justice. The authors outline that at different stages of history, the nature of philosophical approaches in various civilisations characterises the diversity and unity of human aspirations for peace and harmony. They argue that the development of nuclear weapons in the modern world is a serious challenge to these concepts, especially from a Kazakh perspective, further suggesting that the ethical ideas of different nations can be used as a strong argument in favour of mankind's refusal of nuclear weapons. The authors focus on the harmonious worldview of the nomadic populations, who they argue, understood the interconnectedness of the world of man and the world of nature.

Chapter 5 articulates the views that grid systems are key focal points for energy debates in the Global South. The authors explore the notion that off- and on-grid realities, with a plethora of micro-grid systems in between, exist simultaneously with differing under-explored consequences for rights, responsibilities, opportunities and constraints. They argue that a conceptualisation around macro- and micro-levels of justice help to elucidate this complexity. A comparative philosophical approach ensues through a spatial exploration of justice in relation to the Democratic Republic of Congo and the grid systems derived from hydropower. Original qualitative data is presented, analysed and reflected upon, with concluding insights into conducting energy justice in the Global South.

1.5.2   Energy Justice Across Borders in Practice

Part II explores real-world practices that overcome divides in comparative philosophy approaches. Chapter 6 states that electricity is increasingly regarded as an amenity crucial to human well-being and overall economic development. It argues it is also one that contributes to improving gender parity and social inclusion, especially in situations where women are challenged by harsh living conditions. Specifically, the chapter scrutinises how gender issues are addressed and incorporated in the electricity policies of India, Kenya and Nepal. The analyses reveal that though there is an increase in the electricity policies that reflect gender considerations, more than half of the reviewed documents are devoid of any explicit featuring of gender concerns. The authors argue this "gender-blind" approach towards the impact of access to electricity and its potential emanates from a hesitation to explicitly acknowledge the differentiated needs of women and men in creating equitable outcomes. The

chapter provides recommendations for gender inclusion in the electricity policies for successful outcomes.

Chapter 7 focuses on the issue of energy access through empirical data on Ethiopia in particular, and Africa in general. The author outlines that access to modern energy is vital to societal well-being and to economic development, yet that still the majority of rural households in developing countries do not have access to basic household energy services. Despite different policy attempts to improve access, they are often unsuccessful due to the socioeconomic, cultural, resource and technical conditions present in particular contexts. In contrast, some projects considering local social needs through innovative approaches have been successful. Hence, increasing access to improved energy technology requires an understanding of local contexts, linking to income-generating activities and poverty alleviation and the inclusion of women. The author argues that a bottom-up approach is sustainable to increase energy access whilst contributing to poverty alleviation and livelihood improvement.

Chapter 8 considers the emergent issue of solar waste from off-grid technologies. This chapter argues that solar waste represents multiple matters of concern; it is a problem of pollution, resource and "social ruin" all together. The authors suggest that whilst an energy justice framework is well suited to identifying issues of distributional, procedural and recognition justice in relation to solar waste—what they refer to as "afterlives"—there is a need to engage with postcolonial theories of ethics in order to better grapple with the different kinds of social ruins solar waste may represent—what they refer to as "lives after". The chapter concludes that combining an energy justice perspective with postcolonial analysis reveals critical, ethical analysis of both the material elements of off-grid solar infrastructure *and* the lives that come after it at a range of scales.

1.5.3   Applying Theory to Practice in Energy Justice Across Borders

Part III of our volume links theoretical understandings of energy justice and comparative philosophical thought to real-world practical action. Chapter 9 draws upon Sen's interpretation of the Hindu Bhagavad *Gita* to discuss the temporal justice implications underlying the energy transitions observed in much of the Global South. In particular, it applies this Hindu-based philosophy to unpack the energy policy dichotomy currently facing policymakers in the Indian state of Odisha: the conflict between achieving sustainable development whilst also rapidly decarbonising by transitioning away from a strong industrialisation-driven model of economic development. Drawing from the *Gita*-inspired notions of a focus on duty in the here-and-now versus a sensitivity towards future consequences of present actions, the authors introduce *Nyāya*, a Sanskrit term for justice. They argue that *Nyāya*'s focus on "realised" justice is far more comprehensive and inclusive in that it allows

policymakers to move beyond *Niti*, which limits policy to following the trappings of bounded institutions, rules and regulations.

Chapter 10 presents an exploratory opportunity to open up an exchange between value-sensitive design (VSD) and the current transition to outdoor LED lighting via Libbrecht's comparative philosophy model. Libbrecht's model describes three fundamentally different forms of thinking about and relations to the world, which are based on "immanence", "rational transcendence", and "emotional transcendence". The authors start with broadening the traditional rationale for, and analysis of, the LED lighting transition by incorporating the value of darkness. They argue that a classical VSD approach on smart LED lights risks focusing on a standard list of rational transcendence values, including control and comfort. A focus on immanence, however, brings in the "by-itself-so", whereas emotional transcendence lays emphasis on "alter-intentionality". The chapter concludes that Libbrecht's model broadens the set of values used in VSD and that this comes with non-evident choices of accepting elements from other worldviews and the need for normativity in VSD.

Chapter 11 explores Chinese philosophical ethical perspectives. Focusing mainly the Confucian thoughts on *hexie* (harmony) and *yi* (just), the *tianxia* (world) view and the reflections from the tradition of community both from the West and East, the authors link energy justice to the construction of "community with a shared future for mankind". They argue that the foundation of energy justice lies in how to construct the relationship between the subjects (both individual and collective) of justice in the community with a shared future. They do so through cases of Yulin and global carbon emissions, before pointing out that one should deal with the four major relations involved in the complete process of energy acquisition, distribution, utilisation and post-processing in order to build a just energy system. The chapter concludes with three possible strategies to deal with global issues of energy justice, that is, specific strategy, real-time strategy and holistic strategy.

1.5.4 Theoretical Approaches in Energy Justice Across Borders

Careful not to dismiss the contribution of theoretical approaches to global energy justice issues, Part IV presents three largely conceptual contributions. Chapter 12 theoretically elaborates on the concept *energy* from a transcultural perspective. Often, energy is only approached by means of the stipulated definition, as used in science. The chapter argues that this usage disregards the specific philosophical origins of the concept. It gives the example of the comparative philosophy of Libbrecht, where the concept of energy is used as a comparative category which has related concepts in each of the various ideal types of worldviews—the Greek, the Indian and the Chinese—his comparative model describes. The author suggests that by informing ourselves of particularly Buddhist and Chinese perspectives on energy and ethics, we can transform and expand our understanding of energy in order to

increase its explanatory power with regard to contemporary questions of energy justice. This includes a post-human approach towards it.

In Chap. 13, the authors discuss the temporal scope of energy justice as they tackle the question of whether future people should be considered as participants in the scheme of redistribution. In doing this, they firstly confront two prominent theories of distributive justice that have been constantly juxtaposed in the political philosophy literature. The first one is the social contract theory that they consider in the classic formulation given by Rawls, in the moral variant proposed by Scanlon and in the contractarian version devised by Gauthier. The second one is communitarianism, not simply in the Western formulation given in the literature on liberalism, but also through the lens of the African political philosophy of Ubuntu. The chapter discusses how the philosophical concerns for future beings have been translated into specific policies, with the aim of weighing the interests of present individuals against the social rights of posterity. Their analysis is based on dualism between an individualistic conception of human beings as utility maximisers and a communitarian view on human relations.

Chapter 14's contribution is to explore and compare energy marginalisation in Africa and Europe, to underscore the violation of ethics in renewable energy deployment and to find means of addressing energy injustice through the proper application of the respective ethical principles. It compares two distinct fields of philosophy, Western and Ubuntu. Applied to energy justice, the authors deduce that both philosophies look at the needs of people, claim that it is morally imperative to overcome energy poverty and to allow equal access to opportunity, both for current and future people. Yet the authors see differences as well. They outline, for instance, that the Western "nature as resource" view needs to be overcome since one can argue that it rests on a problematic metaphysics of nature and may stand in the way of further developing an environmental ethics that goes beyond anthropocentric conceptions. This reflects a comparative discussion on which ethical approach carries the most explanatory and analytical power, and which defines clear needs in future research.

1.6   Conclusions

The chapters in this book each make an attempt at exploring how different ethical systems can add to our understanding of what energy justice is and how we embed it into energy policy at the local and the global level. The collection therefore provides insights into the key aspects of ethical systems for global energy justice, their contribution to evaluating energy systems across borders and the role of theoretical elaborations in contributing to changes in energy policy practices. In particular, our global philosophy approach urges for the combination of practices and theories across various borders at various scales. It pushes us to study practices, analyse the interaction between practices and theory and elaborate on theories that answer practical needs, for instance. It also analyses and supports the interaction

between the local, regional and global scales thinking, policies and energy technologies. Through such a contribution, we hope that our volume adds the first global philosophy approach to energy justice that challenges scholarship, policy and practice.

This volume's target is large, thus it should be no surprise that it is not comprehensively achieved. First of all, although we aimed at a wide list of philosophies, our list is far from exhaustive. The volume gives voice to perspectives from Africa, the Americas, Asia, Australia and Europe, and yet many philosophies are lacking. Within Asian philosophy, for example, we discuss Indian, Kazakh and Chinese philosophies, but not Japanese or Persian, for instance. Further, some theistic philosophies such as those based on Islam or Christianity are not present. As such, whilst we present a volume with a wide range of ancient and present-day philosophies that contribute to energy justice, there is room for enlargement.

Secondly, comparative philosophers might argue that there is insufficient in-depth comparative philosophy in this volume. We acknowledge that the focus of this volume is not on in-depth, highly specialised discussions of discipline-specific issues, although we do present comparative chapters on the concept of energy. Instead, we stress the interplay between application and theory since we believe that the important challenge for a global philosophy approach is to bridge the gap between universalists who optimise the communication across boundaries and pluralists who optimise in acknowledging the uniqueness and richness of every approach. Global philosophers may wish to expand this application.

Third, we see great value in policy research and ethics of technology studies that take the entire energy chain into account and follow a system approach. We are aware that our examples and empirical materials are fragmented. Although we talk about mining, energy production, energy distribution and energy wastes and afterlives, for instance, we do so in reference to different energy technologies. In this regard, the volume does not give a clear system perspective, but does present the building blocks for later systems-wide applications. It follows that to close the emergent research gap, studies should engage in "source-to-sink" comparative philosophy studies of energy justice issues.

Fourth, we indicated earlier that a key challenge for global approaches to energy justice approach is the Western origin of the term "justice" itself. Tan's (2015) analysis does locate a common element in the Confucian concept *yi* and the Western concept of just, meaning both "to treat like cases alike and treat different cases differently"; yet at the same time, she makes very clear that the concept of *justice* focuses on distributive question to have, take or accept things, whereas the core in the concept of *yi* is that a gift invokes an ethically appropriate relationship between the giver and the recipient. It cannot and should not be denied that justice is a much more Western concept. However, global energy justice can and should support both energy policymakers and scholars to take the common meaning as a starting point and to engage in and elaborate on the dialectical adaptation of justice, *yi* and other concepts.

Following on from above, it will not be sufficient to focus on the concept of "justice". Comparative philosophy must be open to other linked, often overlapping,

concepts, including "energy", "democracy", "responsibility", "community", "truth", "knowledge", "emotion" and so forth. From these ideas, we might ask the following questions: How do different ethical systems lead to different ways of giving meaning to these relevant concepts? How can these different meanings be used in a situation that unites the different ethical systems? How can comparative philosophy support this mutual engagement? How can a balance be found between the sense of urgency in sustainability transitions on the one hand and the need for philosophical in-depth analysis mandated by the above questions?

Finally, a global, comparative approach to energy justice is not just one that should be discussed but *applied.* Energy justice should support initiatives that include local, regional and global values to energy policy. It should be critical to its own aims of energy *justice* as a potentially *too Western* concept. It should actively engage in dialectical adaptation, together with comparative philosophy, in finding new approaches to energy innovation. Through this recommendation, all of the above and all those in each chapter, we hope *Energy Justice Across Borders* will add to the need in energy justice scholarship and practice across borders of nations, borders of ways of thinking and borders of disciplines.

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Chapter 2
Energy Politics in the Public Sphere: Frames, Values, and Symbolic Power

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Abstract The study examines the relationship between energy policy and values that appears in social movement mobilizations with respect to energy in the United States. As the social movement mobilizations include persons and groups located in disadvantaged or subordinate positions of the social structure, the analysis of social movements and values can bring out the linkages between structural inequality and values. Three policy fields are discussed: net metering, smart meters, and green economic development. Both challengers and incumbents link their strategic frames to broader cultural values to gain credibility in the public sphere. Both types of coalitions generally reference a similar group of widely shared values that are associated with institutional logics, but they engage in different strategies to make credible the linkages between their positions and the general values and to question the linkages posed by the frames of opponents. The study maps out the broad value categories that appear in the framing contests, develops a typology of counterframing strategies, and explores cross-cultural applicability and limitations.

2.1 Introduction

Energy systems, like other large technological systems, may first appear to be designed based on technical criteria such as functionality and efficiency, but the systems also involve design choices that can cause technical criteria to become interwoven with intense political conflicts. As the opponents in the conflicts attempt to change or maintain the configuration of energy systems, they bring their debates into the public sphere. By linking the frames they use to support their positions with widely held cultural values, actors can show how their positions are aligned with the broader public interest and do not merely represent the self-interested views of a "special interest" group. Thus, the referencing of broad cultural values, both implicitly and explicitly, is part of the struggle for symbolic power in the political field

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(Bourdieu 1991). As various actors attempt to show how their positions best align with the public interest, they attempt to gain credibility to influence public opinion, policy outcomes, and the design of the technological systems.

This study is a contribution to the analysis of values in energy politics based on a comparative analysis of cases of energy politics in the United States. In the study of values and energy politics, two main approaches can be distinguished: evaluative and explanatory. The evaluative approach articulates a set of value-based principles that can be used to analyze energy policies and programs. For example, this approach might develop a set of guidelines based on cosmopolitan concepts of distributive and procedural justice that enable an analyst to define basic features of a just energy system. Having articulated this set of principles, the analyst can then evaluate the energy policies and programs in different times and places to show how well they stack up against the yardstick principles, and the analyst can make suggestions about how the policies or programs could be improved to make them "better."

The evaluative approach can be found in philosophy-informed research and sometimes in the policy-oriented disciplines (Fischer 1995). Although the evaluative approach provides a clear basis for suggesting improvements to existing energy systems, it faces the challenge of justifying the principles upon which the evaluation is based—that is, the grounds for the ethical principles used as the yardstick and why anyone should agree with one set of principles over another. One solution is to begin with the values accepted in the local policy context and evaluate policies against those values, but local values are often contested. Another solution is to use a philosophically derived set of values based on cosmopolitan principles such as democracy and justice, but understandings of these principles may vary cross-culturally, and other values may also appear as more salient or important.

The alternative "explanatory" approach, and the one used in this chapter, is based on a long tradition of research in the social sciences, dating back at least to Weber (1978) and Durkheim (1965), that defines a different type of analytical enterprise from that of evaluating policies and programs. Rather, the goal is to view values as "social facts" that can be described by social scientists using specified methods. In this sense, values are patterns found in orientations to action that exist in the minds of social actors and that are shared to some degree in collective entities. Values are "models for" action that can be described through qualitative research, and they can be used to help explain the action of individuals and collective entities.

As with the evaluative approach, the explanatory approach has disadvantages and advantages. The disadvantage is that the approach brackets the often important question of evaluation of which energy choices are better or worse. Because the approach is restricted to "is" rather than "ought" questions, at best the approach can offer scenarios of the implications of different policy choices. The advantage is that because the researcher is not engaged in the evaluation of local practices (or the research at least cordons off this exercise as a separate endeavor), the problem of whether opposing sides in a policy conflict agree with the analysis is also avoided. The researcher justifies the choice of values in the context of a research community where alternative explanations are vetted, including explanations that reference other values and explanations that focus on structural conditions or other factors rather than values.

In summary, the term "values" may create cross-disciplinary misunderstandings in the context of interdisciplinary research on energy, ethics, values, and justice. An evaluative approach to energy politics that is based on philosophical principles will have a very different idea of what "values" are in comparison with an explanatory approach that is based on social theory and social science. This study will adopt the latter approach to develop an analysis of frames, values, and energy politics, but it will also explore the problem of cross-cultural limitations of explanatory approaches and the implications of explanation for evaluation.

2.2 Theoretical Background

Within the explanatory approach, one can distinguish two main traditions. The nomothetic approach (common in sociology, political science, economics, and social psychology) attempts to build general explanatory theories about causal mechanisms that can be applied across a range of social contexts, such as a theory of political revolutions or a theory of marital preferences. These explanations are generally delimited institutionally (for the state or other institutional sector), temporally (for a specified time period), spatially (for urban systems or international systems), and culturally (for Western democracies, for authoritarian capitalism, for Latin America, etc.). In contrast, cultural anthropology and history tend to adopt an idiographic mode of explanation that focuses on the multiple causes of specific events or practices, such as the French revolution or changes in marital preferences in rural Algeria. Idiographic approaches can be brought together in comparative research that can then generate higher-level nomothetic theories. In most cases, these theories are of the middle range and do not aspire to be applicable across all human societies.

Values are one of the many resources available for explanations of either type. Researchers influenced by the meaning-oriented tradition of Weber (1978) and cultural anthropology (Geertz 1973) view values as part of symbolic or cultural systems that provide models of and for social action. In other words, cultural systems include both cognitive maps that describe the social and natural world and normative maps of how best to handle situations in the world. The normative side is usually parsed into two subcategories: values, or general principles for action ("we value human lives"), and norms, or articulations of values that serve as guidelines for action ("our laws punish murder heavily" and "our laws include strong safety regulations"). Norms are usually backed by a system of rewards and sanctions that can be formally coded in the legal system. Cognitive and normative categories may be understood consciously by the people who use them, or they may be hidden from view, implicit, or even unconscious and thus only evident when analyzed by a social scientist. For example, the normative categories may be implicitly utilized in everyday practices, rarely acknowledged, and only made explicit when they are breached, but they can also become codified as laws, regulations, standards, political or occupational ideologies, theologies, or ethical systems. In this sense, they structure

action in a way similar to that of a grammar for speech. In this context, the concept of ethics is understood as a formal codification of a network of norms and values, usually applied to a specific domain of social life. For example, many professional societies have ethical codes.

Both the cognitive and normative categories can be analyzed with some precision using the methods of semiotics and structural linguistics (e.g., Lévi-Strauss 1974). The semiotic approach focuses on the role of the codes as instruments of communication and, when shared across a community, of social integration. In addition to this method, a second perspective embeds the semiotic analysis of symbolic codes in social relations to show how they also serve as instruments of symbolic power (Bourdieu 1991; Wacquant and Akçaoğlu 2017). Understood as a world-making capacity to generate, maintain, and change codes, symbolic power is exercised by actors in a wide range of social sectors, including advertising, artistic creation, scientific knowledge, technological innovation, educational instruction, and religious cosmology and ethics. The diversity of sources of symbolic power generates multiple codes, and the state serves as the evaluator and arbiter of differences. For example, as Bourdieu (1991) argued in his analysis of the making of the French language, the state intervened to produce a standardized national language that in some regions displaced the local dialects, and in other regions it imposed a linguistic hierarchy on bilingualism. More generally, the development of standards, laws, and ethical codes, either through the state or through private governance mechanisms, involves the exercise of symbolic power through the hierarchical ordering of codes and practices.

To resolve conflicts among codes, the state can utilize deliberative processes that enable the vetting of differing viewpoints. But alongside deliberation in the various sites afforded by the state (parliaments, regulatory hearings, judicial processes, and so on), deliberation also takes place in the broader public sphere, which is understood here as a social field of public debate, both cognitive and normative, about social issues, problems, and solutions where the stakes are favorable public opinion for a position. Although the debate and deliberation that contributes to the shaping of public opinion can be unmediated and face-to-face, as in dinner conversations and small meetings about appropriate energy policies, to attain broad political influence over public opinion it must be disseminated through the media. Thus, contestation in the public sphere is, for the most part, a mediated struggle for legitimate definitions of problems and their solutions.

To gain legitimacy and support in the public sphere, it is important not to present one's position as merely defending a narrow personal, organizational, or even sectional interest. Instead, actors in the public sphere attempt to gain legitimacy by representing their positions as aligned with a broad public interest. In doing so, they make references to widely shared values as part of their framing strategy. In turn, opponents may attempt to unmask their opponents by revealing their positions to be hiding self-interest or at least covertly aligned with it. But if an actor or coalition of actors is successful in making a position appear to be coherently aligned with shared values and beliefs, it can achieve broad credibility and have influence on public opinion and public policy. Thus, the alignment of positions in the public sphere with

general values involves the paradoxical interest in disinterest, that is, the interest in producing a position that is aligned with a general public interest rather than a private or sectional interest (Bourdieu 1991). One way of achieving this appearance of disinterest is to frame one's position in reference to widely held values and generally accepted knowledge.

2.3 Values, Frames, and the Politics of Energy

There are various approaches to the categorization of values. In idiographic explanations, researchers who adopt cultural methods tend to begin with emic categorizations, that is, the values articulated in discourse or implied in practices. With nomothetic explanations, comparative work generally tends to subsume local categorizations in etic categories of value types, that is, general categories developed by social scientists. For example, Weber (1978) and Parsons (1977) were concerned with the problem of modernity and tended to draw attention to the changes in institutions that involved a shift from particularistic values (those based on loyalties to social groups) to universalistic values (those based on general principles that are applied to all citizens; see also Dumont 1970, 1977). In energy studies, most discussions of justice are based on a universalistic conceptualization of justice (equal justice for all) rather than a particularistic one (different standards for more and less privileged social groups). Social scientists can then show how institutions involve mixtures of universalistic and particularistic practices, such as racial prejudice in the criminal justice system. By showing how social practices are aligned with particularistic values, social scientists can explain and document causal pathways (e.g., the effects of differential criminal justice treatment on incarceration rates) and point to the evaluative question of how to improve a social institution.

   For the present purposes of studying the relationship between values and energy politics within a modern, Western society, the broad categorizations of values associated with the study of modern and traditional societies are not as helpful as an approach that is drawn from the institutional logics literature (e.g., Thornton et al. 2011). This approach characterizes cultural logics and associated value orientations for different institutional sectors in modern societies. For the empirical material that will be analyzed here, the most relevant institutional sectors are the state, the household (or family), the economy, and political civil society because these sectors include actors who become mobilized into coalitions that involve different viewpoints on energy politics. The main values associated with the "institutional logics" of these different sectors for the empirical project described below—energy politics in the contemporary United States—are described in Table 2.1. This table adopts an approach that treats frames as explicit ways of categorizing policies (emic categories) that can be located in discourse and values as groupings of frames based on categories developed by the social scientist (etic categories). Frames sometimes map to more than one value group, and examples will be discussed below.

   The issue of how applicable this set of values is to other cases in the study of energy, values, and politics is an empirical question. The categories are likely to

Table 2.1 Institutional sectors with an associated orienting value and associated frames

Institutional sector	Orienting value	Associated frames for energy politics identified in the case studies
The state	Good government	Democratic decision-making for policies, local control over electricity, proper government spending, protection of property rights
The economy	Sound economy	Job creation (green jobs), job loss (threat to jobs), marketplace competition, economic development
The family or household	Consumer protection	Energy affordability, energy reliability, fairness in pricing, privacy, security
Political civil society	Environmental sustainability	Pollution reduction, greenhouse-gas emissions reductions, environmental risk and safety

have some general applicability across different regions of the world and different policy fields because they are linked to broad institutional logics that are found in many modern societies. However, other institutional logics may be more prevalent in other countries, such as a religious logic in countries where religion is an important part of public sphere debate for the policy issue in question. Moreover, even similar institutional logics (such as logic based on the value of good government) will likely take on specific meanings in local frames, and the same institutional sector (e.g., the state, the family) may highlight very different institutional logics and associated values. These issues must be addressed through comparative research with an empirical problem in mind and are beyond the scope of the present analysis. The discussion section will provide some indications of what kinds of insights comparative research might provide.

Values are articulated, either explicitly or implicitly, in the framing contests of coalitions of opponents as they defend different visions of energy policy in the public sphere. The competing coalitions are networks of actors with unequal power in society. Two sets of terms are used to describe these different positions of power: incumbents and challengers in a social field, and dominant and subordinate positions in the social structure. In the energy sector, industrial incumbents are generally large organizations such as utilities that form alliances with government officials in the economic ministries and on the political right. In contrast, challengers advocate for new technologies and new organizational forms such as distributed renewable energy and community-controlled electricity, often in coalitions with environmentalists and government officials connected with environmental ministries and the political left. The second distinction is between positions in the social structure, that is, the pervasive system of inequality by race, class, gender, and other social differences. To avoid delegitimation as representing a sectional interest of the elites (e.g., wealthy owners of utilities or middle-class environmentalists), both incumbents and challengers will articulate frames that appeal to people and groups in subordinate positions. These frames can include energy affordability, fair pricing, good jobs, and air quality. More generally, in order to attract supporters to a policy position, coalitions will use frames that are designed to resonate with the beliefs and values of potential supporters.

The term "frames" was originally developed by Bateson (1955), an anthropologist who described a meta level of communication that indicates to actors what kind of game they are in (such as cooperation or conflict) and that provides a lens through which actors can interpret the actions of others. Goffman (1974: 21) developed the analysis of frames as "schemata of interpretation," and Benford and Snow (2000: 614) introduced the more specific category of "collective action frames," which are "action-oriented sets of beliefs and meanings that inspire and legitimate the activities and campaigns of a social movement organization (SMO)." Snow et al. (1986) drew attention to the processes of framing and frame alignment, which include specifiable processes such as bridging ideologically congruent frames, amplifying values and beliefs, extending the boundaries of the primary frame to accommodate new adherents, and transforming the frame through redefinition in terms of another frame.

The analysis of framing processes has indicated the importance of values as elements of frames and framing processes. For example, Snow et al. (1986) noted that when activists and advocates amplify frames, they may select values and beliefs that are consistent with those of potential adherents. Likewise, the extension of frames may involve introducing new values into a frame, and the transformation of a frame may involve jettisoning all or some of the values of an existing frame. More generally, activists also draw on the values and beliefs articulated in the cultural codes around them. They may perceive and articulate the general values through the lenses of the relatively durable, stable systems of ideology, which can provide toolkits for constructing frames (Snow and Benford 2000), but ideology is not the only source of inspiration for values. For example, advocates may also draw on deeply and widely understood cultural repertoires of action (Hess 2007).

Although the analysis that follows focuses mainly on values, it assumes that frames also include a cognitive aspect such as the mobilization of widely held beliefs and the linking of beliefs to credible and independent sources of belief such as scientific research or religious doctrine. However, the articulations with widely held cultural beliefs are only discussed tangentially in the analysis that follows, partly because the most widely held beliefs tend to be bundled with widely held values, and partly because the focus of this study is on values and energy.

Values are valuable to frames not only because they serve as general principles behind the "models for action" but also because they can legitimate the frame in the eyes of actual and potential supporters and against detractors. But values are not unstructured like a bag of marbles or the jumble of tools in the back of the truck of a jack-of-all-trades. Rather, when actors make reference to widely held beliefs and values, they are engaging the "discursive opportunity structure" (McCammon 2013). In the field of the public sphere, some values and beliefs are more widely accepted than others. In the credibility battles for public opinion and policy influence, actors must attend to the shifting contours of the valuation of values or, as Ferree (2003) describes it, to the gradient of discursive opportunities. For example, in the cases described below, the polarization of American politics on climate change has made it more difficult for energy-transition advocates to reference the value of environmental sustainability and arguably easier to reference the value of

consumer protection. Thus, the gradient of discursive opportunities, and changes in the gradient over time and across social space, limit the resonance of a frame, including its credibility for the defense of a particular configuration of values that become aligned with a frame. But the decision to pursue resonance or congruence with the discursive opportunity structure remains a choice.

In addition to congruence with the discursive opportunity structure or general cultural repertoires, the selection of frames and associated values is also shaped by the dialogical process of countering and responding to other frames, a point that is developed in some of the studies in the counterframing literature (Esacove 2004; Gallo-Cruz 2012; Steinberg 1999). Thus, the cases that follow do not focus just on the collective action frames of energy-transition coalitions or on a single process of developing and modifying a frame; rather, the cases also examine the framing action of mobilized networks of both challengers and incumbents. The analysis is processual so that one can see how the values are mobilized and interpreted in a series of moves and countermoves. The processual approach shows how the construction of a frame is a relational activity, especially with reference to the counterframes of opponents and the frames of allies or potential allies. In the research described below, five basic selection processes are identified:

- Refusal. In response to an opponent's frames and values, an actor may refuse to engage or otherwise ignore the opponent, usually by reasserting or introducing other frames and values.
- Introduction. In response to an opponent's frame and value, an actor may introduce a completely new value and associated frame or frames.
- Substitution. In response to an opponent's frame, an actor may accept the broader value associated with the frame but deploy a different frame to show how the actor's position also is consistent with the general value.
- Reassertion. In responses to an opponent's frame, an actor may rearticulate or double down on the actor's existing frame.
- Refraction. In response to an opponent's frames, an actor may accept the value and framing configuration of the opponent but show how the actor's position better meets the framing than does that of the opponent.

One might liken the relational approach to framing and values to a game in which two composers, or two coalitions of composers, compete in a public venue to gain an audience for their music. The frames are the specific compositions of music that they perform, but the compositions in turn reference broader genres of music (akin to the values) that may resonate more or less with different audiences and that are also in response to the compositions and genres selected by the opponents.

2.4 Case Studies

Three cases—net metering, smart meters, and green economic development—are examined based on research projects conducted by the author and his students in the United States. All three cases involve conflicts between incumbent and challenger

coalitions with different framings of their policy positions. The analysis summarizes frames that appear in defense of the opposing policy positions, the values associated with the frames, and the play of the processes of counterframing (refusal, introduction, substitution, reassertion, and refraction). The values are indicated in italics, and the counterframing processes are in boldface.

2.4.1 Net Metering

Net metering is a policy in which the utility pays the owner of distributed energy resources for the production of small-scale photovoltaic or wind energy by funding the net value of the price of the energy provided to the grid minus the price of the energy provided from the grid. The payment structure can vary but frequently is at a rate equivalent to the retail price of electricity. Similar to a feed-in tariff, net metering establishes a stable revenue stream for solar or other renewable-energy installations that enables the calculation of time-to-payback and a predictable return on investment. The policy can also be combined with tax credits and other government incentives.

The first net metering and renewable portfolio standards laws were enacted in the early 1980s, and both diffused over the following decades to other states. By 2018, nearly all of the states had adopted net metering, and more than half had a mandatory renewable portfolio standard, some of which included a "carve out" provision that designated solar energy as a mandatory part of the renewable requirement. Although the first net metering law was enacted in Minnesota, credit for the first net metering installation in the United States has gone to Steven Strong, a solar-oriented architect in the northeastern state of Massachusetts who designed two buildings with solar panels in 1979 (Johnstone 2010). The meters on the building ran backward when the building fed electricity into the grid. President Jimmy Carter accepted an invitation to attend the launch of the project, but at the last minute he sent Denis Hayes of the Solar Energy Research Institute. Local political leaders also attended the launch and praised the project.

At the time the utility industry was based on a technological regime of baseload power produced in centralized facilities such as fossil-fuel power plants, hydroelectric generation facilities, and nuclear reactors. The utilities **introduced** the value of *consumer protection* with the frames of affordability and electricity reliability, which they used to defend the regime of baseload power with centralized fossil-fuel generation. In contrast, advocates like Strong and Hayes, who organized the first Earth Day event, supported net metering as part of a long-term energy-transition goal to renewable energy. For example, Hayes's 1977 book, *Rays of Hope: The Transition to a Post-Petroleum World*, described the need for "energy transition" to renewable forms of energy. The book **refracted** the frame of reliability by pointing to the risks posed by the 1973 oil embargo and the rise of petroleum prices, therefore suggesting that renewable energy was a better long-term pathway to energy reliability. At the time electricity generation also included petroleum, thus placing

both electricity and transportation at risk from global disruptions that followed from the 1973 oil crisis. President Carter, who supported the development of renewable energy, also linked the future energy transition to long-term reliability that could be achieved with energy independence. But Hayes's book also largely **refused** to engage the affordability framing, partly because renewable energy at that time was quite expensive relative to fossil fuels. Instead, Hayes and other solar advocates **introduced** the new values of *environmental sustainability* and *good government* with the frames of democratic local governance of and control over renewable energy (Laird 2001; Reece 1979). These values could also appeal to elements of their coalition that included environmentalists and progressives who were building local democratic institutions.

In the case of the inauguration ceremony for the two buildings in Massachusetts, the local utility welcomed the development of distributed solar energy, partly because of the support that the inaugural event was receiving from the state and national government and partly because the event helped to counteract bad publicity that the utility had been receiving regarding a nuclear energy power plant, which had become associated with cost overruns and potential environmental risk (Johnstone 2010). Thus, the utility was battling negative framings of lack of affordability and safety that cast them in a bad light with respect to the values of *consumer protection* and *environmental sustainability*. However, in general utilities were skeptical of the electricity from the small-scale sites, which they labelled "dirty electricity" and argued would result in a threat to reliability (ibid.). By using the reliability frame (their ability to provide reliable electricity to consumers) rather than the affordability frame, the utilities **reasserted** their alignment with the value of *consumer protection*. They also **refracted** the reliability counterframing of the renewable-energy advocates (the lack of reliability due to the reliance on foreign oil) by pointing to the potential threat to the grid's reliability from the "dirty electricity" associated with distributed solar energy. Yet, the scale of solarization remained small, and the threat to grid reliability could not be raised credibly. Moreover, with solar in a small and contained niche, and with the centralized, baseload power configuration of the electricity regime in place, the utilities could **refuse** to engage the alternative values of *environmental sustainability* and *good government* associated with the frames of the need for an energy transition and the benefits of local control and ownership.

From the 1980s to the 2010s, the diffusion of net metering and interconnection laws across the state governments, as well as related policy innovations such as renewable portfolio standards with solar carve-outs, created a favorable policy environment for the gradual growth of rooftop photovoltaics. By the 2010s, the development of distributed-generation solar had reached a point that utilities had become concerned with the potential threat that it posed to the electricity regime—that is, a threat much broader than the original concern with dirty electricity. Some documents even suggested that the utility industry saw the development of distributive energy resources as an existential threat akin to the development of wireless communication and the demise of landlines in the telecommunications industry (Hess 2016). Growth had occurred because of a confluence of developments, including the

gradual development of the solar installation industry and the steady decline in the price of solar energy and of on-site energy storage. Moreover, the development of third-party ownership and other financing arrangements provided support for small-scale, rooftop solar based on investment by the financial and technology sectors, which represented countervailing industrial power to the utility industry.

In some areas of the country, notably Hawaii, distributed solar energy generation grew so rapidly that the utility forcefully **reasserted** the value of *consumer protection* and the frame of reliability by implementing a unilateral moratorium on new solar installations. Across the country, the utilities began a campaign to wind down or end supportive solar energy policies, including net metering (Hess 2016). They tested multiple strategies, among which the most pervasive were the establishment of high interconnection fees for distributed solar customers, attempts to end or control the third-party solar market, and the renegotiation of the retail payment structure with a value-of-solar tariff arrangement. Thus, the utilities argued that reliability was threatened by changing circumstances. The growth of solar posed significant challenges to a grid that was not designed for two-way traffic of electricity with high levels of distributed generation. In some cases, the energy flowing into the grid from neighborhoods was greater than the electricity being consumed. Substations were not equipped to handle the load, and there were risks to the equipment and to workers. More generally, the growth of solar had presented substantial challenges of load management such as the "duck curve" of recovery from high levels of solar generation during the afternoon.

Because the time to payback for rooftop solar had declined significantly since the first conflicts of the 1970s, the utilities were less able to make reference to the affordability frame. Instead, they **substituted** a new frame, fairness in pricing, in alignment with the value of *consumer protection*. The utilities argued that when solar customers enjoyed the grid services at a low rate because of the subsidy that net metering represented, the cost burden of serving distributed solar energy customers was being shifted to non-solar customers, who in effect were paying a transfer tax to the solar customers. Thus, there was a lack of fairness for non-solar customers, who tended to reside disproportionately in apartment buildings or condominiums that did not offer solarization or otherwise did not have the resources to purchase solar. Here, the utilities were able to shift the framing of the *consumer protection* value to point to distributive justice concerns that potentially facilitated support from low- and middle-income (LMI) households, which in the United States tend to be disproportionately associated with racial and ethnic minority groups in subordinate positions in the social structure.

Solar advocates responded partially by **substituting** a new frame. Maintaining their alignment with the same *consumer protection* value, they emphasized the frame of reliability rather than fair pricing. Solar advocates argued that the centralized baseload model was antiquated and that new features of electricity production—among them distributed energy, microgrids, and two-way transactions through the smart grid—could enhance reliability. With respect to the fair pricing frame, solar advocates **refracted** the frame by providing technical analyses of the full value of solar to the grid that occurs because utilities can avoid new construction

of power plants, power lines, and other grid services. Solar advocates argued that the utilities did not include such considerations in their analyses of cost burdens and transfers from solar to non-solar customers. Solar advocates also argued that solar energy presented a net gain to the utilities rather than a loss and thus did not constitute an excessive cost burden or a transfer from LMI customers to middle-class solar customers. The new calculations of the value of solar to the grid became the basis for new arrangements and compromises with utilities that replaced net metering with a more complicated basis for calculating payments.

Solar advocates also called for rights to solar for everyone through innovations such as support programs for LMI solarization and, for people who could not have solar on their rooftops, the rights of access to community-based solar shares programs. Thus, they **reasserted** the frames of local control and ownership that had been part of solar advocacy since the 1970s. In the more progressive states such as New York, solar advocates also built alliances with political progressives, labor unions, anti-fracking organizations, and LMI groups to link solar development to alliances that came together under the frame of "energy democracy" (Hess 2018). Some political leaders, notably in New York, responded with a call for grid modernization and support for community solar (ibid.).

In the more conservative states, solar advocates tended to respond to the fair pricing argument of the utilities by **substituting** the new frame of "solar choice" as a new approach to the value of *good government*. This approach linked solarization to the value of property rights and the lack of fairness to property owners, who were being denied the right to put solar panels on their rooftops. This approach was particularly important in areas where the value of *environmental sustainability* had lost legitimacy in public opinion due to the rise of conservative populism and also where support for LMI solarization might be rejected as a welfare-state handout. Solar advocates attracted political leaders such as Barry Goldwater, Jr., a former Congressman and the son of the famous conservative presidential candidate. Goldwater, Jr., invoked a property rights frame and a conservative understanding of the value of *good government* by arguing that the right to put solar on one's roof should be protected (Hess and Brown 2017). Likewise, in the state of Georgia solar advocates found support from the local Tea Party in their efforts to gain support for third-party ownership for the state, again depicted as a right to have access to solar (ibid.).

In summary, this analysis shows how the value conflicts over *consumer protection* were central as various frames were contested between advocates of distributed solar energy and the utilities. Advocates introduced additional frames associated with the values of *good government* (local democracy, rights of property owners) and *environmental sustainability* (greenhouse-gas emissions and pollution reductions), but the utilities largely refused to engage these values and associated frames. However, they did develop a new frame of fairness in pricing, which brought a distributive justice consideration into the group of *consumer protection* frames, which solar advocates met with a group of frames that were adapted to more progressive and more conservative local political cultures (e.g., energy democracy and property rights).

2.4.2   Smart Meters

By the 2010s state governments in the United States, like governments in other countries, were initiating policies to support the development of the smart grid, which involved a technological transition to greater reliance on digital technologies, two-way interactions, and energy transactions. Although utilities resisted the integration of distributed energy such as rooftop solar, the transition to smart-grid technologies provided other advantages. Among the benefits to utilities were the potential to implement time-of-day pricing and demand management, savings in labor costs from remote meter reading, and an improved capacity to integrate distributed energy resources where required by government mandates. Technology companies also welcomed these developments because they could help to enable the "Internet of things," where appliances inside a home or workspace could become connected with the Internet.

In the public relations campaigns funded by governments, utilities, and in some cases smart-grid companies, the introduction of the smart grid was associated with diverse framings. With respect to the value of *consumer protection*, the promise was that the new technology would result in lower prices due to higher efficiencies, greater reliability in the event of power losses, and fairness in pricing because consumers who used the most expensive energy (at periods of peak load) would be charged more. Likewise, with respect to the value of *environmental sustainability*, the new technology promised increases in energy efficiency and the capacity to utilize distributed renewable energy, both of which would reduce greenhouse-gas emissions as well as local fossil-fuel pollution.

The consumer interface of the smart grid is the smart meter, which the utilities presented as a minor technological change that occurs when they swap out an old analog meter for a digital meter. The process could take only a few minutes, and in many cases homeowners were not aware that the switch had taken place. However, in several countries anti-smart meter mobilizations occurred. In the United States and Canada, there were mobilizations to place a moratorium on smart meter installations until public concerns could be addressed, and when these mobilizations failed, groups sought the right to opt out to retain their analog meters. In the United States, there were grassroots mobilizations of groups that sought resolutions from local governments to end smart meters and that also participated in hearings before state governments. The opposition groups obtained some support from public health scientists, privacy organizations, and EMF risk and remediation organizations that had emerged in response to health risks associated with other types of electrosmog issues (Hess and Sudibjo 2020). Although the wireless industry rejected scientific research on the health risks of microwave technology, there has been mounting literature on the health risks associated with wireless transmissions of a similar frequency to that of smart meters, such as wireless routers and mobile phones (BioInitiative Working Group et al. 2012).

Research on anti-smart meter mobilizations indicates that the frames vary geographically and by technology (Hess 2014; Hess and Coley 2014). For example, in

the UK and Australia, affordable pricing frames were salient (Hess 2014; Sovacool et al. 2017, 2018), whereas in the Netherlands privacy was a central concern during the early roll-out of smart meters (Cuijpers and Koops 2012). In the United States, privacy was generally the second most frequent framing of opposition (after health risks) because people were concerned with how each appliance's electronic signature could allow the utility to know when people are home and what they are doing in the home (Hess 2014; Hess and Coley 2014). Privacy concerns were sometimes linked to security, which involved the potential for hackers and thieves to know when people were at home. In the United States, there was also some concern with fairness in pricing because time-of-day pricing may be less available to LMI households that do not have programmable appliances or that have work schedules that do not allow them to take advantage of discounted times. Thus, these frames maintained the value of *consumer protection* also seen in the utility and smart-grid company public relations campaigns, but they **refracted** the frame of affordability by arguing that smart meters may not provide the promised affordability and fairness in pricing, and they **substituted** the frames of privacy and security as new types of consumer concerns.

In addition to articulating the value of *consumer protection*, the anti-smart meter groups also supported the value of *environmental sustainability*, and again they **refracted** the framing of the utilities and the smart-grid companies, which had focused on energy efficiency frames. In the United States, the health risk frame was often the most frequently articulated frame, and public testimony indicated widespread concern with the potential health effects of constant, non-thermal microwave radiation exposure (Hess and Coley 2014). The risks were also potentially distributed unevenly, with higher risks for people in apartment buildings whose living quarters were directly next to a meter bank and for people who used pacemakers. Thus, without rejecting the frames of energy efficiency and reduced greenhouse-gas emissions, opponents pointed to an alternative framing of the value of environmental sustainability where the smart meter roll-out was posing a potential environmental health risk.

These controversies slowed the implementation of smart meters in some areas of the country, and in North America several states and provinces adopted opt-out rules that allowed the most vociferous critics to have a non-wireless or analog meter for an additional fee. For those concerned with health risks, the option was not very helpful unless neighbors also opted out. In general, the utilities **refused** to engage the public concerns on a number of issues: lack of meter accuracy and exorbitant pricing, social fairness associated with time-of-day pricing, and privacy concerns (Hess and Sudibjo 2020).

In this set of policy conflicts, *consumer protection* and *environmental sustainability* values were most evident, but there were new frames that articulated these values, among them privacy, security, and electrosmog health risks. In some cases the value of *good government* appeared when opponents expressed disappointment with the failure of state governments to respond to calls for a moratorium on smart meter installations, but in our analysis of statements by opponents of smart meters these frames were not as salient as health, privacy, security, and affordability.

2.4.3 Green Economic Development

Whereas the first two cases involve conflicts within an industry (electricity) over the politics of transitions (solarization and grid modernization), the third case involves a broader conflict between a coalition of conservative political leaders aligned with the fossil-fuel sector and a coalition of progressive leaders aligned with environmentalists, the clean-energy sector, and LMI groups. In the United States, the latter coalition tended to develop the international frame of "sustainable development" with its links to the values of *environmental sustainability* and *sound economy*. In other words, economic development, including job creation, can be made compatible with environmental progress, provided that there is sufficient government direction of the economy.

In contrast, in the U.S. political conservatives have frequently questioned the convergence of the values and argued instead that environmental regulation poses a threat to job creation. This "threat to jobs" frame points to potential for job loss in the fossil-fuel sector and harm to the general economy as a result of higher regulatory costs and lack of economic growth and global competitiveness. This framing is accompanied by the attempt to break down the alliance between labor and political progressives by bringing some portions of the labor unions over to the side of industry, that is, to put aside class divisions in favor of the broader goal of protecting jobs.

In the United States, a version of the sustainable development frame is "green jobs," which originally was pioneered by the Sierra Club and the United Steelworkers and then grew to include other organizations that joined the Blue Green Alliance. In 2008 then Senator Barack Obama embraced the green jobs frame by promising to create five million green jobs as part of his political platform for the presidency. This frame **substituted** the "threat to jobs" frame by promising to create millions of new jobs, a strategically important choice in light of the deep recession that the country faced. The "green jobs" frame helped to mobilize unions, environmentalists, and progressives to Obama's ultimately successful presidential campaign. Significantly, the "green jobs" frame also included plans for jobs specifically oriented toward LMI households through weatherization programs, and it thus linked to the frame of energy affordability for LMI households (Hess 2012). The frame of green jobs also helped to expand the electoral coalition to include both progressive environmentalists and voters from LMI households of all races and ethnicities who were attracted to the combined frames of green jobs, more affordable energy (through weatherization), and greenhouse-gas emissions reduction.

After the election, President Obama implemented policies consistent with the campaign promise in the first major legislation of his presidency: the American Recovery and Reinvestment Act of 2009. The act provided funding for green jobs training programs, LMI weatherization, and steel-based energy transition projects such as high-speed rail that the unions welcomed. The Democrat-controlled Congress introduced and in some cases passed a series of laws designed to support energy transition and job development. Among the new programs of the Obama administration was the Advanced Research Projects Agency—Energy (ARPA-E)

and various programs in the U.S. Department of Energy designed to support renewable energy and grid modernization.

The fossil-fuel sector and allies in the opposing Republican Party responded by **refusing** to engage the value of *environmental sustainability* associated with the frame of greenhouse-gas emissions and by **reasserting** the "job threat" frame. The incumbent coalition proposed that the new policies posed an existential risk to the millions of jobs in fossil-fuel extraction, refining, transportation, and retail. Passengers riding the Metro in Washington, D.C., saw advertisements about the millions of jobs as risk (and the threat that angry voters posed to elected officials). Conservatives also attacked the Obama administration's funding of solar companies and other programs associated with green industrial policy. Here they **introduced** the value of *good government* by framing the program as a waste of taxpayer funds and as an improper incursion of the government into the market. When one of the funded companies went bankrupt, Republicans in the U.S. House of Representatives passed the "No More Solyndras" bill in 2012 (HR 6213). They argued that the government had stepped into the field of picking winners and losers in the marketplace and that this was not an appropriate role for government. Thus, they elevated the Solyndra case into a lesson about why governments should not engage in industrial development policies, and they suggested that the policy was a threat to the value of a *sound economy* because the government was interfering in processes of marketplace competition. Accusing the Obama administration of misguided dirigisme and industrial policy, they combined frames that suggested that the policies violated the values of both *good government* and a *sound economy*.

By the 2012 re-election campaign season, President Obama had backed away from the green jobs frame, partly because the purging of Republican moderates in primary elections in 2010 was associated with the rise of climate denialism in Congress and in the public sphere. The change made any kind of "sustainable development" or "green jobs" frame toxic for a bid to gain support from independent and moderate voters. But the "green jobs" frame did not disappear in the more progressive states, such as California, Hawaii, Massachusetts, and New York, where state government leaders extended the frame from green jobs to local economic development. These frames **reasserted** the linked values of *environmental sustainability* and *sound economy*. For example, they highlighted the job creation benefits to the regional economy from having a vibrant cleantech sector and from engaging in the import substitution of locally produced renewable energy instead of out-of-state fossil fuels. This focus meant more local job creation and a healthier regional economy. Media coverage of green jobs at the local level—which tended to emphasize the positive news of local job creation and local business development—was indeed more positive than at the national level (Hess et al. 2018).

In this case, the primary value conflict involved framing and counterframing with respect to the broad value of defending a *sound economy*, with much of the focus on job creation and job loss. LMI families could potentially benefit from the creation of green jobs and the reduced energy costs associated with weatherization, but other LMI families could suffer from job loss associated with an energy transition away from the fossil-fuel sectors. The secondary value conflict involved *good government*

and the differing views of the proper role of government regulation and industrial policy in a market economy. Although *environmental sustainability* (greenhouse-gas emissions reductions) and *consumer protection* (energy affordability for LMI households) values appeared in the Obama administration's green jobs framing, the conservatives **refused** to engage these values.

2.5 Discussion

A primary implication of this analysis is to demonstrate the feasibility of a method for studying values in the context of processes of framing and counterframing among competing coalitions in energy politics. The study also has identified five processes in the relationship of framing and counterframing: introduction of new frames and values, reassertion of the same frames, refusal to engage the opponent's frames and values, substitution of a new frame with the same value shared by an opponent, and refraction of the same frame and value but with different meaning.

The comparative analysis of three cases of energy policy conflicts in the United States suggests that frames and values play an important role in energy conflicts because coalitions use them in the public sphere to legitimate their policy positions and to delegitimate the positions of their opponents. By selecting frames that are aligned with broad cultural values such as consumer protection, environmental sustainability, a sound economy, and good government, coalitions can attract supporters from across different institutional sectors. They can also portray their policy positions as consistent with widely held values and the public interest rather than with the sectional interests of specific interest groups. By referencing widely held values, actors transform their proposals for political and technological change or stasis from a self-interested perspective into one aligned with the general public interest. Doing so can enable their proposals to gain legitimacy in the public sphere and also to gain support in the political field. Thus, the referencing and articulation of general values is central to the symbolic power that coalitions of actors attempt to exercise in the public sphere because it aligns their position with general public benefit rather than sectional interest.

Some limitations should be recognized for this type of explanatory analysis. First, the causal explanatory power for policy outcomes is a separate problem. The selection of frames does not determine policy outcomes, but it is part of the process of building and maintaining coalitions that can acquire the public support and political weight that is needed to achieve a policy victory. A complete causal analysis of policy outcomes would include structural conditions and the full range of tactics that actors employ to gain support for their positions. Second, the portability of the method is unknown, but it is unlikely that the bundle of frames and the value groups can be applied to culturally distant cases of energy politics without some changes. Indeed, the comparison of the three cases suggests that the frames and values will vary from case to case even in a close group of cases in the same time period in the same country. In the net metering case, the primary value conflict involved con-

sumer protection, and the frames included affordability, reliability, and fairness in pricing. In the smart meter case, the primary conflict involved the values of consumer protection and environmental sustainability, with opposing sides having different interpretations of the same frames but also differences in the selection of frames. In the conflict over green jobs, the primary value conflict involved achieving a sound economy that can generate good jobs and economic development, but there were also differences regarding the proper role of government and the effects of government intervention in the economy.

With substantial variation even within a highly limited and small set of comparison cases, one should not expect to find that the set of values or frames identified here can be applied across a wide range of countries and policy conflicts. However, the method itself is portable even if the content of the frames and values may require some changes in other cultural contexts. This limitation is likely even if the analysis is restricted to contemporary energy policies in industrialized and industrializing countries with relatively democratic institutions. The portability of the categories of frames and values used in this analysis is an empirical question to be resolved through additional research, which eventually could build up a more complete set of frames and values that appear in a wider comparative context.

Comparative work that explores the portability of the method would need to include research on framing conflicts in culturally and economically different countries. To date the research on this topic for energy politics is limited, but there are some good studies in the anti-dam literature. For example, in a comparative study of two successful mobilizations against hydropower projects in Myanmar and Thailand, Kirchherr (2018) noted that in the case of the repressive government of Myanmar that had nominally shifted to civilian rule, the challenger coalition framed the region as part of the country's cultural heritage and used prayer ceremonies in support of saving the river because overt protest was considered too risky. Thus, an institutional logic associated more with *protecting cultural identity* was more prominent. In Thailand, as the movement grew and attempted to attract support from urban constituents, the framing shifted from the human rights of communities that would be displaced to the value of the river as an environmental resource worth preserving. Thus, frames associated with the value of *environmental sustainability* become more prominent.

In Brazil, some of the anti-dam movement research has also examined the question of framing and found a similar pattern of changes in frames that coincides with the development of coalitions. In the case of opposition to the Ribeira de Iguape River in Paraná, Thorkildsen (2018) noted that the original framing focused on human rights, which in this case were linked to the land and to the property rights of descendants of quilombos (communities formed by former African slaves). Thus, the value of *good government* and the frame of property rights were the starting reference points, but again an institutional logic that one might classify as based on a *protecting cultural identity* (quilombo descendants) was also salient. However, as the movement expanded to a national coalition that included urban partners, the framing shifted to "socio-environmentalism," which involved the frames of land preservation (*environmental sustainability*) and of the need to make government

licensing and decision-making processes more democratically accountable (a different emphasis on what constitutes *good government*). A similar trajectory occurred in the development of framing in the Uruguay River basin (Rothman and Oliver 1999). These frames based on the values of *environmental sustainability* and *good government* as democratic process frequently countered those of the pro-dam coalition, which focused on the *consumer protection* value of affordable and reliable electricity and the *sound economy* benefits of economic development for the country.

This brief discussion of the possibilities of a comparative project on the patterns of framing, counterframing, and values suggests how the conceptual framework would be modified with additional comparative work: values associated with other institutional logics (such as protecting cultural identity), different salience for institutional logics (the higher salience of political or good government logics), and different framings or articulations of the normative ideal for the same institutional sector (e.g., human rights rather local control or proper government spending). The general framework can be applied to track the play of frames, counterframes, and values, but the content will need to be adjusting to different cultural conditions.

2.6 Conclusion

One of the implications of this study in the context of interdisciplinary energy research is to suggest the need for clarity about whether their intellectual project is evaluative or explanatory, or at least where one approach begins and the other ends. If the intellectual project is explanatory, then the categorization of values can emerge from the mixture of empirical analysis of framing action and the general background comparative work on categories of values (such as the literature on institutional logics that was used here). However, if the goal of the researchers is evaluative, then they should be careful to explore and describe the limits of the first principles that they are articulating. For example, one might begin with a study of energy and ethics by developing a typology of principles associated with justice, and this approach can provide a useful yardstick for evaluating how well energy politics and programs throughout the world measure up against the principles. However, the explanatory approach of this study suggests that when one develops an approach to values based on the empirical analysis of frames and counterframes that are deployed in cases of energy conflicts, the concept of justice as the primary way of defining the normative dimensions of energy politics and policy may be limited. The same would apply to other broad normative categories of Western political thought, such as democracy.

In the empirical research presented here, concerns with two of the most prominent approaches to justice—procedural and distributive—appear only in some of the frames. For example, procedural justice appears in frames associated with democratic local control, and concerns with distributive justice appear especially in the frames associated with fairness in pricing and job creation (or job loss). It would be

difficult to subsume the wide range of frames described in this study (summarized in Table 2.1) and the associated values under a predetermined set of principles subsumed under a similar concept of justice. Even in this highly limited analysis, justice appears as a subset of the normative discourse, and using it to guide explanatory analysis of all normative discourse would likely lead to missing important dimensions of that discourse. This limitation would apply both to Western societies, such as the cases discussed here, and to more culturally distant societies or regions of the world, where other institutional logics (e.g., the protection of religious or cultural identity in the Myanmar and Brazilian cases) may be more salient in the framing and counterframing. Of course, one might proliferate definitions of justice (e.g., recognition) to cover more types of frames, but at some point the concept of justice then would become coterminous with the concept of values.

This study also develops a framework that can be adapted to comparative research in the study of values, ethics, and energy politics. It creates a flexible framework based on broad categories of values associated with different institutional sectors (the state, the household/family, the economy, political civil society, and in some cases religious and cultural institutions) and with the wide range of frames that appear in debates between opposing coalitions in the public sphere. The discussion indicates how the framework could be expanded for comparative work, where different institutional logics and frames may be more salient. But it is also possible to build up, through comparative research, a set of etic categories of values and frames that can be used as an analytic framework to help to explain how energy coalitions form and are maintained. In turn, this mode of analysis can feed into broader frameworks that utilize structural factors and other aspects of the political process to explain the outcomes of energy-related policy conflicts.

Moreover, the focus on framing and counterframing in this study suggests how the social scientific study of energy and values can go beyond the "langue" level (the symbolic system level) of the analysis of frames as merely rhetorical or persuasive devices to understand how they are embedded in strategic action that is oriented toward building and maintaining support for a political position. In this way, referencing of broadly shared values, either explicitly or implicitly, is not a trivial dimension of energy politics; rather, it is central to the quest for credibility and symbolic power in the public sphere and the formation of coalitions in the political field. Understanding how these processes work can be a powerful foundation for coalitions that seek to have more effective strategies of building more environmentally sustainable, politically accountable, economically viable, consumer-friendly, and culturally sensitive energy systems.

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Chapter 3
A Right Way, Wrong Way and Better Way for Energy Engineers to Work with Aboriginal Communities

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> *The land is the mother and we are of the land; we do not own the land rather the land owns us. The land is our food, our culture, our spirit and our identity.*
> *Dennis Foley, a Gai-mariagal and Wiradjuri man, and Fulbright scholar*

Abstract Aboriginal Australians have an intrinsic relationship to Country, kinship and community. The processes related to colonisation have decimated traditional lifestyles, ecology and even families. The challenge for energy engineers lies in the ability to reconcile the profession of engineering with the contemporary and traditional cultural and physical needs of Aboriginal people. A discussion around Aboriginal peoples' most deeply held values will be linked to both global and professional ethical canons. This discussion has implications for Aboriginal and Indigenous peoples globally. A fictitious case study—the 'Warrigal Downs Energy Hub'—provides us with a hypothetical project to which we can link both examples and frameworks. Our team of Aboriginal and non-Aboriginal educators and engineers provides us with a right, wrong and even better way to work sensitively, meaningfully and reciprocally with Aboriginal people in Australia and, indeed, globally.

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3.1   Introduction

Government and business interests have taken strong precedence over the needs of Traditional Owners through the brutal processes of colonisation which involve displacement of Indigenous peoples the world over. In energy engineering justice, morality and human rights largely remain outliers in decision-making—particularly in the case of First Nations people and communities (Sovacool and Dworkin 2015; Sovacool et al. 2017).

This chapter expands on some of the ethical concerns for engineers when working with Aboriginal Australians from an energy engineering perspective. We have chosen to focus on two important Aboriginal cultural or ethical tenets to frame our discussion. These are the deep spiritual and cultural relationship Aboriginal people have with Country.[1] The second of these is the need for recognition and respect for community and inclusive decision-making. We examine, briefly, a collection of ethical codes developed to address these tenets—some of which have been specifically written for engineers. To further apply principles of good ethical practice, we present a hypothetical case study—*The Warrigal Downs Energy Hub*—where we examine commonly encountered ethical situations and provide possible solutions for consideration.

The authors of this chapter are a team of Aboriginal and non-Aboriginal colleagues—engineering educators; facilitators of an 'Aboriginal Content in STEM' programme and industry professionals. We draw on our lived and professional experiences to propose some practical ways forward for those energy engineers working with Aboriginal communities. Many of these insights will be relevant to Indigenous communities in other countries who have experienced similar decimation of land, culture and identity.

For the purposes of this paper, the authors recognise the following expressions: 'First Nations' relates to Traditional and Sovereign Owners of Country prior to colonisation. 'Indigenous' is also used in this context, and can be seen used widely in global documentation (for example, *UN Rights of Indigenous Peoples*). However, in South Australia, the nomenclature preferred by Traditional Owners is 'Aboriginal people'. (In fact, the land on which this paper was written is the home of the Adelaide Plains Aboriginal people, The Kaurna people.)

Martin (2005: 28) cautions against the extensive use of principles of universality, stating that the 'one-size-fits-all' model can be viewed as disrespectful. There were more than 250 diverse Aboriginal language groups in Australia at the time of colonisation (in 1788) and traditional ways vary from coast to mountains to desert. That said, colonisation and connection to land or Country are often seen not just as common experience across Australian Aboriginal communities, but are *in common* with Indigenous communities globally.

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[1] Country (capitalised) refers to the cultural and ancestral homelands of Aboriginal people. Traditional Owners (capitalised) refers to the Aboriginal and/or Torres Strait Islander peoples who inhabited the land prior to and after colonisation in 1788.

Nurysheva, Amrebayeva and Amrebayev in Chap. 4 touch on themes which are resonant of Australian Aboriginal ethos: a holistic worldview where community well-being is strongly linked to nature and an individual's relationship to their community. In referring to First Nations people in America, Sovacool et al. (2017: 680) point to the efforts of Indigenous peoples to prevent fossil fuel development. Manno and Martin (in Sovacool et al. 2017) cite responsibility and concern for land (Country), along with concern for each other (community), as the overriding reasons for such struggles.

For this reason, an exploration of the experiences of Indigenous peoples and energy ethics, globally, might provide us with some useful and transferrable comparisons.

3.1.1   Relationship to Country

The deep **relationship between Aboriginal Australians and Country** is the first defining feature of the culture and spirituality of those who have lived on mainland Australia and in the Torres Strait Islands for more than 60,000[2] years (Pascoe 2012: 4). As such, Aboriginal Australians have managed their lives in ways which are harmonious with the seasons, the climate and the land (Gammage 2011; Jordan 2012; Pascoe 2018).

Aboriginal ways of life are deeply imbued with a knowledge of the land which has evolved over tens of thousands of years. This knowledge encompasses sophisticated farming methods; use of fire to manage the land and engineering solutions to harvest food (Gammage 2011; Jordan 2012; Pascoe 2018). Ganesharajah (2009) emphasises that Aboriginal peoples' relationship with their land is regarded as intrinsic to their health and well-being both spiritually and physically.

Massacres, relocation from traditional communities to Christian and government missions and the forced removal of children from parents have seen a wholesale displacement of Aboriginal Australians from Country in ways which can only be described as devastating and traumatic. At the time of European colonisation, Aboriginal people numbered up to 1,000,000 (Williams 2013) across 250 identified Countries[3] within Australia. The Australian Government Institute of Health and Welfare (2017) now estimates that there are 761,300 Aboriginal people living across urban, regional and remote areas representing 3% of the overall Australian population (Australian Bureau of Statistics 2018).

In the twentieth century, displacement has been coupled with direct damage to Country through, for example, the British testing of nuclear weapons and the min-

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[2] There is now some evidence that Aboriginal people may have lived in Australia for 120,000 years (Bowler et al. 2018).

[3] There were more than 250 Aboriginal language groups in Australia at the time of colonisation. Less than half of these languages are spoken today and many of these are endangered. The term 'Country' refers to a clearly defined area, territory or community.

ing industry. There is further impending damage predicted as a result of climate change which will impact, particularly, on those living in remote areas (Green 2006; Zander et al. 2013).

Arguably, the most notorious example of damage to Country and displacement of Aboriginal people from communities took place during the 1950s and 1960s when the British conducted a series of nuclear tests in South Australia at Maralinga—the traditional homelands of the Anangu Pitjantjatjara peoples (Tynan 2016). The tests caused significant levels of radioactive contamination. The land, to this day, is barely habitable and there remains a legacy of health and spiritual distress. Effects on the health of local Aboriginal people in the vicinity of the tests, include blindness, poisoning and sickness (Mittman 2017). There was also wholesale displacement of the local communities who were 'relocated' to the Yalata community which was in some cases hundreds of kilometres away from their traditional lands. There was a stripping away of traditional ways of life, with little regard for the cultural needs and differences of those placed together.

> *Needless to say […] Anangu Pitjantjatjara people regard the site with fear and suspicion. It is 'poison country', which has caused a range of previously unknown health problems […] and will haunt the community for many generations to come.* (Mittman 2017: 31).

Since Maralinga, several uranium mining proposals have been instigated in Australia's Northern Territory, including mining developments within the geographical area of the World Heritage listed Kakadu National Park. The Ranger Uranium mine is situated on the lands of the Mirarr Aboriginal people. The mine has been operating for more than 30 years and it has been fraught with problems including hundreds of leaks of contaminated water, spills and serious breaches of environmental licence conditions (ABC News 2013). Over the years, the Ranger Uranium Mine has generated more than 30 million tonnes of liquid tailings waste (Australian Nuclear and Uranium Sites 2019; Gundjeimhi Aboriginal Corporation 2019).

That Kazakhstan has experienced a similarly dubious association with the nuclear industry is echoed earlier by Nurysheva, et al. The country, like Australia, has seen nuclear testing alongside uranium mining and storage of nuclear industry by-products. Like the Aboriginal communities impacted by Maralinga in the 1960s, testing at the Semipalatinsk in Northern Kazakhstan has left an intergenerational legacy as a result of radioactive contamination. The tests have rendered irrevocable damage to the environment, to the people and to subsequent generations. The land has only recently (in 2016) been deemed safe for human habitation. The Kazak people remain staunch advocates for nuclear non-proliferation on the world stage. Nurysheva et al. describe the peace-loving nature of the Kazak people as antethematic to war and weapons of war.

The processes of colonisation have marginalised and ignored the voices of Aboriginal peoples, globally, on matters related to Country. For example, Hurlbert and Rayner (2018) present the case of a proposed gas pipeline in Canada. Here, the Chippewas First Nations were unsuccessful in their appeal against the development when they expressed their concern over the failure to 'consider environmental

harms, the impact of leaks on land, resources, Aboriginal hunting and trapping, fishing rights or health'.

In looking to the future, Green (2006: 1) cautions how extreme weather conditions caused by fossil fuel emissions and ensuing climate change are predicted to impact significantly on the mental and physical well-being of Aboriginal peoples living in remote areas. This is because of a 'heightened sensitivity to ecosystem change' which is likely to see an increase in bushfires, dust storms, saltwater inundation and droughts. Zander et al. (2013) explore how Aboriginal people may need to adapt to the impact of rising sea levels due to climate change either by moving off Country, or staying on Country with Government help. Changes such as loss of land, floods and extreme weather events are now regarded as undeniable and predictable.

3.1.2   Community Connection/Consultation

Connection to community and inclusive decision-making is a defining feature of Aboriginal communities. Traditionally, Aboriginal peoples share resources and have a strong sense of collective ownership. Martin (2008: 29) explains how there is a clear understanding of 'reciprocity' and 'responsibility' in day-to-day decisions. This includes any developments impacting on communities. Aboriginal people, whether living in urban, regional or remote areas, value decision-making protocols which are respectful of Elders, kinship structures and the communities as a collective.

However, since colonisation, 'White Australia' policies have silenced Aboriginal voices in decision-making, the process of silencing has been enacted through displacement from land, denial of citizenship and the forced removal of children from families (the 'Stolen Generations'). Stanner (1969) famously describes the 'cult of forgetfulness practised on a national scale' which has denied past wrongs and ignores Aboriginal rights to sovereignty and self-determination.

Lack of due regard for the sanctity of Country, along with lack of meaningful consultation by non-Aboriginal interests, has effectively demeaned the trust between Aboriginal and non-Aboriginal Australians. Since colonisation, Aboriginal Australians have largely been excluded from decisions in a variety of systemic ways. Firstly, these have included the invasion of their lands by early agriculturalists. Secondly, Aboriginal people were forced to live under a paternalistic 'protectorate' system, which (until 1968) saw all Aboriginal people denied voting rights, citizenship and the right to make their own decisions.

There has been an imposition of Eurocentric development which has seen inappropriate housing and other settlement solutions, along with the taking of natural resources without consent. This invariably starts from a position of profit making—rather than wealth sharing—and is at odds with the traditional Aboriginal community cultural norms. Calma (2007), in addressing the Tangentyere Council on the

matter of housing leases for Aboriginal people in the Northern Territory, sum-marised the right to consent and self-governance:

- *Our consent should be sought and freely given prior to the authorisation…of any development activities*
- *We should have full information about the scope and impacts of the proposed development activities on our lands…*
- *We should have the choice to give or withhold consent over developments.*

Nearly one-third of all global uranium reserves are found in Australia. Commercial uranium mining since 1910 has seen a combination of both a flagrant disregard for the health of Country as well as self-determination and decision-making—with little or no regard for the concerns of Traditional Owners (Iserles and Brown 1999; Phillips 2015). Graetz (2015) describes the negative impact energy production in uranium mining has had on Australian Aboriginal people, emphasis-ing the importance of developing mutually beneficial outcomes and positive grass-roots relationships with Traditional Owners.

However, consultation does not always result in desirable outcomes for Aboriginal people.

The uranium deposit on Mirarr land took years of negotiations between govern-ment and mining proponents, to the point where the Mirarr people became exhausted from years of endless meetings, negotiations and 'consultation'. In 1996, the project went ahead, despite the continued open opposition of the Mirarr people and the fact that the mine was located in a UNESCO World Heritage area. They remain staunchly opposed to mining on Country and have become one of the largest national and international campaigners against uranium mining in the world (Gundjeimhi Aboriginal Corporation 2019). Their efforts finally culminated in the mining com-pany signing an agreement preventing the development of the mine from ever occurring without the explicit consent of the Mirarr Traditional Owners. This led to 15 of the world's biggest mining companies committing *never* to mine in World Heritage Areas (Australian Nuclear and Uranium Sites 2019). Unfortunately, though, the landscape is forever altered, and the $67 million allocated to rehabilitate the land will never cover the costs which are estimated to be closer to $500 million (Phillips 2015). In a similar vein to the Kazak people (referred to in Chap. 4 by Nurysheva et al.), the Mirarr people have found it deeply distressing that uranium from their lands (which should have remained underground) could potentially be used for nuclear weapons or may have been exported to nuclear power plants in other countries where there have been major environmental incidents and disas-ters (Gundjeimhi Aboriginal Corporation 2019).

Aboriginal people's relationship to Country, inclusive decision-making and the ethical right to self-determination have complex implications for engineers across all sub-disciplines—including energy engineering. These values are deeply imbued with traditional connotations which are cultural (lore) and canonical (law). These do not provide 'ethical' frameworks in a true Western paradigm. However, where ethics is understood to be a process which evaluates 'human happiness, human good or human wellbeing' (White 1988: 22), the denial of these rights by others poses a strong ethical issues. Many of these issues are now embodied in ethical frameworks.

3.2   Towards an Ethical Framework

The measurement of human good, well-being and happiness benchmark the degree of ethical integrity in any decision made—including those of energy engineering planners and analysts (White 1988; Sovacool and Dworkin 2015). Energy Justice is a subset of ethics, and can be viewed as a 'global…system which fairly distributes the benefits and costs of energy services' (Sovacool and Dworkin 2015: 436). Where Western legislation allows for engineering development, there has been risk of displacement of people; the taking of resources; desecration of land and the diminishing of culture. Acknowledgement of the central importance of an Aboriginal community or person's connection to Country to their well-being, along with strong community-based consultation, begins to provide a framework for ethical decision-making in energy engineering.

Historically speaking, engineering, ethics, justice and Indigenous peoples are a relatively contemporary marriage. Principles of 'redress'; 'free and informed consent' and 'sustainability' as outlined in the *United Nations Declaration on the Rights of Indigenous Peoples* were formally enacted as recently as 2007 and only officially endorsed in Australia in 2009 (United Nations 2008; Reconciliation Australia 2017).

In order to address the ethical impasse between Western development and traditional communities, there are some significant agreements or guiding principles which outline the ethical obligations of engineers to Indigenous and/or Aboriginal communities (see Fig. 3.1). Woven throughout, we can see a strong emphasis on Country, consultation and the right to self-determination. These agreements coalesce across global, national and professionally developed codes of ethics or professional conduct. The codes/agreements listed in figure 3 address, specifically, culture, regard for country and consultation.

3.2.1   Universal Declaration of Human Rights (1948)

The Universal Declaration of Human Rights is an overarching canon of ethical responsibility which recognises (in Article 1) the inalienable rights to freedom and equality and our responsibility towards each other in the enactment of these rights (United Nations 2015 p. 4) and in Article 22 the 'economic, social and cultural rights indispensable for dignity' (United Nations 2015 p. 46).

3.2.2   UN Declaration on the Rights of Indigenous Peoples (2007)

The UN Declaration (United Nations 2008) further develops notions of social responsibility, cultural and ethical rights specifically to Aboriginal peoples' relationship to Country.
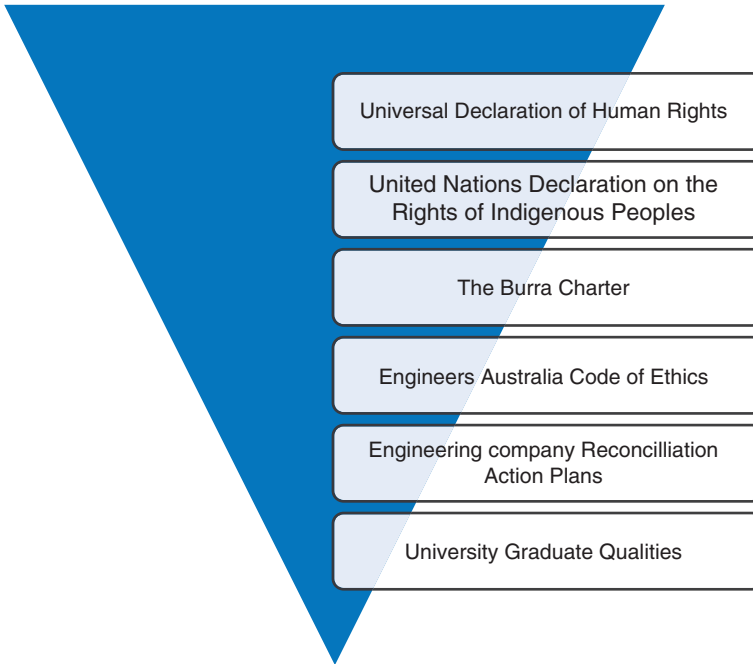
Fig. 3.1 International, national, professional, educational and industry standards for engineers

For example, from a global perspective, the United Nations *Declaration on the rights of Indigenous Peoples* (2007) recognises that Indigenous peoples have:

> *The right to maintain and strengthen their distinctive spiritual relationship with their traditionally owned or otherwise occupied...lands, territories, waters and costal seas and other resources and to uphold their responsibilities to future generations in this regard.* (Article 25, p. 10).

It also recognises the right to self-determination and governance in terms of economic, social and cultural development (Article 3, p. 4) and 'redress' and 'restitution' where consent has not been sought (Article 11, p. 6).

3.2.3   *The Burra Charter (1978)*

The Burra Charter also segues from the United Nations, via the UNESCO World Heritage Committee. It was developed by the Australian chapter of the International Council on Monuments and Sites (ICOMOS 2013) and recognises '...management of a place should provide for the participation for whom the place has significant *associations* and *meanings,* or who have social, spiritual or other cultural responsibilities for the place' (Article 12: Participation). Also, 'Co-existence of cultural values should always be recognised, respected and encouraged. This is especially

important in cases where they conflict' (Article 13: Co-existence of cultural values). First adopted in 1979, this is a widely consulted document for principles for building and development work on traditional lands.

3.2.4 *Engineers Australia Code of Ethics*

In terms of the professional ethical obligations of Engineers, the *Engineers Australia Code of Ethics* also draws our attention to promoting 'the involvement of all stakeholders and the community in decisions and processes that may impact upon them and the environment' (Article 4.1, p. 3) along with the incorporation of 'social, cultural, health, safety, environmental and economic considerations' into any given engineering task (Article 4.2, p. 3).

3.2.5 *University Graduate Qualities*

Universities require all students to understand the value of ethical behaviours and to be comfortable with different social contexts. Increasing numbers of Australian universities are committing to Indigenous Graduate Attributes, with the aim of increasing 'awareness', 'knowledges' and 'abilities' to work with Aboriginal and Torres Strait Islander peoples and communities (Bodkin-Andrews et al. 2018). Universities Australia (2011) provides a best practice framework for Indigenous Cultural Competency in Australian Universities.

3.2.6 *Reconciliation Action Plans*

Where the *Engineers Australia Code of Ethics* refers to culture in its broadest sense, many Australian organisations (including civil, mechanical and electrical engineering companies) have a 'Reconciliation Action Plan' (RAP). RAPs aim to develop knowledge about Aboriginal history, culture and the importance of working together. They are developed by companies and organisations in collaboration with Aboriginal community members providing guidelines around consultation and collaboration (WSP 2016).

In summary, the examples provided here acknowledge cultural and spiritual connection to land and inclusive decision-making. Sovacool and Dworkin (2015) express concern about the lack of regard for ethics and morality during the planning and analysis processes in the Energy industries. Despite this, the guiding documentation and best practice examples for working with Aboriginal communities are available and, indeed adopted, by professional engineers. In a world where the voices of First Nations peoples have been actively and systemically silenced, the

process of developing the culturally sensitive engineering professional must start with undergraduate education (Duff et al. 2018) which, in turn, aligns strongly to the ethical cannons of the profession.

The following case study the—*Warrigal Downs Energy Hub*—highlights how these ethical principles may apply providing some steps towards developing reciprocity for engineer and community alike, while preserving the integrity and care of Country and consultation.

3.3   The Warrigal Downs Energy Hub

The Warrigal[4] Downs case study highlights some of the many complexities and conundrums which beset community and engineer, alike. These issues have arisen because of complex social, political, historical and cultural factors. In Australia, they are complicated by the systems of governance which recognise local, state and federal legislation, meaning what is required in one jurisdiction may be quite different in another.

Our purpose in creating a hypothetical case study is to suggest a broad range of 'typical issues' besetting large engineering projects which take place on the lands of Aboriginal people. In examining some of the all-too-common 'worst practice' examples, we turn to a more optimistic scenario, supported by engineering studies and best-practice examples.

In our case study, ABC Energy Corporation has prepared a business model for a new solar, wind and hydro-electric Energy Hub, to be known as the 'Warrigal Downs Hub'. The privately funded hub anticipates payback within 15 years. It is designed for a 25-year operation (noting such Hubs will be maintained with a view to lengthen this significantly, pending technological developments versus the rise of maintenance costs as the plant ages).

The proposed Hub sits within a remote Southern coastal zone of South Australia and features a number of watercourses including a small river. All watercourses flow into the ocean. There are hilly regions with caves along much of the coast. This land is used by the current landowner for the grazing of livestock and growing cereal crops across the plains. It has been designated for this use since 1844.

Prior to colonisation, the area was a trade route for Aboriginal communities between the hills and the sea. It is known for its significant Aboriginal cultural artefacts and sacred sites. There is a high-voltage transmission line to the North East of the site. Linking of the Hub to this line will allow the feeding of energy back into the grid.

The following **Hub** components link to both energy engineering and civil engineering works.

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[4] 'Warrigal' is the derivative of a Koori Aboriginal name which means 'Dingo' (ABC 2012). The Dingo is a ubiquitous indigenous animal (similar to a dog) living in and with strong mythological links to the Australian outback.

3.3.1   Operations and Maintenance Facility (OMF)

1. Operations including site offices; car parking; storage of smaller parts; workshops.
2. Battery storage (batteries; smaller transformers).
3. Major Transformer and links to the high-voltage transmission line.
4. Other services (water, telecommunications, low voltage power) to be connected from existing services. Sewerage for the OMF is captured onsite and pumped out of large holding tanks for treatment offsite.

This facility adopts a large hardstand zone, site clearance significance to accommodate the infrastructure for this component.

3.3.2   Solar Panels

These will ideally be located on near-level plains. New access roads will be constructed, and services will be trenched, linking panels back to the transformer site.

3.3.3   Wind Turbines

These will be typically located through hilly zones to maximise use of windy zones along the coast. New access roads with wide sweeping bends are required to allow transportation of long turbine blades and other components on low loader trucks. Services will be trenched to link turbines back to the transformer site.

3.3.4   Hydro Energy

This is proposed to store energy, with the construction of dams at high and low levels the intent. Water can be pumped from low to high, then released downstream through a power-generating turbine. Concrete spillways direct flow to a low-level dam. Water is topped up from nearby creeks or the ocean.

3.3.5   Access Roads

These are typically unsealed and used for maintenance access once construction is complete.

3.3.6 Fencing and Gates

These restrict public access to the site, in particular, the transformer and battery storage site.

3.4 Principles for Engineers to Work with Aboriginal Communities

3.4.1 Connection to country: Two-Way Learning

The Wrong Way
Standard procedural documentation may call for university educated experts with a degree. This eliminates the opportunity to call upon local Aboriginal knowledge.

Aboriginal knowledge of the land, the complexity of ecosystems and interconnection of natural systems offer sustainable solutions that are ignored. Solutions designed without regard of Aboriginal knowledge may result in inappropriate, unsustainable, costly and complex solutions that do not meet the needs of Aboriginal people and, if socially or environmentally unsustainable, the needs of the mainstream community.

Far from being 'invisible', 'tribal' and 'ignorant', there existed sophisticated knowledge systems which had for centuries seen land managed (Gammage 2011; Pascoe 2018) and fit-for-purpose engineering systems implemented.

For example, Jordan (2012) rejects the notion that engineering came to Australia with the arrival of non-Aboriginal colonists. The author describes a complex engineering project for the purposes of fish trapping within the Budj Bim lava flow landscape in South Western Victoria. Here, Aboriginal people used a complex system of hydraulic works, stone races, canals, channels, trapping points and a sink hole.

Aboriginal people have for tens of thousands of years lived in harmony with the land, tended the land, cultivated crops and managed ecosystems through fire management. Knowledge that is ancient, tested and has sustained the oldest living civilisation has been disregarded and historically denied (Pascoe 2018; Watson 2015).

Stewart et al. (2019) list several examples of successful Aboriginal enterprises worthy of two-way learning. These include conservation of biodiversity through using traditional knowledges of ecology. They also include managing carbon emissions through traditional fire management methods. These have been used for broad land management, but potential has also been identified for energy efficiency and renewable energy projects (Stewart et al. 2016).

Two-way learning recognises the sophistication of knowledge occurring in harmony with the natural environment. It is to these knowledges we are just now starting to turn as the natural environment undergoes the onslaught of climate change. For two-way learning to be successful, there needs to be the recognition that there are different knowledge systems and that each knowledge system is as valid as the other. To exchange knowledge freely, there has to be a level field of power as well as mutual trust.

The Right/Better Way
Call upon local Aboriginal knowledge of the flora, fauna and cultural heritage of the project area. Work with Aboriginal people to make traditional knowledge systems and cultural practices an integral part of the design and proposal of works. Take the time to get to know and build trust with Aboriginal people. Give Aboriginal people the voice to share their knowledge of the land. This could, for example, mean that an engineer, a planner and a botanist are working alongside a group of Aboriginal rangers that the local Aboriginal community selected for their knowledge about how to best to protect the land and cultural sites at the site of the proposed development.

3.4.2   Connection to Country: Caring for Country

The Wrong Way
Development plans allowed for limited input from the Aboriginal community, and approval for construction has been achieved. Civil engineering works have commenced onsite. Road corridors have been cleared, existing natural vegetation stripped, trees felled and removed, and the excavation of hillsides and levelling of hilltops have occurred to accommodate the large cranes required to lift the wind turbine components into place.

 The construction of large dams now inundates previously inaccessible lands, and vegetation up to the high-water level will struggle and likely die from inundation over time.

Pollution, desecration and destruction of animal habitat destroys the very spirit of the Traditional Owners. Watson (2015) describes the impact colonisation has had on Aboriginal people as 'muldarbi', the 'demon spirit'. This Aboriginal ancestor spirit did not act in ways that let the natural world benefit to the collective. Colonisation demanded the all of the natural world for the colonisers. The 'uncivilised' were to be absorbed and, their worldviews and knowledges to be annihilated.

 This approach fails to take into consideration the close cultural connection of Aboriginal people to their land, which is viewed as mother. As such, Aboriginal

people see the nurturing and custodianship of land as central to physical and psychological well-being. The solutions presented here are likely to negatively impact on an entire, interrelated geographical and ecological system. However, there *are* laws (in addition to the ethical imperatives) to safeguard both the ecology and the 'traditional knowledges'. Robinson and Raven (2017) point to the *Convention on Biological Diversity* and the *Nagoya Protocol* along with state and federal laws, Indigenous lore and the codes of ethics such as those listed above. Native Title law also gives Aboriginal Australians a voice in the way land is used and the ability to make decisions around heritage in impact assessment and mitigation.

> **The Right Way/Better Way**
> *Alternative solutions to affecting the land need to be reviewed. Is the inclusion of hydro necessary? This has a lasting effect on a previously free draining river valley. Is it necessary to clear such a large area of vegetation? Can this be done in a way that has minimal disruption to the local fauna and in a way that ensures that the area can be revegetated in a timely manner?*

3.4.3   Consultation: The Project Approval Process

> **The Wrong Way**
> *In reference to the location of the Warrigal Downs Energy Hub, a parcel of land was identified based on geographical features; close proximity to an existing high voltage power line corridor and high coastal winds. No early stakeholder engagement has been undertaken with Traditional Owners of the land. This links to the mind-set of Terra Nullius and a complete ignorance of local connections to Country.*

Stakeholder engagement cannot be used once off and forgotten; this is a continual process. It requires integrity, openness and genuine effort. It is not a process to be simply checked off a list, but an integral part of the potential future success of a project.

In engineering, Aboriginal groups are often 'consulted' about infrastructure projects at the tail-end of project planning, with participation often being limited to involvement in cultural heritage surveys. In other words, the majority of decisions about the project have already been made before Aboriginal groups become involved. A best-practice approach to engagement with Aboriginal communities would see Aboriginal people involved in all stages of project planning, not just in the final stages. In this way, the community should help identify land that may or may not be appropriate for development, outline any areas of cultural sensitivity and even gain an early understanding into economic development opportunities.

To be able to support this type of approach, a whole shift in the way Aboriginal involvement is viewed must be implemented and, to do this, those responsible for project delivery need to be educated and exposed to the importance of Aboriginal culture.

This, of course, would need to start at university. Australia's engineering students, who will one day be responsible for the delivery of infrastructure projects across the country, learn about more than just engineering as part of their degrees. They also learn about finance, planning, ethics and management. There has been a paucity of learning about Aboriginal heritage and culture and the importance of engaging with Aboriginal communities on infrastructure projects (Duff et al. 2018). Instilling an early respect for Aboriginal tradition and intrinsic knowledge would surely benefit infrastructure project delivery and ensure that social and cultural outcomes are optimised. This benefit would be further emphasised by expanding the definition of sustainable development to include the considerations and values of the Traditional custodians of the land.

Karanasios and Parker (2018) provide an analysis of 71 renewable electricity technologies projects developed in remote communities of Canada. The authors conclude that solutions should not be imposed on the communities. Instead, positive interactions with the communities should be initiated at early stage while having supportive policies in place. This would allow individual communities to determine and achieve electricity generation goals based on their own visions and capacities, not restricted to the deadlines of others. The same study provides a list of Indigenous community-driven projects which were successful because of court decisions favouring community participation in projects.

The Right Way/Better Way
Engaging at the outset of the project with the Traditional Owners/custodians of the lands to extensively review potential locations for the engineering works planned needs to occur. Aboriginal people must both agree to the location of the proposed site and the purpose of the proposed site. Where this may include, for example the construction of an access road, it must be ensured that the Aboriginal community is actively participating in the decision-making process regarding the location of road alignments, turbine pads, and creek and river crossings. Effects on road alignments through the environment must be considered and addressed. Clearing of vegetation needs to be highlighted, noting not just significant trees but also any areas and other vegetation that are of significance to the Aboriginal people. It is vital that the Traditional Owners understand the purpose, benefits and detriments of the proposed project and are not only consulted but given voice and veto in the decision-making process.

3.4.4   Consultation: Respect and Inclusion

The Wrong Way
Many engagement programmes use typical consultation materials and standard project descriptions. These are then used uniformly across a number of stakeholder groups who may have an interest in an infrastructure project. Opportunities for providing feedback are generally limited to feedback on dedicated free call phone lines or open workshop situations. Community engagement meetings are limited to a window of time that suits the organisers—following standard procedures that are suited to the organiser's needs, not the unique culture of the Aboriginal community.

When planning to undertake engagement with Aboriginal communities in relation to infrastructure projects, careful consideration should be given to when, how and why to engage. Aboriginal communities differ across Australia—no two are the same, and what may have worked well at one community may not be appropriate or suitable for another.

Community engagement is not a 'one-size-fits-all' solution to project feedback. As with any Australian community, engagement with Aboriginal communities must be undertaken with respect in the first instance, followed by a willingness to really listen to what is being said and to act accordingly. Appropriate language must be used both in presentations and in community engagement material, the timing of engagement must be considered; are there any community events occurring that may limit people's willingness to be involved in the project? Are there any cultural sensitivities that need to be observed and does the community really understand the implications of the project and what is expected of them?

In Australia, Aboriginal people have sometimes been forced to modify traditional ways, making changes to living environments without sufficient resources. O'Rourke and Nash (2019) explain how these modifications have been necessary for basic energy efficiency and warmth, as well as for the maintenance of cultural continuity. Unfortunately, policy-makers have undervalued the significance of aspects such as the grounds of the property for improved and sustainable living (O'Rourke and Nash 2019). Jenkins et al. (2018) argue that the energy justice and transitions frameworks can be combined—mitigating environmental impacts of energy production through 'sociotechnical change' in ways which are more socially and ethically sound.

Bullock et al. (2018) point to successful and collaborative forestry, energy and mining projects where Indigenous peoples' participation has been encouraged—engaging and giving voice to Aboriginal values.

A case in point from Australia is the Ara Irititja Project (Hughes and Dallwitz 2007) where a cultural repository of previously removed artefacts and cultural items such as photographs and recordings was developed on the Anangu Ngaanyatjarra, Pitjantjatjarra and Yankuntjatjarra lands. In-depth consultation over several years resulted in the establishment of a complex, layered resource where men and women's sacred stories are kept on separate servers. Access to cultural information is limited according to

status and kinship rules within those Aboriginal communities. This has ensured that the Ara Irititja resource is culturally sustainable. According to Hughes and Dallwitz (2007), this project was successful as technical 'experts' maintained humility about their technical expertise. Their success involved creativity and patience as well as a willingness to wait. Hughes and Dallwitz (2007) further describes an openness to the idea that there is *no* standard response—only community and individual requirements.

The Right Way/Better Way

Engagement with Aboriginal communities needs to be targeted to needs of the community in question. Are PowerPoint or whiteboard presentations really the most appropriate forum for all communities? Does everyone want to receive brochures, hand-outs and feedback forms? Some communities might prefer to just sit with a few members of the project team and talk through their concerns or understanding in person. Is it appropriate to have meetings with only women/only men as there could be areas within the project scope which have traditional meaning for different genders? Ensure that all ages within the community are involved. Some members of the community may not understand highly technical language. Engagement materials should be reviewed for appropriateness and the project team ideally should have received training in cultural awareness and active listening. Ensure that there is more than one meeting and that people have the opportunity to ask questions. Aboriginal people know a great deal about the land and much of this information is invaluable to infrastructure projects. When engagement is undertaken early in project planning and when respect for people and Country is shown. Aboriginal people are often more than happy to share some of their knowledge with engineers and project proponents.

3.4.5 Consultation: Redistribution of Wealth and Reciprocity

The Wrong Way

ABC receives all wealth created from the Warrigal Downs Energy Hub. The current farming landowner receives an annual payment for use of the land. Access is provided for operation and maintenance around the farming activities currently undertaken across the remainder of the project site. Specialist technicians are employed operate and maintain the Warrigal Downs Energy Hub. No wealth is provided to the local or Aboriginal community. Construction companies utilise their own labour force mobilised from interstate.

ABC commit to upgrading of nearby council roads after construction of the Warrigal Downs Energy Hub is completed. This is seen to benefit the local farming community. Limited engagement with the local Aboriginal community has resulted in a shoehorn 'one size fits all' approach, without due care given to specific local factors for this project and the local community.

Reciprocity and responsibility are important elements of Aboriginal culture. Land ownership is bound in moral, ethical and legislative constraints with Traditional Owners on one hand (moral) and the current (post-colonial) land owners on the other. Reconciling the two is very difficult (Bourke et al. 1998).

When considering infrastructure projects, it is crucial that we explore opportunities other than profit through land that can benefit local Aboriginal communities. One of the most important aspects of including Aboriginal people is through employment in all phases of development, construction and operation. Where Aboriginal people have ownership, at the very least in regards to participation, projects are not only more likely to succeed on a long-term economic basis, but also likely to contribute positively to the social and economic fabric of the Aboriginal community in question.

The creation of wealth requires significant investment in infrastructure to construct the Warrigal Downs Energy Hub prior to power being generated. Corporations/governments funding such infrastructure will only approve such a development with a business case and supporting engineering investigations (monitoring of wind speeds, solar hours, etc.) to prove such an investment is worthy.

It is important that we do not only consider the worthiness of such an investment through the lens of corporations and governments, but provide for reciprocity and give due respect to possibilities of creating positive impact in Aboriginal communities.

The Right Way/Better Way

A successful model is holistic, considers the outcomes beyond an economic profit for corporations and governments and includes positive environmental, social and cultural benefits.

For governments/corporations, a profitable Warrigal Downs Energy Hub will produce more power with a pay back to the grid than the investment costs upfront, noting a payback period of nominally 25 years.

For instance:

- Can this payback period be extended, with an additional allocation of profits being fed back into the local Aboriginal community?
- The business model includes a yearly payment to the landholder where the solar panels and wind turbines are located. Should local Aboriginal communities receive a portion of this payment as Traditional Owners of the land?
- Scholarships at university could be offered to Aboriginal people from the area.
- Nearby Aboriginal communities could be supplied with free/discounted electricity.

Include Aboriginal employees within the Warrigal Downs Energy Hub's maintenance crews, who are required to operate such a plant. This boosts

local and Aboriginal employment opportunities. Ensure that there are training opportunities.

ABC engages with the local Aboriginal community and, together with the Aboriginal people, identifies local Aboriginal projects and employment opportunities that will benefit the community.

ABC directs a percentage of wealth created to these community projects including the upgrading of existing sporting facilities, along with community housing and revegetation of nearby abandoned lands (which were contaminated from defence base operations). These works are scheduled over the next 10 years with funding allocated from a percentage of profits. Local Aboriginal people are assigned job-specific training to allow them to join the maintenance crews for the operation of the Warrigal Downs Energy Hub. A scholarship is set up to encourage local Aboriginal people to go on to further study perhaps in the areas of engineering or construction.

The local community would prefer to see commitments made to local employment for Aboriginal and non-Aboriginal people, and community projects such as land remediation, community housing, public artwork opportunities and the like. Working collaboratively together with the Aboriginal community to form a plan for improving the community as a whole, identifying areas of shortfall that most benefit, bringing long-term solutions rather than quick fix solutions. Incorporating the Warrigal Downs Energy Hub into the community by bringing employment, and other opportunities (such as permanent Aboriginal artwork on the turbine masts) have been identified.

3.5 A Model for Working Together

The *Warrigal Downs Energy Hub* traverses two key tenets which are intrinsically linked to health, well-being and self-efficacy of Aboriginal Australians—a strong connection to Country and the importance of community and inclusive decision-making.

Aboriginal people should be consulted about a renewable energy project in a timely fashion just prior to and not after, a planning approval has been granted (Calma 2007). In current engineering practice, their opportunity for involvement with a project is brief and tightly restricted to a process that more or less mirrors that of a 'site-clearance'. In other words—ensuring that there are little or no archaeological or anthropological issues at a chosen site.

In many instances, if a project is planned on 'freehold' land, Aboriginal people may not even get the opportunity to have a say at all. This process is isolating. It restricts Aboriginal involvement and is the antithesis of the recognition of Aboriginal people as Traditional Owners who retain a close ancestral, cultural and spiritual connection to the land. Regardless of land tenure and ownership, Aboriginal people

know about Country and there is great value in involving Aboriginal groups at all levels of project development.

Renewable energy projects align well with traditional Aboriginal cultural values associated with sustainability. As such, there is a wider opportunity for Aboriginal Australians to have input into national, state and territory energy and sustainable development initiatives. But Aboriginal involvement needs to be more elemental than this, and should be incorporated into all facets of renewable energy development, including target-setting, policy-making, site selection, assessment criteria, engagement requirements and approval conditions.

It must be stressed that the damage to trust caused by the processes of colonisation, coupled with Western corporate and governmental economic imperatives, makes meaningful reconciliation between engineering companies and Aboriginal communities challenging. However, the suggested 'right way' solutions provided the Warrigal Downs hypothetical case study have been replicated in best-practice examples elsewhere and/or already have a direct correlation to the ethical codes/cannons listed in Fig. 3.1.

We can, therefore, begin to suggest a model for engineers to work with Aboriginal communities which links ethics with best practice. Table 3.1 suggests a model for engineering professionals and Aboriginal communities to work together which is regardful of Country, consultation, inclusion and self-determination.

3.6   Conclusion

The authors of this paper have drawn on their experience as Aboriginal community members and educators, professional engineers and university faculty to look at the intersection of energy engineering with two tenets of Aboriginal culture—connection to Country and community inclusion in decision-making.

The challenges are complex and require engineering project developers to move away from a silo-ed view of Aboriginal cultural heritage beyond being it treated as another 'issue' or 'impact' requiring 'assessment' through a jurisdiction's statutory environmental and planning processes.

All stages of planning and development in an energy (or other) engineering project should be underpinned by respect for Aboriginal and other Indigenous peoples. Respect arguably needs to start in the formative years of a future engineer's schooling, but particularly at university where students are taught to see Aboriginal cultural heritage and engagement not simply as an 'issue' or 'constraint', but as an opportunity. Engineering students should be taught about Aboriginal concepts of Country and outline the benefits of involving Aboriginal communities in all stages of project planning and development. They should also be taught about the importance of Traditional Owners' insights and knowledge—demonstrating cultural respect.

Consider that Aboriginal people do not necessarily need an engineering model to tell them where the best location to place renewable energy might be. Consider that Aboriginal people may not need to be qualified ecologists to know how to best avoid

Table 3.1 Warrigal downs: model for working together

Principle	Links to ethical documents	Practice
Remember the sanctity of working on Country for Aboriginal peoples and humanity	United Nations Declaration on the Rights of Indigenous Peoples (Article 8, 10, 29, 32) The Burra Charter (Article 3) Engineers Australia Code of Ethics 4.3 (Engineers Australia 2018)	Minimise lasting damage to land. Consider the impact on native flora and vegetation Provide sustainable solutions
Respect for country—traditional knowledges and two-way learning	United Nations Declaration on the Rights of Indigenous Peoples (Article 18) The Burra Charter (Article 4) Engineers Australia Code of Ethics 1.3, 4.2	Take time to work with Aboriginal people on Country. Engineers, planners and environmental scientists working with communities who hold traditional knowledge Work with custodians to identify cultural and ecologically significant sites Conduct more research to utilise tradition knowledge in modern applications
Give voice to Aboriginal peoples, recognising right to self-determination	Universal declaration of Human rights (Article 27, 29) United Nations Declaration on the Rights of Indigenous Peoples (Article 3,4, 23) The Burra Charter (Article 2) Engineers Australia Code of Ethics 1.2, 4.1	Work with traditional owners to locate suitable locations to consider cultural and ecological impacts Fully disclose purpose, detriments and benefits of any project Allow right of veto Regime shift to community ownership where possible
Act with respect—listen	United Nations Declaration on the Rights of Indigenous Peoples (Article 19) The Burra Charter (Article 7)	Engage early, regularly and respectfully Consider communication and cultural protocols related to the message Talk to the right person and make information meaningful so consent is truly informed Ensure all who interact with Aboriginal communities are given cultural training
Ensure appropriate remuneration; compensation and right to profit from engineering projects	United Nations Declaration on the Rights of Indigenous Peoples (Article 28) Engineering company rReconciliation Action Plans (e.g. Engineers Without Borders Reconciliation Action Plan 2013–2015) (EWB 2019)	Consider job training and opportunities; providing new amenities or educational opportunities to communities and individuals. Consider, also, a share of profits
Take time to understand culture	The Burra Charter (Article 6) University Graduate Qualities (As defined in Universities Australia 2011)	Work collaboratively, taking into consideration language and decision-making processes

important environmental areas; and consider that Aboriginal people may not need to be qualified hydrologists to know the pathway of water drainage across a landscape. This is not to say that thorough environmental studies should not be undertaken for a project, more that there are different ways of addressing how a project may impact upon any given site.

Despite the decimation through colonisation, Aboriginal people continue to fight for the survival of their culture which remains intrinsically bound to Country. They also continue to fight for their right to be included in decision-making in all developments which are often imposed upon them.

However difficult, working together is possible where there is a due regard for the cultural leadership and knowledge of Aboriginal people in projects which impact upon Country and community. We hope, in the collaborative writing of this paper and case study, we have modelled Reconciliation-in-action and provided a practical, ethical framework for energy engineers working with Aboriginal and other First Nations communities.

> *There is no starting point or endpoint in a circle and therefore all things in the circle have an equal and valid place where there is no 'other' but you are recognised as 'another'.*
> *Karen Martin* (2008) *Noonuccal, Quandamoopah and Bidjara woman*

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Chapter 4
The Kazakh Ethical Tradition and Anti-nuclear Ethics

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Abstract The article analyses the contribution of the Kazakh traditional ethics to the formation of a modern harmonious world. The peaceful and harmonizing nature of the philosophical ethics of various civilizations at different stages of history characterizes the diversity and unity of human aspirations for peace and harmony. The development of nuclear weapons in the modern world is a serious challenge to this concept of development. Ethical ideas of different nations can be used as a weighty argument in favour of the refusal of mankind from nuclear weapons. The authors focus on the harmonious worldview of the nomads, who understood the interconnectedness of the world of man and the world of nature.

4.1 Introduction

A tolerant and peaceful tradition of philosophizing has formed in the Kazakh spiritual culture, reflecting the people's dream of peace, freedom, well-being and fraternal interaction between nations. It seems, on the whole, that many years of colonial and postcolonial dependence has failed to erase the values of good, justice, peace

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and social optimism from the minds of people. A clear example of the enactment of these values was the decree of the First President of Kazakhstan, Nursultan Nazarbayev, to close the Semipalatinsk Test Nuclear Range on August 29, 1991, as we will elaborate throughout this chapter (Decree of the President 2016; Эрлан 2016; Einstein-Russel 1955). This arguably courageous political step was preceded by a broad anti-nuclear social movement "Nevada Semipalatinsk", initiated by the famous Kazakh poet Olzhas Suleimenov (2003). For Kazakhstan, the abandonment of nuclear tests and subsequently the complete abandonment of nuclear weapons meant a return to the peace-loving values of Kazakh people, finding genuine freedom to independently decide their own fate, free the vast Kazakh steppes from weapons, authoritarian Soviet violence and despotism. Such a growth of national and civil identity has become a key factor in the collapse of the Soviet Union (USSR).

The Kazakh ethical tradition, which can be said to inform the types of values articulated above, draws on understandings of ideological systems, value orientations, beliefs, mythopoeic and other spiritual and cultural manifestations of the people and its representatives. These have existed for many centuries, since the appearance of the ethnonym "Kazakh" in various Kazakh state formations on the territory of modern Kazakhstan, which formed the complex behavioural codes and representations that distinguish them from other nations. Against this background, this chapter first outlines the history and contemporary manifestations of such ethical approaches, before exploring their application to the case of nuclear energy. In so doing, it demonstrates the range of technological evaluations such an approach can allow and establishes a challenge for the adoption of traditional Kazakh philosophical concepts going forward into increasing modernization and international collaboration.

4.2   Kazakh Philosophy

In general, the emergence of global social structures relies on the processes of changing, adapting new norms, formulating, propaganda, dissemination and colliding with opposing or other ethical norms found in the codes of honour of other countries and peoples. The Kazakh tradition has experienced a variety of such interactions, colliding with notions of "Zhasau izi" from Yassa Genghis Khan and "Zheti Zhargy", or the "Seven Laws of Tauke Khan" as it is otherwise known. "Zheti Zhargy" is the code of customary laws of the Kazakhs, adopted in the Kazakh Khanate under Khan Tauke (1655–1715) (Nusupbekov 1979: 334–341). Within this section of our chapter, we focus on seven particular principles that delineate a Kazakh's philosophical perspective.

In these codes and in the Kazakh language, there are many words denoting a worthy person, or a man of honour. The sages of the Kazakh steppeswere seen to be carriers of universal traits that manifest themselves in various facets of reality. Nomadic Kazakhs called such people "Segiz Kırly, Byr Syrly", "multi-faceted persons", literally meaning that they had eight faces and one base. This type of person-

ality would possess special ethical qualities such as "danagoy" (striving for wisdom), "danyshpan" (sensible), "kemenger" (being rationally active), "oishyl" (a thinker), "parasatty" (understanding), "akyldy" (smart), "sanaly" (conscious), "bilgir" (knowing), "tarbiyeli" (well educated), "dyrys" (correct), "on" (exact), "talapty" (purposeful), "mandi" (meaningful), "belgili" (famous), "kutty" (fertile) and "kasi-etti" (gifted, talented). The emergence of these terms proves that from ancient times, in the discourse of Kazakh ethical culture formed an idea of a meaningful, virtuous, dignified life. These terms represent to us the value and content of the activities of wise people, respect for ordinary people not only to the wise word, but also to the conscious action and prudent decision.

A person of traditional Kazakh culture follows the unwritten rules that (1) the word is an action, (2) knowledge is an act, (3) morality is an assessment of life, (4) insight is good, (5) foresight is holiness and (6) talent and special qualities show her power. This power consists of achieving influence, the attention of people, authority, the ability to lead people behind them and to inspire them with some idea. Wisdom is courage—the ability to know and to speak the truth and to act according to her. Therefore, the wise men of the steppe, famous for their knowledge, words and actions, were in authority. Everyone turned to them for advice, from simple "sha-rua" (ordinary person, peasants) to the Khans. They were often near to the governor and at the same time they were autonomous and independent. Nomadic Kazakhs knew the hierarchy and followed this fine line.

The Sages of the Kazakh nomads are always free and independent people. They were able to tell the ruler the truth to their face and to express the aspirations of the people, not caring about their personal welfare and even life. Notable are the personalities of the philosophers Asan Kaygy, Bukhara Zhyrau, Makhambet, Tole bi, Kazdauysty Kazybek bi and Ayteke Bi, who possessed the courage of "Tura kөzkaras, Tura sөz", "direct sight, direct word", which rulers regarded.

The development of the Kazakh nomadic philosophical tradition is based on an understanding of the characteristics of its development. Nomadic Kazakhs represent non-stationary (i.e. dynamic) social groups with open systems of thought. They are able to integrate their various components, despite the different nature of their origin. This made it possible to engage with well-established ideological systems, whilst giving tribute and recognition to them and simultaneously being guided by habitual and adapted to nomadic life and life representations.

4.2.1 A Traditional Kazakh Ethical Code

The traditional Kazakh ethical code can be evidence by the adoption of Islam as the dominant worldview of the Kazakh nomads. In the works of famous nineteenth century first Kazakh orientalist Shokan Ualikhanov—and in the particular article "On Islam in the Steppe"—he points to the fact that the steppe people have a freer, independent spirit than the "Bukhara or Tatar mullahs" (Valikhanov 1985a: 293). The nomads, along with the observance of Muslim traditions, preserved the rites of

other ideological systems, such as Tengriism. So, the concept of "Tanir"/Tengri—Heaven—took root in the Kazakhs as a synonym for God-Allah. Animistic representations, that is, a belief in "aruakh"—spirits or impersonal natural forces—were also widespread amongst Kazakh nomads, and even amongst modern Kazakhs, representing an integral part of their national outlook despite the general identification of themselves as both Muslims and completely modern secular people.

In the context of this chapter, it is important to emphasize that a belief in spirits—ancestors or impersonal forces of nature—is transmitted on an intuitive, unconscious level in the context of transgeneration. It is also understood as a process and the formation of a new one, based on previous and transmitted experience. Aesthetic canons (Mukanov et al. 2017) and ethical rules, in spite of the experienced and current transformation, retain their original, naturally determined content. Thus, the ecological way of life of the nomads, in which their main advantage was to preserve the immutability and loyalty to Mother Nature, further determined their way of thinking and choice of a behavioural model under shifting social conditions. For the Kazakhs, these social and technological contextual challenges were, amongst others, forced sedentarization, collectivization, industrialization and the militarization of the territory including tests in the Kazakh steppe of the latest types of biological and nuclear weapons. In summary, the traditional values of the steppe people of the past still play out an important role in midren time. The essences of the seven principles of the Kazakh ethical code (Amrebayev 2015) were and are still used (Table 4.1).

All this ethical category can be interpreted at micro and macro levels: at the micro level, as a personal, associated with a purely human community, and at the macro level as immersed to the ideas about the world and nature.

The first principle "Ana Kurmetteu, Ana Sutin Aktau", or "Respecting the mother, the intention to justify the milk of the mother", is the greatest and very first principle that is accepted by those holding Kazakh philosophies. From one hand a man ought to preserve the moral and ethical qualities that were laid down by the mother and transferred as an ethical code. Every person should to live according to the mother's moral expectations. He must justify the milk of the mother, the gene that she passes to her baby. On the other hand, according to the ideas in the Turkic

Table 4.1 The seven principles of the Kazakh ethical code

Principle	Focus on
Respecting the mother	To be held worthy and meet the moral expectations of the community
Respecting the native hearth	Internal, community consistency
"Zheti ata"—to know by heart the names of your own seven ancestors in the male line	The preservation and transmission of the genealogical tradition
Serving the Fatherland	Bravery and fighting spirit
Sacred attitude to the word	Conscious harmonious communication
Hospitality	The value of human communication
Conscientiousness	Maintaining the honour and dignity of the person

nomadic culture, Umai-ene, the angel—spirit is the patron of mothers and pregnant women, which also had been associated with the native Earth-Water and protects everyone to be born. Therefore, each person should strive to justify the milk of Mother-Earth.

Secondly, the code stipulates respect for the native hearth. "Kara shanyrakty kurmetteu" or the ability to protect and to save your hearth. This is a focus on internal, community consistency, rootedness in the family. When the time comes and the sons leave the nest, create their families and raise their own "shanyraks". However, in the family hierarchy, in the minds of the Kazakhs, at the top is the father's "Kara Shanyrak". Sometimes "Kara Shanyrak" is associated with the historical homeland. In the Kazakh tradition, excommunication from a kind of tribe was a tragedy.

The third ethical principle is the requirement to preserve and transmit the tradition, continuity of honour and dignity of a person, enshrined in the code "Zheti ata"—people's knowledge about their seven ancestral tribes and their responsibility for the seven tribes of descendants. We always live in the space between the past and the future. We bear the stamp of the behaviour of our seven ancestors. If they were worthy, if they were honest, and if they honestly served their homeland, then they were honourably fixed in the ethical code of the clan-tribe. For example, your grandfather was the chairman of a collective farm, great-grandfather fought somewhere, great-grandfather was an assistant to some kind of khan, and so on. At the same time, this principle of the "Zheti Ata" also requires decent behaviour from us, because we are responsible for the next seven generations for the gene ethical history of the future. Because if we behave unworthily in society, then they will say about us: "He is a thief, a scoundrel!" In historical memory, it is recorded whoever committed an unworthy act and this seal is borne by their sons, grandsons and great-grandsons. Their social status will already be completely different; they will bear this black seal until they are straightened out. Therefore, I must be very careful about my behaviour, here and now, trying not to let other people down and trying to preserve my purity and fairness of my clan and ultimately national honour and dignity. No one wants her or his child to bear the debts of his father or mother or his ancestor. Kazakhs, when they bury a person, are always asked who will be responsible for the debts of the deceased, and then his son takes the debts upon himself. In an ethical sense, it is a very tense state that always makes one behave virtuously, that is, does not allow oneself to do something dark that could be imprinted on future generations. This connection of seven ancestors and seven descendants is alive and very important.

Along with the preservation of cultural continuity, the stability of the ethical tradition—"Ata Zholy", or following "the path of the ancestors"—remains as a kind of standard of high ethical behaviour. The introduction of new, modernized ethical canons is a rather complicated process that requires verification through time. You need to remember the traditions and canons and, at the same time, modernize them. Nevertheless, the essence and the main outline remains the same. No matter how we integrate, no matter how we perceive the modern information channels, we maintain contact with time and our people.

The fourth value is "Atamekendi suyu, atakonstsy korgau", or "Love of fatherland, protect the homeland". It means love for the Native land, the willingness to sacrifice oneself in the name of the Motherland. In Kazakh tradition, this is very clearly fixed. The Kazakhs, is a nomadic tribe, the people—the army—whose main occupation was constant combat capability, courage and fighting spirit. The Kazakhs are a militant nation, capable of standing up for itself.

The fifth value "Soz Kadyryn tusinu", or literally "understanding of the meaning and value of the word". This represents freedom of expression, a very sacred attitude to the word. Kazakhs say: "Are you responsible for your words?" This means to understand the meaning and significance of what you say. A word, as an act, is very important. In the traditional culture of the Kazakhs, the word can be both "a curse" ("kargys") and a blessing ("bata"). The word conveys not just information but also spirit to a person. We communicate, conduct internal dialogue and present ourselves thanks to the word.

The Kazakhs say: "You can cut off the head, but you cannot make someone fall silent." There were many facts in history when the sage was telling the truth to the Khan. Unfortunately, contemporary history has taught people to adapt, to tell lies and to live by a double standard. Hence, people think one thing, say another, and act in the third. During the Soviet Union reign or period, there was an ideologization, a collective dupe where the mind was flooded with political myths that the Soviet government spread. And in the Kazakh tradition this cannot be so.

The sixth principle is hospitality. The value of human communication is one of the most important for the Kazakhs. Kazakhs say "Adamnyn Kuni Adammen", "the life of a person with a person". No one can live outside society. There is a principle: "Taspen urse, aspen ur", "If someone throws a stone at you, give him a treat in return and everything will be restored". This is the understanding that you are not alone in life. You come into this life with crying, and with crying you leave and only decent human relations accompany you. There is not only a linear connection from the past to the future, but also actual branched social ties. We have, for example, this relationship "tuys-tugandar", meaning close relatives.

A "dzhigit" (young man) has three large groups of close relatives: "Oz Jurt" is his paternal relative, "Nagashy Jurt" the relative of his mother and "Kain Jurt" relative from his wife. And to each of them "dzhigit" has a special attitude, special rights, special communication and obligations. Senior-junior relationships are also regulated and ethically meaningful. There is the saying: "agasy bardin, zhagasy bar, inisi bardin tynysy bar", or "Who has an older brother, he has a support, who has a younger brother, he has a joy". The Kazakhs have an exceptional attitude towards the girl. "Kyz-konak"—they say "The girl is a guest". In her father's house she always sits in a place of honour, and the attitude towards her is very special and respectful.

All these roles and identities exist in parallel. There is some kind of dialogue to some kind of mutual understanding. There is such a moment as respect for individual freedom. There is the principle: "Oz Yerkini Ozine", that is, every person is free to do as he pleases without infringing on the rights and status of another person.

The seventh principle "ar-uyatyn saktau", or literally "save consciences". It means the preservation of the honour and dignity of the person himself, based on conscience.

All seven universal principles are inherent in Kazakh traditions, which can unite people, regardless of the income status, place of residence, means of communication and whether they classify themselves as having a traditional or modern outlook. These differences can merge and when we talk about social design, we are talking about building these bridges that bring different nations and states together to resolve common tasks.

4.2.2 Particularities of Nomadic Life-Style

The peculiarities of the nomadic lifestyle and its cultural and artistic potential are notable, and they have become the major sources of the formation of Kazakh worldview. There are several positive characteristics of the nomadic lifestyle. We focus here on "independence", "view on death" and "communication".

The nomadic Kazakh nation was integral to nature, and the determinate set of its nomadic life was the "human-nature" paradigm. The nomadic lifestyle was tightly connected with constant movement, and the movement represented the aspiration for improvement and constant renovation. The nomadic lifestyle has added the practical character to Kazakhs' way of life. The desire for the hoarding and the richness was alien to Kazakh nation. In contrast, the challenge of constant resettlement and the long and difficult task of migration from one place to another have led to the development of the characteristics of patience, mutual understanding, caring, ability to live in a community and discipline, amongst others. In the sedentary way of life, there tends to be a problem of ruling power, whilst in the nomadic community the relationships amongst people are regulated through traditions, customs and constant shifts. A nomadic person, in contrast to a settled person, remains a relatively independent individual in society.

The endless space of the nomadic lifestyle has become the basis of a particular culture, and of the distinctive arts of the Kazakhs and its high spiritual inspiration. Chokan Valikhanov, one of the first Kazakh scientists in the nineteenth century, has fairly stated that the poetic and conceptual spirit of nomadic Kazakhs was influenced by light-hearted nomadic life or by constant contemplation of the nature, by open stellar sky and boundless green steppes. He wrote: "The shaman man was amazed at the sun and worshiped him; I saw the moon and bowed to her; he bowed to everything in nature, where he noticed the presence of this inexplicable force, eternal as time, which he called the blue sky, Kok Tengri. The origin of shamanism is the adoration of nature in general and in particular" (Valikhanov 1985b: 50).

In our opinion, we can constructively use as a method the insight intuitively interpreted by Dilthey as a personal development. To understand is to experience personally, to reveal the vital connection of what is understood with the aggregate experience of a person's life (Nurysheva and Smirnova 2015: 4). So the main cate-

gory of the philosophic worldview of Kazakhs is life, "omir". Life is the most important value amongst the values surrounding a human being. Undoubtedly, it is the basis and the absolute pre-condition of all other values. Kazakhs, raising life and comparing it with death, stated: "Myn kungi tamyktan bir kungi jaryk", or "One day of light is more than thousand days of darkness"; "Oli arystannan tiri tyshkan", or "It's better to be a living mouse than a dead lion"; "Tiri adam tirshiligin jasaidy", or "A living man will live and create". In the understanding of the Kazakhs, a human being should live his life meaningfully, value each and every day, think about it as much as possible and always aspire for its development. The importance of this existential question about life is raised in almost all of the national songs. Listening to them, it is felt that Kazakhs were diligently calling the fellow countrymen on valuing life, fulfilling it with the meaning and were regretting that it is transient. To express their philosophic thoughts, Kazakhs were using the words of its rich and extremely beautiful language.

In the understanding of Kazakhs, only a human himself through his actions is able to fill his life with meaning. Kazakhs say: "Duniege eki kelmek jok", or literally "Do not come into this world twice", meaning he has been given with only one opportunity to be and only he himself is accountable for his life. The characteristics of life are also explained through the category "dunie" or "world". It should be stressed that the word "dunie" is applicable when explaining the objective reality (dunie-bolmys), the material richness (dunie-bailyk) or the surrounding reality (dunie-alem), but the main philosophical meaning of "dunie" is fully disclosed when characterizing life. The following word combinations "dunie-jalgan", "kum dunie", "ottin dunie" and "dunie-arman" perfectly reflect the relativity and shortness of life. These thoughts are particularly well expressed in "kara-olen"—the simplest way of a verbal creation of Kazakh nation. "Kara-olen" is a quatrain that was composed by every Kazakh. "Kara-olen" precisely reflects the everyday life of Kazakhs. From the first side, it might seem that in "Kara-olen" it is suggested to live a life-dunie effort, easily, in welfare and joy, but the philosophical thoughts of Kazakhs about life-dunie reflect another view. The Kazakh nation teaches to fill the life with effort, following the right satellite of life, with good friends and relatives.

The category that defines the meaning of life is death. In understanding the Kazakhs' way of life, death is a natural life phenomenon. It does not exist outside of life but is in the dialectical unity with it. Thus, death is perceived by Kazakhs in tight connection with the lived life of a human. Certainly, every person has a subjective fear of death, but Kazakhs rarely make the absolutization of death and the ignorance of life. In addition, there is no concept of life as being meaninglessness due to the existence of death. If life was meaningful, death cannot erase it. A person is only afraid of death if she was not able to fulfil her life with good actions and intentions. The great Kazakh poet Abay in a poem devoted to his son Abdrahman (Kunanbayev 1895), who passed away at very young age, stresses that it is important how he lived in his way, but not the fact that he died. The attitude of Kazakhs to death is strongly stressed in the thoughts of Kazakh commanders—"Batyrs"—who protected their territories form the enemies.

The category "aralasu", "communicating", reflects the relationship between the individual and the society, his ability to live in peace and understanding with his fellow countrymen and the representatives of the entire humanity. The human existence is itself always developing, changing and renovating the process of communication. A human being develops his personality only in the society, through communication, in the dialog of "I" with the "Other". A Kazakh nation has a striking aspiration for communication. It can be said that "aralasu" is itself the meaning of life for Kazakhs, and one of the highest values. It is thought that the reason for such aspiration to communication Kazakhs has developed from the nomadic lifestyle. The Kazakhs valued every moment of communication not only with their relatives and their countrymen, but also with all other representatives as well. The aspiration to the communication has been transmitted from one generation to another. The guests of Kazakh land always noted the hospitality, patience, deep emotional state and sincere purity of the thoughts of Kazakh people.

From the eighteenth century, Kazakhs were involved in the orbit of Russian politics. During the twentieth century, the Kazakhs were involved in all historical events related to the creation, functioning and disintegration of the USSR. The wide social programs of the Bolsheviks, promising economic, political and national freedoms, in fact, turned into several tragedies for the entire population of Kazakhstan. Along with tremendous social achievements (in education, health, urban development, etc.), Kazakhstan was a platform for social experimentation (forced sedentarization, famine 1931–1932, repression 1937, creation of a testing ground in Semipalatinsk) during the totalitarian period of the Soviet regime. An objective study and assessment of historical events became possible only with the beginning of the Independence of the Republic of Kazakhstan since December 1991. Comprehension and philosophical reflection of these events is still in progress and not completed.

4.3   The Case of Nuclear Policy

Kazakhstan, which has gone from being the owner of the fourth nuclear arsenal in the world to the leading country in the field of nuclear disarmament and the non-proliferation of nuclear weapons, makes a significant contribution in the area of international relations and nuclear policy. Arguably, Kazakhstan is a leader in the world's anti-nuclear movement and has thus proved strict adherence to the principles of the peaceful coexistence of nations.

Today, the traditions of harmony, continuity of the Kazakh nomadic wisdom, can be observed in framework of modern ideological innovations. One of the central ideologies of the development of the people is inter-ethnic harmony and peace between the peoples of the country, manifesting as the ideology of non-violence and the preference for compromise in international affairs. In this vein, some consider that Kazakhstan has become a platform for dialogue on a variety of the top issues of today. As an example, there are initiatives to convene the Congress of Leaders of World and Traditional Religions, a platform for dialogue on the Syrian settlement,

and the Presidents of Kazakhstan and the United States agreed to create the only Central Asian training centre on nuclear safety.

On March 2, 2018, in New York, on the day of the celebration of the next 26th anniversary of Kazakhstan's accession to the United Nations, the Republic of Kazakhstan held the official signing ceremony of the Treaty on the Prohibition of Nuclear Weapons (TPNW). This event symbolized the institutional consolidation of the peaceful aspirations of the Kazakh people. The agreement was signed by the Permanent Representative of Kazakhstan to the UN, Kairat Umarov, in accordance with the powers granted to him by Presidential Decree Nursultan Nazarbayev No. 617 in January 9, 2018 (https://www.inform.kz 2018).

The Treaty on the Prohibition of Nuclear Weapons was adopted on July 7, 2017, with the support of 122 UN member states. This document was the outcome of two negotiation sessions of the UN Conference, both of which combined to establish legally binding instruments on the prohibition of nuclear weapons, with the aim of securing their complete destruction. Despite this global peace initiative, the nine states, de facto and de jure possessing nuclear weapons—the countries of the so-called Nuclear Club, including the USA, Russia, China, Great Britain, France, India, Pakistan, North Korea and Israel and their allies—boycotted to initiative. To date, 56 States have signed the Treaty, 5 of which have been ratified. Kazakhstan has become the 57th signatory state. The document comes into force 90 days after the deposit of the 50th instrument of ratification. Thus, by participating in the Organization of the Comprehensive Nuclear-Test-Ban Treaty (OCNTBT), Kazakhstan is taking an active part in the anti-nuclear movement.

4.3.1   Case 1: The Semipalatinsk Nuclear Test Site

For the first time in the world—at the end of World War II on July 16, 1945, at 5.30 am near the Alamogordo settlement (New Mexico, USA)—a nuclear explosive weapon with a capacity of 20 thousand tons of TNT equivalent was tested. On the 6th and 9th of August, 1945, respectively, the Americans dropped two atomic bombs on the Japanese cities of Hiroshima and Nagasaki. As a result, they were virtually erased from the face of the earth; their populations of a total of 145 thousand people were destroyed. After these barbarous steps, the USSR took up the development of its nuclear program. This marked the beginning of an era of nuclear confrontation between great global powers (Z.G Saktaganova 2012).

In the beginning of 1946, the USSR actually began organizing its infrastructure with a view to US nuclear confrontation. It created specialized management structures under the government, as well as scientific, industrial and laboratory complexes whose tasks included searching for, mining and processing uranium ores, developing technology and manufacturing fissionable materials as well as atomic bomb structures. The development of nuclear weapons was led by the scientific and technical council of the First Main Directorate under the USSR Council of Ministers. In 1946, a nuclear centre (KB-11) was organized in Arzamas-16 near the city of

Gorky (Nizhny Novgorod), where a group of scientists led by Yu. B. Khariton was engaged in scientific research leading to the creation of nuclear weapons. In August 1947, the Decree of the Council of Ministers of the USSR made a decision to create an atomic test site under the code name "Training site No. 2".

For the construction of the waste repository at Training site No. 2, an area 140 km west of the city of Semipalatinsk (on the territory of modern Kazakhstan) was chosen. It was surrounded from the south, west and north by low mountains, remote from large settlements, and had the necessary transport infrastructure. The Semipalatinsk Nuclear Test Site (SNTS) included the lands of three regions: Semipalatinsk, Pavlodar and Karaganda. Under the site, a total of 18,000 m^2 was withdrawn from the economic turnover. One of the main stages associated with the creation of a nuclear weapon is the stage of its field testing. The tests were carried out not only to study the damaging factors of nuclear explosions, but also to determine the main characteristics of the charge, to check the correctness of theoretical calculations and to confirm the full suitability of the ammunition necessary in case of emergency.

At the same time, the decision of the Kremlin government did not take into account the needs and interests of the local Kazakh population, who had become hostage to the authoritarian policies of the Soviet state. The Stalinist government showed its inhuman essence.

As a result of the mobilization of human, financial and technical resources, as well as tough organizational control by the ruling party and the military-industrial complex of the USSR, in the space of 2 years Kazakhstan built the Semipalatinsk Nuclear Test Site, the second in the world. At the end of July 1949, the State Commission accepted the test site, determining its readiness for nuclear testing. The first ground-based nuclear test in the USSR took place on August 29, 1949, at 7 o'clock in the morning; the height of the explosion of the charge was 38 m above the ground, the capacity of 20 thousand tons of TNT, the wind speed of 40–50 km/h.

The program of the first atomic test in the USSR, formulated in Government Decree No. 2142-564 of June 19, 1947, was focused mainly on solving two main tasks: (1) evaluating the design of a nuclear charge and (2) obtaining the data necessary to study the effects of a new weapon on various military facilities, installations and animals. Despite the fact that the SNTS was the main nuclear test site of the USSR, it was not intended for the production of high-power explosions and as a result, did not suggest measures for the comprehensive protection of the adjacent territories' population from contamination due to nuclear explosions.

The volume and depth of exposure to radioactive materials depended on the strength and direction of the wind during ground tests. For example, the explosion on November 22, 1955, was the most powerful in the history of testing nuclear weapons at the Semipalatinsk Test Site. When using charges in the megaton class, it showed that it is very difficult to ensure general safety and, crucially, to exclude the possibility of causing defects to various structures in the areas adjacent to the test site as a result of shock waves. Clearly, the territory of the Semipalatinsk Test Site was not adapted to conduct high-power explosions. On November 22, 1955, a RDS-37 thermonuclear bomb was tested at an altitude of about 2 km as it was

dropped by an aircraft. On October 11, 1961, the first underground nuclear explosion in the USSR was carried out at the test site.

From 1949 to 1989, at least 468 nuclear tests were carried out at Semipalatinsk, in which at least 616 nuclear and thermonuclear devices were detonated, including 125 atmospheric (26 ground, 91 aerial, 8 high-altitudes) and 343 nuclear test explosions underground (of which 215 in the tunnels and 128 in the wells). Dozens of hydronuclear and hydrodynamic tests were also conducted (the so-called NCR—incomplete chain reactions). The International Nuclear Test Ban Treaty (which applied to the three environments of air, space and under water) was signed on October 10, 1963, in Moscow between the USSR, the USA and Great Britain. After this, only underground explosions began to take place at the test site.

The total capacity of the nuclear charges tested in the period from 1949 to 1963 at the Semipalatinsk Test Site was 2500 times higher than the power of the atomic bomb dropped on Hiroshima. The radioactive clouds of 55 air and ground explosions and the gas fraction of 169 underground tests went beyond the site. It was these 224 explosions that caused the radioactive pollution of the entire eastern part of the territory of Kazakhstan. To this day, the country's population is experiencing the echoes of these tragedies through both the radioactive contamination of people and their descendants and irreplaceable damage to the environment, flora and fauna of the region.

In 1989, the famous Kazakhstani public figure poet Olzhas Suleimenov created the movement "Nevada-Semipalatinsk", bringing together victims of nuclear testing around the world. The last explosion at the site was carried out on October 19, 1989. On August 29, 1991, the Semipalatinsk Test Site was closed by the authorities of the Kazakh SSR. In order to eliminate the effects of nuclear tests, for more than 20 years, Kurchatov scientists continue to work on examining the territory of the former SNTS in order to accurately establish its real boundaries based on the scientific analysis of water, air and earth samples, testing for the presence of an increased radiation background.

The task is to identify contaminated sites in order to prevent the physical access of people and animals to them. And such sites are available not only in the territory of the site but also beyond. According to Erlan Batyrbekov, today, 7860 km^2 out of 18,000 km^2 of the landfill has been surveyed. These are mainly lands of the northern, western and south-eastern parts of the former landfill. The first stage of rehabilitation of the affected territories was the complete elimination of the entire military infrastructure of the landfill, which included the destruction of stockpiles of nuclear weapons and warheads, mines, mines prepared for underground explosions and much more. American scientists have already expressed a desire to take part in the work to eliminate the consequences of nuclear tests at this site, and since 2016, large-scale work has begun. Positively, the general director of the National Nuclear Centre of the Republic of Kazakhstan (NNC RK) noted that "hundreds of kilometres of land, the radiation background of which is quite normal, can be used for household needs" (Gulieyva 2016).

For the first time, scientific experiments have been launched in collaboration with scientists at Semey State Medical University. Their essence lies in the study of

radiation dust on biological organisms, using the subject of laboratory rats so that they can observe how it can penetrate into a living organism and with what consequences. It is radiation dust that is produced at one of the Kurchatov reactors.

In August 2015, as part of security provision in the SNTS, together with the National Guard of Kazakhstan and the United States Threat Reduction Agency, three levels of physical protection of all secret objects and objects of increased radiation hazard that are located here were tested. According to the results of testing, the National Nuclear Centre of the Republic of Kazakhstan received the highest rating from both Kazakhstani military services and their American counterparts.

The Semipalatinsk nuclear area is amongst the regions of the planet most affected by nuclear experiments. Today, the Semipalatinsk Test Site has become silent; nuclear charges have been removed from Kazakhstan and it has become a nuclear-free zone, but atomic bomb tests remain in the genes of people. Radiation has damaged their genetic code. The closure of the nuclear test site met the urgent needs of people who were forcibly held hostage by authoritarian political decisions. At the same time, it also symbolized the enduring philosophy of the life of the Kazakh people—the hope for the revival of life in the long-suffering land of Kazakhstan.

In general, in the Kazakh philosophical and ethical tradition, life has been granted to man from above, and the task of man is to fulfil the high humanistic mission of building relationships with each other. A Kazakh proverb says: "Adamnyn kuni adammen!", "The life of a man with a man!" It follows that no utilitarian geostrategic considerations can justify the cruelty and injustice of people towards each other. Another important aspect of the problem is the ecological attitude of the Kazakh nomads to the world around them. Here, the nomads, in accordance with the cyclical perception of the world, tried to leave nature as untouched as before their arrival. In contrast to the settled culture, the task was to leave behind not material, but spiritual artefacts of culture, a good memory in the hearts of people, high moral and ethical examples, ethical canons of decent behaviour and heroic deeds.

In accordance with these ethical foundations, the perception of the nuclear test site and tests, of course, was that of a national tragedy, a test similar to the era of "Zar-Zaman", or "the Age of sorrow", which represented the loss of nomadic life and thus the harmony of man and nature. The proving ground personified the onset of a technological civilization opposing the values of humanism. The creation of the testing ground by the Soviet government on the territory of the blessed Steppe was a challenge to the natural harmony and a kind of spiritual genocide against the people who lived there serenely. The cruelty of the Soviet regime towards the people was manifested in the fact that it did not even protect or warn them about the danger.

Unfortunately, the successors of the USSR, the modern Russian leadership, did not even apologize to the Kazakh people for the damage caused and did not take a single step to compensate the people and nature. Although there have been examples in history when states were rehabilitated in the eyes of the people, such as Germany apologizing to Israel for the genocide of the Jews during the Second World War, which indicates a high moral responsibility and moral standards of a modern civilized dormitory, this has not happened between Russia and the Kazakh people.

4.3.2 Case 2: Kazakhstan's Refusal of Nuclear Weapons

After the closure of the nuclear test site in Semipalatinsk, Kazakhstan faced a difficult dilemma: whether to preserve or abandon the arsenal of nuclear weapons. Geostrategic conditions spoke in favour of maintaining this weighty and forceful line of defence in a young country that had just gained independence. A number of sympathetic countries of the Muslim area, which perceived Kazakhstan as a kindred country, even offered support in maintaining the first "Muslim nuclear weapons". The President of Kazakhstan later said that after the collapse of the USSR, Kazakhstan had specialists, the necessary infrastructure for the introduction of military nuclear programs and the delivery systems. According to him two decades ago, the emergence of Kazakhstan as a new nuclear power was only a matter of political will and time. "But we showed political will and, in principle, unconditionally renounced membership in the nuclear club. Despite the tough opposition of the then Soviet leadership of the military-industrial complex, I signed a decree on the closure of the landfill. The day of August 29 became the point of record of the acquisition of the status of a region free of nuclear weapons throughout Central Asia" the president stressed (Zakon.kz 2012). The Head of State noted that Kazakhstan also voluntarily abandoned the world's fourth largest nuclear potential, inherited from the Soviet nuclear machine: "it was over a hundred ballistic missiles, with 1200 nuclear warheads capable of reaching any point on earth", Nazarbayev added.

In the context of global confrontation and international turbulence, high conflict potential and the desire to achieve the goal at any cost according to the Machiavellian strategy, Kazakhstan assumed a noble mission. It was the first to voluntarily give up a very weighty argument in world politics—the "nuclear club". Kazakhstan also symbolized the popular psychology of peace and the primacy of mutual understanding over the ideology of confrontation. For traditional nomads, the most important concept is self-esteem, which doesn't mean superiority over someone but rather the desire to establish a dialogue, to get to know another, to become a friend to him and to appease a guest.

In March 2016, at the anti-nuclear summit in Washington, Nazarbayev, the President of Kazakhstan announced the manifesto "The World. The 21st Century". The world media reported that according to the decision of the UN Secretary General Ban Ki-moon, the manifesto was given the high status of an official document of the two main organs of this world organization—the General Assembly and the Security Council. This was seen as a very important recognition of Kazakhstan's initiatives. In the emerging global anti-nuclear movement, Kazakhstan's manifesto "The World. The 21st Century" has become the main policy document for all member states of the United Nations.

The document describes that more than 60 years ago, outstanding scientists Albert Einstein and Bertrand Russell made a manifesto in which they formulated "a harsh, terrible, and inevitable question: should we destroy the human race, or should humanity give up wars?" (Einstein-Russel 1955). The great scientific minds of the twentieth century prophetically warned people that if nuclear weapons were used

without fail in a future world war, it would potentially destroy all life on the planet. Their warning that all disputes between states cannot and should not be resolved through war remains highly relevant in the twenty-first century. To eradicate war is the most difficult task of mankind. But mankind did not have any other reasonable alternative. This task should be considered by world leaders as an absolute priority compared to other issues on the global agenda.

In the twenty-first century, humanity needs to take decisive steps towards self-demilitarization. Otherwise, there is a stark but nonetheless realistic potential that the planet will turn into a repository for radioactive materials. Our planet is unique, we do not have another such planet and we never will. Therefore, mankind needs a comprehensive Program "21st century: a world without war" (Akorda.kz 2016).

4.3.3   Case 3: Nuclear Industry of Kazakhstan

Currently, about 80% of global uranium products are produced by five countries—Russia, Australia, Canada, Niger and Kazakhstan. According to the Minister of Energy Kanat Bozumbayev, Kazakhstan is the World leader on uranium mining and it covers 39% of requirements of world nuclear power. In 2016, the country produced 24,700 tons of uranium, which is 76% more than in 2009 (The Atomic Company "KazAtomProm" 2017).

Uranium extraction in Kazakhstan is carried out by 12 companies, including 11 joint ventures with Russia, China, France, Canada, Japan and Kyrgyzstan. At present, mined uranium in Kazakhstan is fully exported to other countries, and primarily to China. "The Kazatomprom enterprise includes joint ventures with companies from Canada, Japan, China, the Russian Federation, and the share of participation of the national company Kazatomprom is from 30 to 65%"—informed Minister of Energy of Kazakhstan Kanat Bozumbayev (Zakon.kz 2017). He recalled that there is no sale of uranium products in the domestic market.

The nuclear industry in Kazakhstan is one of the most promising resource sectors in terms of developing technological potential, both in the industry and in the country as a whole. Uranium is a strategic raw material for the nuclear power industry and has limited reserves. Positively, Kazakhstan has the second largest natural uranium reserve in the world, with 12% of all explored deposits. The country's reserves are estimated at more than 800 thousand tons, whilst the global total of reserves and resources is 1,4 million tons. This leaves Kazakhstan with significant competitive advantage over other countries. Moreover, it is noted that if this resource is managed rationally, in the next 50–80 years, Kazakhstan will have an advantage over economically developed countries, "where natural resources are less significant and are significantly exhausted", said the Minister of Energy Kanat Bozumbayev (Zakon. kz 2017).

In the Kazakh everyday consciousness, the dominant concept of "tirshilik" emerges, which means the requirement of existence in the name of continued life, meeting the needs of the family and children. For Kazakh nomads, the family is an

absolute value. "Balasyz uy mazar!" or "Without children, the home is a grave!" "Tirshilik" denotes the material existence of man, the survival in the harsh conditions of nomadic life. It relies on the spiritual basis of interpersonal relations, their moral and ethical content. The categories the "tirshilik" or "existence" and "omir" or "human being" are mutually connected. To exist physically means to be, to be held in a spiritual sense, i.e. meaningful, self-aware human activity.

4.3.4 Case 4: Nuclear Fuel Bank

In accordance with the Agreement of the International Atomic Energy Agency (IAEA), the President of Kazakhstan agreed to locate the Nuclear Fuel Bank in Kazakhstan (U.S. 2017). Situated in Eastern Kazakhstan and opened on August 29, 2017. Proponents advocated the creation of a repository as a vital security measure during the escalation of international tension regarding the proliferation of nuclear technology. It is envisaged that the Ulba Metallurgical Plant in Ust-Kamenogorsk, located near the Chinese border, will store 90 tons of low-grade enriched uranium. This amount of fuel is sufficient for one nuclear power plant to operate without interruption for about 3 years. The project cost is 150 million US dollars and was implemented with the financial support of the American billionaire Warren Buffett. Buffett contributed $50 million on the proviso that donor countries collected another $100 million. The USA allocated 49.5 million dollars; the European Union gave 29.1 million, the United Arab Emirates 10 million, Kuwait 10 million, Norway 5 million and Kazakhstan 400,000 dollars (Халабузарь 2017).

For Kazakhstan, the repository is a chance to win international benevolence and to strengthen the country's critical role in nuclear power. There are already a number of nuclear fuel banks in the world. One, created in 2010, is in neighboring Russia. Proponents of the project say that the IAEA's control over the Kazakhstan's repository ensures its neutrality, a vital element in the super-sensitive nuclear industry. Mohamed ElBaradei, Nobel Peace Prize winner and former head of the IAEA, said the new fuel bank was "a high point in the efforts of the international community to reduce the nuclear danger and strive to create a safer world" (Халабузарь 2017). Indeed, the presence of the Nuclear Fuel Bank in Kazakhstan actually helps to reduce nuclear tensions between countries, as it allows low-grade enriched uranium from the Bank in Kazakhstan to be used for peaceful purposes, without being suspected by international observers.

The topic of creating a bank in Kazakhstan for a long time has been a source of serious discussions in Kazakhstani society (Информационная система ПАРАГРАФ 2011). First, many have put an equal sign between a nuclear fuel bank and a nuclear waste storage. Secondly, there was no experience of implementing such projects on an international scale, although a number of banks of nuclear fuel were created in the world. Amongst the mechanisms of guaranteed supplies of low-enriched uranium, created with the approval of the IAEA, mention should be made, for example, of a guaranteed physical reserve of LEU of the Russian Federation

stored at the International Uranium Enrichment Centre in Angarsk and guaranteed provision of enrichment services for LEU in the UK. Own stock of LEU is also available in the USA. The IAEA experts believe that the site of the Ulba Metallurgical Plant, chosen as the location for the LEU bank, fully complies with safety criteria. The company has 60 years of experience with uranium hexafluoride (by 1986, up to 600 tons of low-enriched uranium dioxide powder and about 1000 tons of fuel pellets per year were produced here), appropriate infrastructure and qualified personnel and a reliable physical protection system. In addition, the Ulba Metallurgical Plant's IAEA safeguards regime has been operating for over 20 years. According to supporters of the project, the creation of the LEU bank will be an important step in the process of nuclear non-proliferation, and Kazakhstan will be a prominent participant in the peace initiative (Shaternikova 2019).

The nomadic Kazakhs not only strove for peace, but also reconciled other nations, always striving to create opportunities for good and sincere conversation. In Kazakh culture, there is a tradition of Asar—helping fellow tribesmen in building a house or supporting a difficult task.

Kazakhstan belongs to the category of countries that have decided to implement a nuclear energy program and are actively creating the necessary infrastructure.

Today, Kazakhstan has ratified a number of international agreements that allow to establish broad cooperation with the countries that are the main developers and suppliers of nuclear technologies (Karenov 2016: 20).

4.4   Conclusion

The modernization of the Kazakh society broke many of the threads that held the traditional clan communities together, but in the minds of the people, old paradigms are preserved and reproduced in a new way to answer new and current challenges. It seems that the current Kazakh challenge is how to use or adapt traditional Kazakh ethical principles to the tasks of social modernization whilst also being aware that globalization erodes cultures by unifying social standards and ethical norms.

It is the task of the national intelligentsia of our generation to adequately reconstruct and transmit the traditional ethical code and social ties, as mentioned above, and to create synergistic opportunities for young people to become involved in advanced models of culture and social development. It is hardly possible today to write a new national ethical code, to distribute it amongst people and to ensure that it is read. Instead, having studied the national, tribal traditions already approved by many generations of the Kazakhs, and noting their cultural embeddedness, it is more effective to use their positive principles to strengthen the nation today. Kazakhstan (as with many countries in the world) needs the modern ritualization of social life; modern national ethical traditions; informal, ethnically shaped social norms; and standards that would distinguish the country from other nations and strengthen its own unity. Global and comparative forms of philosophy, as set out in

this edited volume, can further exchange insights in how preserving strengths from ancient cultures locally and adapting and matching them with worldwide tendencies.

Today, it is important for the Kazakh nation to maintain self-awareness of a single family and pride in its own culture and history if it wants to stand in the face of global competition of ethical meanings. "Birlik bar zherde - tirlik bar", "In unity, strength and ability to act"—this is the formula for the Kazakh success. This formula was left to the Kazakh people by their ancestors, and they need to culturally convey it to their descendants.

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Part II
Energy Justice in Practice

Chapter 5
Energy Justice, Hydropower and Grid Systems in the Global South

Ruth Kruger and Darren McCauley

Abstract Grid systems are key focal points for energy debates in the Global South. Off- and on-grid realities, with a plethora of microgrid systems in between, exist simultaneously with differing under-explored consequences for rights, responsibilities, opportunities and constraints. We argue that a conceptualisation around macro- and micro-levels of justice helps to elucidate this complexity. A comparative philosophical approach ensues through a spatial exploration of justice in relation to the Democratic Republic of Congo (DRC) and the grid systems derived from hydropower. Original qualitative data is presented, analysed and reflected upon with concluding insights into conducting energy justice in the Global South.

5.1 Introduction

Energy justice is an evolving, outward-looking framework for understanding the justice implications of decisions across multiple energy systems, from provider to end user (McCauley et al. 2016, 2019; Walker et al. 2016; Bouzarovski and Simcock 2017). It is also built upon existing research agendas in the form of environmental and climate justice (Bickerstaff and Agyeman 2009; Walker 2009; Walker and Bulkeley 2006; Barrett 2012; Bulkeley et al. 2013), as well as more recent innovations in energy poverty (Bouzarovski and Herrero 2016; García Ochoa and Graizbord Ed 2016) and vulnerability (Bouzarovski et al. 2017a, b; Middlemiss and Gillard 2015) research. Energy justice is considered outward looking because it engages in testing geographical thought alongside other competing disciplinary traditions such as legal studies (Guruswamy 2015), business (Hiteva and Sovacool 2017), political science (Jenkins et al. 2016; McCauley et al. 2018) and engineering

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(Heffron and McCauley 2014; McCauley et al. 2019). In recognition of its interdisciplinary roots and its initial adoption by legal studies (McCauley et al. 2013), it is defined as the application of rights across and within the various system components of energy provision and consumption (McCauley 2018). This chapter sets out why we need to include energy justice as a key component of research in the Global South through exploring comparatively its spatial dimensions in relation to energy and grid systems with empirical insights from hydropower and the Democratic Republic of Congo (DRC).

Energy justice originates from the more well-established literatures of environmental and climate justice (McCauley 2018). However, neither can sufficiently encapsulate emerging questions around equity and fairness with regard to current and future energy or grid systems. Environmental justice is more successfully a tool for activists (Fan 2006; Houston 2013; Schlosberg 2004). Its origins are closely related to social opposition against the siting of hazardous waste in the USA. Studies emerged in academia as opportunities to reflect upon the ways in which these injustices were resisted (Taylor 2000). Similar research has also emerged outside the USA, often focusing upon resistance movements including in Africa (Ako 2009), Europe (Slater and Pedersen 2009), South America (Urkidi and Walter 2011) and Southeast Asia (Hobson 2006). Early research in this area reveals the distributional injustices with regard to where environmental bads are sited (Taylor 2000). The research brought our attention to how companies and governments through planning processes located harmful infrastructure in areas of social deprivation or in close proximity to ethnic minority communities (Shrader-Frechette 1996). More recent literature has offered insight into decision-making processes that have been referred to as investigations of procedural justice (Hricko et al. 2014). Scholars realised in this way that the process around locating infrastructure were equally important as the final outcome.

The focus in environmental justice research is positioned at the intersection between social concern and ecological impacts. It is equally valid for other forms of research where the emphasis is placed outside land management issues. Climate justice emerged directly from this literature (Bulkeley et al. 2013; Harris et al. 2013; Olawuyi 2016). The focus of social movement-based resistance closely associated with environmental and climate justice is placed directly upon a much larger concern than individual environmental impacts (Russell 2015). Climate change is presented as an overriding meta-concern where social justice is juxtaposed with international climate negotiations (Lyster 2017), their implementation (Mathur et al. 2014) and the local consequences of rapid changes in climate (Bulkeley et al. 2014). Conceptually, this agenda brought a new spatial dimension to academic research in the form of misrecognition (Fisher 2015). It encouraged researchers to consider who is missing from our policies or decisions in response to climate change.

Energy justice, as a conceptual framework, begins with like-minded spatial conceptualisations such as proximity, due process and misrecognition. It is interested in exploring the full range of injustices as found in other justice-based research frameworks as outlined above in relation to environment and climate. It also shares similar

philosophical roots from liberalist thinkers such as John Rawls, Nancy Fraser, Iris Young and Amartya Sen. Energy justice engages explicitly with energy systems. This is a key additional component that makes energy justice a necessary framework for justice thinking when confronted with energy or grid systems. The energy component is inherently reflected upon through explicit connections with multiple components of one or more energy systems.

The chapter investigates the country case study of the Democratic Republic of Congo and the development of hydropower. It investigates the injustices that have emerged from the construction and maintenance of the Inga dam projects. The energy justice framework is applied to this case study. Our results are presented in the form of interviews and analysis. This is followed by a longer conceptual discussion and reflection beyond the DRC case. We conclude by arguing that theoretical accounts of justice threaten to bind energy justice researchers into pre-determined Western logics of justice (Barnett 2010; McCauley et al. 2019) in line with other contributions in this book (Pellegrini-Masini et al. 2019; Sanusi and Spahn 2019). We do not explicitly cover non-Western logics here—for this, we recommend further Sanusi and Spahn (2019) for a detailed exploration of an Ubuntu philosophical perspective on an African context. We rather argue that our current energy justice framework as applied here must grow further by integrating in such perspectives which is outside the scope of this current chapter.

5.2 From Old to New Spaces of Unfair Process in Energy Systems

The inclusion of affected communities in decisions surrounding major infrastructure must be accompanied by the equally important need to ensure an individual's broader capabilities within the context of an increasingly decentralised unregulated and unconventional energy system. This is especially the case in the Global South. Our chapter details such procedural injustices in the DRC through a comparative perspective with competing distributional and recognition forms of justice (for further detailed discussion on the energy justice framework, please see the Pellegrini-Masini et al. 2019).

5.2.1 Exclusion from Decision-Making

Affected communities have been found to be routinely excluded from decision-making processes with regard to the siting of energy infrastructure in and around their vicinity (McCauley et al. 2013). Spaces of undue process are already well established in environmental and climate justice research. The unjust distribution of power plants or waste facilities is directly correlated with an ineffective or even

absent process for including community organisations. Higginbotham et al. (2010) revealed that residents in the Upper Hunter, Australia, were routinely blocked from inputting crucial scientific data on air pollution as part of their protest against the state's promotion of coal production in the area, for example. Similar research has emphasised the lack of procedural mechanisms for including opposition and supportive voices for shale gas in the UK (Cotton et al. 2014). This space of injustice is characterised by non-inclusion in crucial decisions.

Currently research in procedural justice has been dominated by multiple case studies of wind energy. This reflects the broader changes in global energy systems (as well as a more Anglo-American dominance of literature as reflected upon below) towards investing in renewable energy sources. This has moved the debate on fair process from simply including itself towards reflections upon who is seeking to include and when this takes place. Warren and McFadyen (2010) demonstrated that local ownership of community wind farms secures a greater chance of social acceptance and incurs fewer instances of injustice. Ottinger et al. (2014) find, in contrast, that greater state involvement can lead to less opposition in the USA. Feelings of injustice on renewable energy are driven by the lack of informal recognition or appreciation of local livelihoods that are destroyed by some energy efficient projects (Yenneti and Day 2015). Spaces of unfair process in emerging energy systems are more complex, contextual, time sensitive and ripe to be explored in Global South contexts.

5.2.2   From Restrained to "Freed" Capabilities

The decentralised nature of renewable energy systems requires a new approach to including affected communities in infrastructural decision-making. In the examples raised above, the community is viewed as detached from their energy system, at least in terms of production and associated processes. Originating from Sen (1999), the capability approach sheds light on not only the basic desire to access energy, but also the wide range of capabilities that energy provides. Unconventional energy systems that do not require major infrastructure offer the potential for a much freer engagement for the traditionally understood consumer. Parag and Sovacool (2016) support this observation by suggesting that electricity markets are currently undergoing a process of redesign in order to deal with unconventional energy systems and smaller scale renewable systems.

This involves recognising the proliferation of small-scale, mini and off-grid energy systems in electricity markets. Reflection on the grid is crucial. While acknowledging that this provides an opportunity for individuals and communities to engage more with their energy systems, such a change can initiate new forms of injustices. The most productive areas of the world to investigate how such systems

generate different outcomes in energy are outside the EU and the USA, where communities routinely live with unconventional systems. Some communities in Nepal (Damgaard et al. 2017; Islar et al. 2017) have benefited from close proximity to energy sources. Without a national grid infrastructure, local communities rely upon small-scale energy renewable sources such as a shared biogas facility. Their proximity to the energy source has, to some extent, increased "their capabilities" (such as clean cooking, mobile charging) and greater senses of community. They are, however, dependent upon their own knowledge for maintaining their energy supply, and open to exploitation by companies (Islar et al. 2017). We move on to explore these new spaces of undue process in relation to our case study in the DRC.

5.3   Methods

This section will outline the research design, as well as the approach taken in data collection and analysis. Then, some background information on the study sites will be provided, so that their choice for this study can be better understood.

5.3.1   Research Design, Data Collection and Analysis

The research was conducted in 2017 and 2018 as a case study in the Democratic Republic of Congo (DRC). This case was chosen for the socio-economic problems faced and the challenges in energy production and access, where the DRC is currently planning the further development of a large grid-based hydroelectric energy project. The case study ran with a distinctly constructivist approach (Bryant 1995: 33). The lead researcher collected mainly qualitative data, although some quantitative data was collected in the DRC, and used a snowball sampling strategy (Bryman 2016: 424). Mixed methods were employed to enable understanding of the case in question in a bottom-up manner, while applying the lens of energy justice in line with the top-down approach. In this way, the studies saw an interplay of inductive and deductive reasoning, recognising that the relationship between theory and data is not linear (Glaser and Strauss 1967). More specifically, empirical data was collected at four study sites in the DRC along the Congo River (Kinshasa, Inga, Boma and Muanda). The methods employed were semi-structured interviews, focus groups, participant mapping, transect walks, participant observation and a baseline survey. Data was then analysed using open-ended qualitative coding of transcriptions and fieldwork records (Newing et al. 2011), and simple descriptive statistics relating to the baseline survey (Sirkin 2006).

5.3.2   Study Site Background: Democratic Republic of Congo

The Democratic Republic of Congo is a postcolonial state in Africa whose history of extreme European oppression left the country struggling with multiple political and socio-economic challenges (Hochschild 2006). It is a very poor country with a GDP of 456.1 USD in 2015 (WorldBank 2017b). It is also a country with insufficient systems to realise socio-economic rights (Kasongo 2014). In 2014, only 13.5% of the country's 81.6 million people had energy access (WorldBank 2017a).

Most of the country's energy comes from hydroelectric dams, specifically the two Inga dams on the Congo River in the west of the country (Kutelama 2004). The construction of a third dam is being planned, and the DRC is planning to have eight hydroelectric facilities at this site, producing 44,000 MW but needing 80 billion USD in funding, largely from external sources (Green et al. 2015). The electricity from these dams is fed into the grid and provided to people and industries along sparse transmission lines, which primarily deliver energy to the capital Kinshasa, some other urban centres in the west of the country and the large mining industries in the south (Krüger 2017). Some of the electricity is exported to other African countries, and in particular much of the electricity from the third dam will be bought by South Africa (Green et al. 2015).

Benefits from the Inga dams can be seen along the transmission lines of the grid. However, the dams also have a specific local impact, creating a complex pattern of benefits and ills that are distributed across a highly stratified and segregated society (Krüger 2017). People at Inga receive benefits such as free water and electricity, but still largely live in poverty and stand to be further impacted if they lose access to land through the development of the new dam.

5.4   Hydropower and Undue Process in the DRC

The DRC case study offers new unexplored insights into energy justice (Krüger 2017; McCauley et al. 2017). This section will present the results from the case study as it relates specifically to the energy justice framework and its grid positioning (reflected upon in detail in Sect. 5.5), while situating them within the energy justice framework.

5.4.1   Distributional Justice

Energy resources are unevenly spread throughout the world, and this must be acknowledged in considering distributional justice as some unevenness is geographically determined (Eames and Hunt 2013). In the DRC, energy resources centre on the Congo River, which holds the second most water of any river in the world. The

water level is also relatively constant, as the river is located partly south and partly north of the equator, so that there is always a section that is experiencing a rainy season. According to an energy company at Inga, the river has great potential for hydroelectricity, especially at the rapids between Matadi and Kinshasa where the Inga dams are located. Inga's firm bedrock adds to this to make it a focal point for hydrodams.

The energy potential of the Inga dams is such that they provide much of the electricity in the DRC through the grid in the west of the country, according to an NGO worker who cautioned, "If the dam stopped you would see the consequence". Their importance is thus keenly felt, and this translates to a level of pride that Congolese people feel in the dams. In particular the impact that their energy could have through a region grid is a point of pride, and this perceived position of the dams was expressed by the focus group at Inga,

> The current development depends on electric energy. There is Africa. There is the DRC itself, which is waiting for electric energy. There is Africa. There is the world, even Europe. The World that needs electricity today. It's among the reasons that Inga 3, 4, 5, until 8, must be constructed.

Despite the potentially wide reach of the dams' electricity, its distribution is not even but rather dictated by economic necessities. This is particularly obvious in the case of the new dam, where the DRC has signed an agreement with South Africa so that this country will buy more than half of the new electricity. This may appear paradoxical, given the contrast between South Africa as a regional hegemon and the DRC with its energy access of 13.5%. However, according to the director of the DRC's energy company, this agreement is necessary so that the country can repay its loans in building the new dam, knowing that the Congolese populace is largely too poor to buy electricity.

Our empirical data suggests that local people at Inga, and in the DRC more generally, were largely understanding of the fact that South Africa is to receive this electricity, in view of their country's economic reality. However, the fisher focus group expressed the sentiment that they would also like to see benefits, stating, "If you were cooking, and you gave us something to eat but you had nothing yourself. Is that just? It's not just."

Similarly, the focus on energy use for industry within national borders is seen as justified as a connection is assumed between energy and development. This was made explicit by a participant in the youth focus group who stated, "Where there is a lack of energy, it's under-developed." The national benefit of industrial activities was emphasised by a focus group of cultivators, who also highlighted the geographic dependence of both industry and energy production, stating,

> It's good though (that the energy is sent to the mines), because the factories are in our country. Those factories are not in Congo Central (the province surrounding Inga). Seeing as they are found in another province, the electricity must go there. It's the interior of our country.

However, study participants were less understanding of the distributional unevenness of household energy access, in terms of both space- and time-based coverage.

A particular grievance was often expressed related to the lack of grid access in village electrification, and this was further connected to practical social and environmental difficulties related to rural-urban migration. According to the energy company director, however, village electrification is limited by local buying power in much the same way as is seen on the national scale. A time-based grievance that many study participants complained about was the scheduled electricity cuts designed to spread the burden of an over-stretched grid. In particular, local people at Inga felt that they should not be subject to these cuts. A focus group of hunters at Inga expressed this as follows, "We are at the source. We can't see the deslestages. It's the worst thing that frustrates the bodies of the people who live here."

Despite electricity cuts, those who live at Inga, or "in the cooking pot" as the fisher focus group had it, do receive some benefits. All residents of Inga town receive electricity and water free of charge, and most receive free housing too. However, survey results indicated that these services differ greatly in quality depending on the section of Inga. Energy company workers live in brick houses, with reliable access to water and electricity, without cuts. In a larger settlement of economic migrants and specifically people who worked on the construction of the dams, people live in clapboard houses and receive electricity only according to a schedule, as well as water of disputed quality.

In summary, the Inga dams have great potential to contribute to the national and regional electricity grid, but this is heavily constrained by the political and economic positioning of the DRC. The physical siting of grid infrastructure has been determined based on national priorities, but perpetuates uneven patterns of energy distribution. On a local level, there are co-benefits from the project, but these also follow an established and uneven pattern of distribution angled towards more powerful economic actors.

5.4.2   Recognition Justice

In order to understand the justice dynamics at play in the case of the Inga dams, it is necessary also to consider who is recognised within official processes, as the grid separates those who produce energy from those who use it, and more specifically also from those who may be affected by this production. In the DRC there is a specific legal framework for recognition of traditional land right-holders, which attaches quite clearly to the Inga dam project due to its size, impact and importance, both in physical space and in official discourse. Traditional land right-holders have been consulted about dam developments at times, although they do not feel this is sufficient. When a focus group was held among *ayant-droits* in a village near Inga, a participant stated, "The Chinese just arrived. Did we solicit their services? No! They just arrived, without being asked by the ayant-droits! Look at what our state is busy doing. It doesn't contact the ayant-droits!"

Beyond consultation, the *ayant-droits* receive special benefits such as free medical care and education, and some food every year. However, the *ayant-droits*

themselves do not view this as true benefit, as they still largely live in unemployment and poverty while the largest energy project in the DRC is situated on land that is historically theirs. During the focus group of *ayant-droits*, the following statement was made, with specific reference to the house of the chief of the *ayant-droits*, a collapsing clapboard structure:

> We are in colonialism because we do not benefit at all. People come to exploit, they enrich themselves. But we, who are the officials, we don't gain anything. We are in total poverty. Look at the house of the representative of the ayant-droits. How? This is the residence of the ayant-droits. Look. This is total negligence.

Thus, while official recognition of local people that may be affected by the dam project exists, it is limited for the *ayant-droits*. Further, it is limited to the *ayant-droits*. While only 10% of the people surveyed were *ayant-droits*, there is no official system to recognise others living at Inga who may be affected by the energy project.

This gap in recognition may be part of the reason that there is currently significant disjuncture between the needs of local people and how the energy company understands these. One example is that the dredging activities necessary for dam function interfere with fishers' livelihoods, but the energy company meets their concerns with disdain. Another example is a misunderstanding about what local people stand to lose when the new dam is constructed. The energy company does not feel much will be lost, "just fields", and is planning to compensate accordingly. However, traditional land-use practices are semi-nomadic so that fields may periodically become settlements. In addition, the poverty of people at Inga means that the vast majority are directly dependent on natural resources. The new dam development may impact significantly on their livelihoods, and this must be recognised by the energy company if local people are not to face injustice.

In this way, the dam project forms a platform for the recognition of traditional land rights, which could enable redress for inequalities initiated through colonial oppression. However, this policy may be insufficient to accommodate the current community at Inga. People that stand to be affected by the dam project are insufficiently recognised at Inga, and this could be the root of various practical social problems connected both to the existing dams and the planned dam.

5.4.3 Procedural Justice

Much as is seen with recognition justice, grid separation means that people affected by energy production may not automatically be included in its processes, and this may affect how benefits and ills are distributed. Special consideration is necessary to ensure procedural justice. This was not seen in the construction of the first two Inga dams, and this may be part of the reason for the distributional injustices detailed above. In this case, procedural justice is closely connected to the realisation of socio-economic rights, and its lack may cause further problems in the construction

of the new dam. Affected people have not been included in the relevant processes yet, and this is causing great distress. A focus group of women at Inga expressed this as follows,

> *If one chases us from here, will we still make fields where we go? Will we have houses there? How will we live there? Also, we will abandon our fields, abandon our fruit trees, and many things.*

Local people are further connecting these concerns to specific suggestions for how they may be addressed. Many study participants spoke about wanting to be included in processes surrounding the dam construction, "around the same table". According to the vice president of a community group representing those to be affected by the new dam project, this must stretch beyond the inclusion of the *ayant-droits*:

> *Like the ayant-droits who will be displaced, us too, we will be displaced. We have two groups. When they are speaking to the ayant-droits, at that moment, we the non-ayant droits must be able to discuss also.*

In this way, procedural inclusion is both connected to socio-economic rights and constitutes a right in and of itself. This right is recognised by the energy company, which has an official planning document, requiring consideration of social and environmental impact, and is planning to consult affected people. However, we remain uncertain when this consultation will happen and who will be included.

This situation is disempowering to local people at Inga. Their rights to procedural justice are at least partially recognised by the energy company and the state, but they must wait for these actors to give effect to them. Further, and connectedly, they have constitutionally protected socio-economic rights such as energy access (DRC 2005), but must wait for the state to be able to grant these from within a position of postcolonial poverty and dependence (Hochschild 2006). The responsibility is entirely with the state and the state-owned energy company, and local people are aware of this. The fisher focus group stated,

> *If you want to look for fish, where will you go? To the fishers. But if the fisher say today that they do not have any fish anymore, there are no fish, where will you go? (The energy company) can't tell us that there is no transformer for electricity. It's (the energy company's) responsibility to find a solution.*

While the technical competence mentioned here is not all that is necessary to enable energy access, it is an important component and here the energy company is better placed than the people depending on it. In the postcolonial context of the DRC, there are clear limits to resources, but the large project of the Inga dams has enabled the involvement of various international companies. The project enables the centralisation of resources and skills. However, the involvement of such private actors also brings with it further difficulties. Funding is commonly provided through loans that must be paid back with interest, and the international companies working at Inga commonly bring their own workers so that skills transfer is limited. While the Congolese state has the full responsibility of enabling energy access, it is also constrained within its post-coloniality (Young 2001: 57).

In this way, the concepts of rights and responsibility are central to procedural justice. In the case of the Inga dams, procedural rights are partially recognised, but surrounded by uncertainty, and this is disempowering to local people. The state has the power and the responsibility, but is constrained in the translation of procedural rights to socio-economic rights.

5.5 Discussion: Macro and Micro-levels' Justice

There are clearly justice issues here, and the energy justice lens helps to identify these. The findings highlight key issues in the establishment of renewable energy systems, in which justice is as important as effectiveness for sustainability. We argue that justice must be considered both on a macro level, in choosing an energy system, and on a micro level. Below, the findings of this study will be discussed in terms of their relevance to justice on both levels.

5.5.1 Macro-level Justice

Both grid-based and off-grid energy systems may face distributional justice concerns. In grid-based systems, energy access depends on grid access, or more particularly access to transmission infrastructure. This infrastructure is expensive to build, so that it presents a particular barrier to energy access in poorer postcolonial contexts, where energy access is still most limited. As seen in the Inga case, such infrastructure is likely to be built according to national priorities such as urban areas and industry, and the lasting nature of infrastructure may perpetuate inequalities.

Off-grid systems, by contrast, do not necessitate transmission infrastructure, but do still rely on technological resources and skills. In rural areas without energy access, poverty means that people must rely on an external actor for these, as was seen with the energy company. Distributional inequities will rest not on transmission infrastructure but rather on the activity and priorities of an external actor.

It follows that energy systems cannot be preferred for a socially just transition based solely on grid positioning, despite the links drawn between off-grid systems and justice in a recent paper (Damgaard et al. 2017). Additional factors must be considered. The Inga case demonstrates that one of these factors is the question of what the energy is to be used for (see Table 5.1). While household energy access has been clearly linked to development (Martínez and Ebenhack 2008), industrial expansion must form part of a just transition in postcolonial countries still struggling to fulfil socio-economic rights and gain true political sovereignty (Kasongo 2014; Power et al. 2016). This is necessary for greater economic equality on an international level, and also for global energy justice.

The Inga case in particular highlights the importance of industry in the DRC, while demonstrating its particular concerns. Energy resources are unevenly spread

Table 5.1 Opportunities and constraints of energy creation for industrial and household use, based on grid positioning

	Industry		Household use	
	Opportunities	Constraints	Opportunities	Constraints
Grid-based	Linkages between geographically separate energy and industry hotspots	Dependent on transmission infrastructure	Linkages between geographically separate energy and population hotspots	Dependent on transmission infrastructure
	Industrial expansion in postcolonial context	Difficult to meet grid's need for greater resources and skills in postcolonial context	Direct link between household energy access and development	Difficult to meet grid's need for greater resources and skills in postcolonial context
Off-grid	Self-sufficiency without need for transmission infrastructure	Limited to generation using local energy resources, which may be insufficient for industrial processes	Household self-sufficiency without need for transmission infrastructure	Limited by access to external actors providing resources and expertise

throughout the world according to the physical geography of a region (Eames and Hunt 2013), and this is further true of industrial resources. In the Inga case, the best site for hydroelectricity is in one part of the country, while resources to be mined are in another. Mining operations need large amounts of energy, and this means that a grid connection is necessary.

Similarly, the grid is used in the Inga case to link urban areas of high electricity use to the best site for hydroelectricity generation. Grid-based energy systems are useful in electrifying areas of national priority, where large electricity needs are not matched by energy resources. However, the flip side to this is that non-priority areas, such as rural villages, are not electrified. This presents clear distributional injustice (see Table 5.1). While these localised systems still depend on their geographical context like all energy systems (Szabó et al. 2011; Walker et al. 2015), the resources needed for the biogas are present wherever there are human settlements.

It follows that grid-based energy systems can be used to overcome geographical unevenness in resources and have a particular role to play in industrial development linked to socio-economic justice outcomes. By contrast, off-grid energy systems may promote household energy access in areas not reached by the grid for political or geographical reasons. In the development of renewable energies on a macro level, there is a need for energy justice to be applied not just to the energy mix, but also to the energy systems mix. The energy systems mix must be complex and context specific, while considering national development priorities for global energy justice.

5.5.2 Micro-level Justice

Above, it is suggested that both grid-based and off-grid energy have a role to play in a renewable energy system for a just transition. However, both face justice challenges. It is useful to consider not just what the energy systems mix should look like, but also what mechanisms should be used for its functioning. Both the question of who is involved (related largely to recognition justice) and how they are involved (largely procedural justice) are relevant to justice, and here some useful distinctions can be made based on grid positioning (see Table 5.2).

Grid-based systems, by their very nature, separate energy producers from energy users, and also from those who may be affected by this production. This may have distributional benefits, allowing for equitable energy distribution despite geographical unevenness. However, it also means that systems must be created so that those who are affected by energy production can have some control over decisions made by energy producers. This is essentially the basis for calls for recognition justice, which have traditionally been made in connection with grid-based systems (Islar 2013; Moritz 2012; Szasz 1994). The dynamics has traditionally been couched in rights terminology, with the state and energy companies having the responsibility to fulfil affected peoples' rights to fair and inclusive policies (London 2003; Owoeye 2016). The relationship is a reflection of the power dynamics in a particular situation. More specifically, it may signify a situation of disempowerment, much as was seen at Inga where local people have little control over their energy futures but can call for their recognised rights to be enforced. One specific justice issue here is that the recognised rights are not sufficient, as only *ayant-droits* are officially recognised. Another issue is that the way in which local people are to be included in relevant procedures is not clear, and may not stretch beyond consultation (Arnstein 1969). In such cases of grid-based electricity provision to a powerless people, the search for both justice concerns and their resolution must begin with the powerful actors providing energy. It is at the interface of energy producers and the affected community that systems must be set up to allow for both recognition and procedural justice.

Table 5.2 Rights and responsibilities for energy justice in grid-based and off-grid energy systems

	Rights		Responsibilities	
	Who	What	Who	What
Grid-based	All affected people	Fair and meaningful involvement in project's processes	State/private energy company	Fulfilment of rights and delivery of energy
Off-grid	All household members	Fair distribution of tasks and benefits from energy	Individual/household head (depending on household structure)	Fulfilment of rights and creation of energy
	All households involved in energy project	Resources and skills for energy production	State/private energy company	Provision of resources and skills

This approach cannot simply be applied to the case of an off-grid energy system, however. The separation between producers, users and those affected, which forms the basis for the argument above, is not present here. Households are simultaneously producers, users and those affected, and it may be assumed that there are no justice concerns. However, households are not one unit, but rather are composed of individuals which may have different needs and concerns, and also different levels of power in decision-making about a household energy project (Browning and Chiappori 1998; Lundberg et al. 1997; Majlesi 2016). An application of the energy justice lens to an off-grid energy system must consider intra-household dynamics.

Beyond this, another relevant dynamics is that between households and the energy company providing them with resources and skills. This may be a public or private actor, but its role in enabling the fulfilment of basic rights means that it has important responsibilities. Off-grid contexts demonstrate that householders are constrained in their energy access by the question of whether or not the energy company is present. It is important to consider all actors involved in an off-grid energy project when applying the energy justice lens to determine who has the responsibility for fulfilling rights and enabling energy production. In this case, there may be a need to set up systems for recognition and procedural justice between energy producing households and the energy company.

The grid positioning of a particular energy system has clear implications for which justice concerns might be seen, and where they might be. While for grid-based systems it is the relationship between energy producers and those affected that must be carefully managed, in off-grid systems both dynamics within a household and with additional actors should be considered. Regardless of the system adopted, however, it is clear that the energy justice lens is relevant to the social sustainability of new renewable energy systems, and also to their environmental sustainability.

5.6   Conclusion: Energy Justice Research in the Global South

We argue, at this early stage of research in this area, for a loosening of theoretical logics of justice in energy justice studies. Theoretical accounts of justice threaten to bind energy justice researchers into pre-determined Western logics of justice (Barnett 2010; McCauley et al. 2019). Our macro and micro typology is an attempt to shake off the binds of such logic. For Caney (2010), justice research has previously focused on exposing and proposing archetypal normative frameworks. Attention should be drawn to where and when injustice is felt and experienced; in support of Hobson (2006), justice-based activism research must diversify its understanding of where injustice can be found in multiple contexts. Justice, in this regard, is pluralist.

Reed and George (2011: 839) comment, "researchers are cautioned that the long-observed disconnect between theory and practice in the field of environmental justice may be exacerbated should academics become more concerned with theoretical

refinement over progressive, practical, and possible change". The theorisation of justice seeks to expose ideal end points (and more recently processes) from various (usually Western) philosophical traditions. In a similar vein, Schlosberg (2013) argues that justice theorists need to be pluralist in accepting a range of understandings of "good". We argue from a geographical perspective that the comparative nature of spatial dimensions continues to offer an opportunity for expanding comparative philosophy. The first step in this direction is the acknowledgement that the study of justice is pluralist, and our understanding of spatial dimensions must develop accordingly. It is argued here that we need to explore the plurality of injustice too.

Martin et al. (2014: 2) acknowledge "that justice poses considerable conceptual challenges, not least because of the practical (if not intellectual) impossibility of reaching consensus". Their conclusion bears a self-reflective unease as they question the limitations of their own framing and methods, including the underlying logics of justice. This calls for acknowledgement then, that justice is contextual. Walker (2009: 622) comments, for example, that "as we move from concern to concern and from context to context, we can expect shifts in both the spatial relations that are seen to be significant and in the nature of justice claims being made".

We should examine multiple reasons for the construction of injustice. This chapter calls for an exploration of the construction of multiple energy injustices through activism-based research. The expansion in the theorisation of justice as a concept must be answered with a similar response in our empirical understanding of energy justice and the injustices it entails. As Barnett (2010: 252) comments in support of Sen (2011), "(r)ather than thinking of philosophy as a place to visit in order to find idealised models of justice or radically new ontologies, we would do well to notice that there is an identifiable shift among moral and political philosophers towards starting from more worldly, intuitive understandings of injustice, indignation, and harm, and building up from there".

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Chapter 6
Gender in Electricity Policymaking in India, Nepal and Kenya

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Abstract Electricity is regarded as a basic amenity fundamental to improving human well-being and overall economic development. It also contributes to improving gender parity and social inclusion, especially in situations where women are challenged by harsh living conditions. This chapter examines how gender issues that were considered are addressed in the policies related to electricity in India, Kenya, and Nepal. The analysis reveals that whilst more than half of the reviewed documents were devoid of any explicit mention of gender concerns, an increasing number of electricity policies are now reflecting gender considerations. The predominantly "gender-blind" approach towards the potential benefits of electricity access emanates from a reluctance to explicitly acknowledge gender based differences in needs in creating equitable outcomes. The assumption that electricity access itself is enough for associated benefits to trickle down, that too equitably for men and women, stems from limited awareness. This is aggravated further by the absence of documented evidence on the merit of including gender elements in electrification policies and programmes. Based on the review of existing electricity policies, this chapter provides specific recommendations for incorporating gender in the electricity policies with a view to support and address the broader energy justice concerns.

6.1 Introduction

Access to modern forms of energy, particularly electricity, is considered as crucial for overall human development. It is often deemed as an important pathway for improving gender equality and social inclusion, particularly in contexts where women are challenged by harsh living conditions and discriminatory norms. Existing literature from around the globe provides enough empirical evidences to

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validate the positive impact of access to adequate and reliable modern energy including electricity, on people's lives, and especially on women (GSI 2016; Winther 2008; Practical Action 2010). Whilst some of these evidences highlight the contribution of access to electricity in improving overall public services such as water supply, health, education and access to information and communication (Winther 2008; IUCN 2017), many other evidences suggest its role in improving the overall well-being of women through reduced drudgery, increased income and reduction in poverty (Dinkelman 2011; Grogan and Sadanand 2013; Standal and Winther 2016). This is further substantiated by studies that suggest that access to electricity also enhances women's economic opportunities (UNDP/ESMAP 2004; Sovacool et al. 2013; Matinga 2010). In addition, access to electricity enables children to have a more comfortable study environment at home and facilitate women gaining extra hours of productivity after sunset (Barkat et al. 2002; Laksono and Subagya 2003).

The disproportionate effects of the burden of energy deficiency on women have also been well documented (Clancy et al. 2004; ENERGIA/DfID 2006). Some of the lopsided effects of energy poverty on women and girls, representing unjust household energy dynamics, include the use of traditional biomass for cooking and lighting leading to adverse health issues, the drudgery associated with collecting firewood and fetching water, the burden of carrying out household chores without adequate light or using traditional lamps, discomfort in studying for students, and safety concerns related to mobility in the absence of community lighting (van de Walle et al. 2015; Rewald 2017).

Whilst there are numerous empirical studies on the welfare and economic impacts of electricity as well as the lopsided effects of energy poverty on women as delineated above, there is not enough evidence to understand how these issues are addressed by policymakers and how they are incorporated in the energy policies of many countries. Moreover, whilst there is a growing acceptance amongst policymakers of the importance of integrating gender impacts into the energy policies, in reality, the policies are often limited to gendered welfare schemes or contain vague gender references (ENERGIA/DfID 2006).

The aspirations regarding integrating gender into the energy policy domain has also assumed greater significance since the introduction of UN Sustainable Development Goals (SDG). As Goal 7 calls for ensuring 'access to affordable, reliable, sustainable and modern energy for all', including women and girls, such an integration will serve as both a precondition of and outcome to achieve the target of Goal 5 of SDG, which stresses on strengthening sound policies and enforceable legislation for the promotion of gender equality and empowerment at all levels.

Moreover, placing gender concerns in the policy regime is ever more regarded as crucial to address the broader social justice and energy ethics concerns. Analysis of 15 years of energy scholarship (Sovacool 2014a, b) has identified a critical need to integrate social science-related disciplines with energy studies. Hence, the popular energy justice framework proposed by Sovacool et al. (2016) calls for ensuring balance of all the competing aims in energy policy and implores the trade-offs made in the energy sector to be inherently more just and equitable in their societal outcomes rather than favouring different sections or factions within society. Though the

inclusion of gender in the energy justice and ethics realm is not explicit in the framework, it resonates with its core idea in terms of equitable sharing of outcomes. Likewise, Jenkins et al. (2017) have emphasised the need for dovetailing energy justice and policymaking to manage the translation of broad universally accepted values into real life down to the household and individual level.

In this context, this chapter aims to comprehensively examine how a few of the frontrunners amongst the developing countries recognise and prioritise gender elements and integrate them into their national electricity policies. This chapter also aims to document specific examples to illustrate the gendered outcomes of the electricity policies/programmes, mainly good practices as well as some evident gaps, with a view to informing the formulation of evidence-based and gender-responsive electricity policies.

6.2 The Gender Dimensions of Electricity Policies

Gender-related provisions in energy policies, particularly in electricity services, have often been formulated at international levels through long drawn out consultative processes led mostly by the UN agencies. One of the earliest instances was the United Nations Fourth World Conference on Women in Beijing in 1995, where Objective G of the Platform for Action called for gender mainstreaming in all policies and programmes (UN Women 1995). The Beijing Declaration clearly identified the need for inclusion of women's priorities in public investment for economic infrastructure including electrification and energy conservation (UN Women 2014). Likewise, the Ninth Session of the UN Commission on Sustainable Development (CSD-9) in 2001 specifically recommended governments to "support equal access for women to sustainable and affordable energy technologies through needs assessments, energy planning and policy formulation at the local and national level" (ECOSOC 2001). The more recent SDGs (goals 5 and 7) and related initiatives like the Sustainable Energy for All (SE4ALL) also clearly recognise the need for addressing gender inequalities and advancing women's empowerment towards achieving the goal of universal access to modern energy.

Despite the international commitments towards gender-responsive energy policies, the 2017 report by the International Union for Conservation of Nature (IUCN) reported that only a third of the 192 national energy frameworks reviewed included any references to women and/or gender (IUCN 2017). Another IUCN (2018) review noted that nearly three-fourths of the 45 documents from 29 Sub-Saharan African countries reviewed considered gender to some extent within their principles, objectives, strategies or activities (IUCN 2018). A review by UN Women and UNDP-UNEP PEI (2017) shows a positive trend, where energy policies acknowledged the need for enhancing women's participation in policymaking and decision-making in the sector. In academia, a limited literature reviews gender inclusion in electricity policies especially in India, Nepal and Kenya. Notable exceptions include the gender audits of energy policies and programmes, assisted and/or conducted by

ENERGIA, in countries such as Botswana, Kenya, Senegal, Philippines, India, Nigeria and Ghana (ENERGIA 2011).[1] Yet more work is required.

As noted by Oparaocha and Dutta (2011), very few energy policies included gender mainstreaming in their frameworks. Indeed, gender disparities have rarely been addressed as an integral part of the national energy policies and programme design (Cecelski 2005; Köhlin et al. 2011)—arguably as a result of the non-availability of gender-disaggregated data to inform energy policies (Clancy et al. 2011). Where they are included, these gender discourses, especially in the Global South, have and continue to be focussed primarily on cooking energy sector, which represents only a small fraction of potentially relevant concerns (Cecelski 1995; IRADE 2009; Practical Action 2014).

Though there has been some progress in mainstreaming gender in electricity policies of many countries, the attempts are not well structured, and often not applied at the national scale. The absence of a systematic gender integration in electricity policies at large appears as a paradox in the light of the expressed commitments to support gender equality by the various national and international programmes, including the SDGs. It is in this context that the large investments into electrification projects raise ethical questions on the distribution of benefits or burden of skewed interventions on gender at large. Moreover gender inclusion in the policy regime is also in sync with the emerging theme of energy ethics and justice which recognises participation, representation and distribution of energy transformation's benefits and constraints (Miller 2014; Sovacool et al. 2016).

6.3   Objectives

This chapter explores some aspects of the following research questions:

- To what extent do gender elements form a part of the electricity policies of India, Nepal and Kenya?

    – The review traces the trajectory of the gender discourse in the electricity sector policies/programmes and their relevance as a tool to promote equality and empowerment.

- To what extent and how are these policies implemented in practice?

    – The review will document some examples that reflect the extent to which the national policies/programmes of India, Nepal and Kenya may have translated or have missed opportunities for achieving gender outcomes.

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[1] A few other studies that have tried to analyse gender in energy policies include Sengendo (2011), IUCN (2017, 2018) and UN Women and UNDP-UNEP PEI (2017).

6.3.1 Approach and Methods

The research consisted of a comprehensive desk review and critical assessment of national and sub-national electricity policies of three countries—India, Nepal and Kenya. The documents reviewed included electricity acts/policies/plans/programmes of the respective countries. Only publicly available documents in English were considered for review. A total of 47 policies/plans/programmes—14 from India, 23 from Nepal and 10 from Kenya—were assessed in the study.

To ascertain the inclusion of gender in electricity policies, the documents were assessed using the following criteria:

(a) Offer scope to enhance women's participation and access to electricity
(b) Address women and girls' needs as end users
(c) Ensure women's involvement in supply
(d) The extent to which women take part in policy formulation and execution

In order to gauge this, the authors undertook a two-stage analysis. In the first stage, the team collected a range of electricity policies/plans/acts/programmes in each country primarily implemented/enacted within the last five decades. Gender-related key words (e.g. "gender", "girl", "women", "female", "gender mainstreaming", "engendering", "gender budgeting", "gender equality", "gender inclusion" and "mother", "daughter", "sister", "wife") were searched for in these policy documents based on IUCN's Global Gender Office's gender keyword dictionary, and gender mainstreaming documents of ADB, ESMAP, World Bank and ENERGIA, amongst others. Wherever explicit mention of gender/women could not be located, other related key words were considered such as "stakeholder", "beneficiary", "customers", "consumer", "end-user", "vulnerable", "labourer", "marginalised", "member", "decision maker", "participant", "household energy", "female-headed household", "villager", "agents of change", "franchisee", "Self-Help Group" and "empowerment". These words were blanket terms which were gender neutral, and thus were understood to implicitly include women also and thus allowed for the analysis of even those electricity-related policies/plans for any gender connotations, which did not directly mention gender.

The next stage consisted of analysing the context of such key words in the policy documents. Finally, one example was documented from every country based on secondary literature to illustrate the outcomes of the gendered policies/legislations, including good practices as well as some evident gaps.

6.3.2 Limitations

This review does not undertake an in-depth assessment of the conceptualisation, implementation and the outcomes of the policies, though efforts were made to capture some good practices and missed opportunities, thus is limited in scope. The

structure, content, nature, scope and mandate of the electricity policies in each country also differed since the policies were aligned with their respective overall national objectives. Furthermore, various electricity policies were conceptualised and implemented in different years in our study countries, hence attributing linear patterns in their evolution or implementation was not possible.

This chapter does not claim to offer strict comparison of gender inclusion based on the trajectory of policies across the three countries, rather it deals with the analysis of the nature of gender inclusion based on the identified key words. It is also important to note that mere gender inclusion in policy frameworks does not precisely reflect ground-level implementation and realisation of the intended benefits, and hence will not give a complete understanding of gender equality and empowerment in the energy domain. Considering these limitations, this review is a modest effort to provide insights to understanding the commitments made by the national governments to promote gender equality and women's empowerment in the energy sector.

6.4   Findings

6.4.1   Gender Inclusion in the Electricity Sector Policy in India

Table 6.1 captures the key features of electricity policies in India and the indication of gender-related key words in them.

Planned electrification in independent India began in the 1950s and has since seen consistent progress in terms of infrastructure development and large-scale power sector reforms. The earliest electrification programmes were formulated to provide the population with basic minimum facilities and laid the foundation of public infrastructure, which has since been progressively strengthened. Though universal electrification has been the commitment of successive governments, special provisions were made to make basic electricity services available to the poor, marginalised and disadvantaged. However, attention to gender has historically failed to take centre stage in electricity policies in India, making an appearance only comparatively recently (see Table 6.1). It was observed that policies mostly used gender-neutral terms such as "consumer" or "customer" to address beneficiaries of both genders in an equal manner. Amongst the policies reviewed those few that do address women or girls explicitly have been summarised in the following section.

Characterisation of Women in Policies

Table 6.2 captures how the policy/plan characterises women in India's electricity policies.

Table 6.1 Electricity policies in India—key features and gendered terminology

Name of the policy/plan/programme	Key features	Mention of gender or related terminology
Electricity Supply Act (1948)	• Mandated constitution of central electricity authority and state electricity boards	*'Consumers', 'member', 'persons', 'workmen'*
The Minimum Needs Programme (Fifth Five Year Plan: 1974–1979)	• Provides for rural electrification in remote/far-flung villages	None
Kutir Jyoti Programme (1988–1989)	• Improve quality of life of the poorest by extending a single-point connection to below poverty line (BPL) households • 100% grant for one-time cost of internal wiring and connection charges	*'Beneficiaries'*
Electricity Supply Act 1991 Amendment	• Document Not Available (DNA)[a]	Not applicable (NA)
Electricity Regulatory Commission Act (1998)[b]	• Initiated setting up of regulatory bodies at central and state levels for tariff fixation	*'Consumers'*
Pradhan Mantri Gramodaya Yojana[c] (2000–2001)	• DNA	NA
Accelerated Rural Electrification Programme (2002–2003)	• DNA	NA
Electricity Act (2003)[d]	• Provisions for use of decentralised stand-alone systems to electrify rural areas • Introduced reforms—unbundling of state electricity boards, de-licensing generation, open-access electricity market and power trading	*'Consumers'*
Accelerated electrification of 100,000 villages and ten million households (2004)	• DNA	NA
Rural Electricity Supply Technology Mission (2004)	• DNA	NA
National Electricity Policy (2005)[e]	• Ensure electricity access to all households at reasonable rates • Achieve minimum energy consumption of 1 kWh per household per day	*'Community', 'customers', 'consumers'*
Rajiv Gandhi Grameen Vidyutikaran Yojana[f] (RGGVY) (2005)[g]	• Mandated free connections for BPL families • Promoted decentralised distributed generation projects where grid extension is not feasible • Central government covered 90% of capital cost and the rest by the states	*'Consumers', 'self-help groups', 'franchisee'*

(continued)

Table 6.1 (continued)

Name of the policy/plan/ programme	Key features	Mention of gender or related terminology
Rural Electrification Policy (2006)[h]	• Provision of quality and reliable electricity supply to all households at reasonable rates	*'Women', 'consumers', 'community', 'stakeholders'*
Integrated Energy Policy (2006)[i]	• Reliably meet demand for energy services of all sectors at competitive prices	*'Women', 'consumers', 'community', 'disadvantaged'*
Remote Village Electrification Programme (2003–2004)	• DNA	NA
Village Energy Security Programme	• DNA	NA
Jawaharlal Nehru National Solar Mission[j]	• Achieve grid parity for solar photovoltaic and thermal power by year 2022	*'Consumers', 'customers'*
Deen Dayal Upadhyaya Gram Jyoti Yojana (2014)[k]	• RGGVY subsumed into this scheme • Strengthening sub-transmission and distribution network • Separation of domestic and agriculture feeders	*'Consumers', 'customers'*
Ujwal Discom Assurance Yojana (2015)[l]	• Revamping financial health of ailing discoms[m] • State governments to take over 75% of debt of discoms	None
24/7 Power for All[n]	• Joint initiative of central government and states/union territories	Not in the overall scheme. Separate documents for each state were not analysed
Prime Minister Sahaj Bijli Har GharYojana (SAUBHAGYA) (2017)[o]	• Provide "last mile" connectivity to all unelectrified households by March 2019 • Where grid extension is not feasible, households to be provided with solar PV stand-alone systems or power packs	*'Consumers', 'beneficiary', 'stakeholders', 'villagers', 'female-headed households'*

[a]Policies/programmes where document is not available have not been reviewed
[b]http://www.cercind.gov.in/ElectReguCommiAct1998.pdf
[c]Roughly translated into "Prime Minister's Rural Scheme"
[d]http://www.cercind.gov.in/Act-with-amendment.pdf
[e]http://www.derc.gov.in/ActsPolicies/ActsPolicesfiles/National%20Electricity%20Policy.pdf
[f]Translated into "Rajiv Gandhi Rural Electrification Scheme"
[g]http://indianpowersector.com/home/electricity-regulation/government-programmes/
[h]http://www.ielrc.org/content/e0639.pdf
[i]http://planningcommission.gov.in/reports/genrep/rep_intengy.pdf
[j]https://mnre.gov.in/file-manager/UserFiles/draft-jnnsmpd-2.pdf
[k]https://powermin.nic.in/sites/default/files/uploads/Deendayal_Upadhyaya_Gram_Jyoti_Yojana.pdf. The Hindi name of the scheme roughly translates to "Deen Dayal Upadhyaya Rural lighting scheme"
[l]https://www.uday.gov.in/about.php
[m]Short for Distribution Company
[n]http://www.recindia.nic.in/power-for-all
[o]https://powermin.nic.in/sites/default/files/webform/notices/OM_SAUBHAGYA_SIGNED_COPY.pdf. The name translates to "Prime Minister's Scheme for Electricity for All homes"

Table 6.2 Reflection of gender terms in India's electricity policies (2005–2017)

Name of the policy/plan/programme	Gender context in electricity policy
Rajiv Gandhi Grameen Vidyutikaran Yojana (2005)	• Provisions for community participation through SHGs (including those for women) to take up project franchises
Rural Electrification Policy (2006)	• Acknowledges that the burden of non-availability of energy falls more on women • Encourages women's participation in the implementation of rural electrification programmes • Section 6.2 of the policy mandates women's representation in District Committees
Integrated Energy Policy (2006)	• Identifies disproportionate impacts and drudgery of using traditional energy sources on women and girls • Recognises the lack of attention paid to gender issues in energy policies • Suggests greater participation by women's groups in taking up franchises of Rajiv Gandhi Grameen Vidyutikaran Yojana
Prime Minister Sahaj Bijli Har Ghar Yojana (SAUBHAGYA) (2017)	• Identifies multiple categories of households that are eligible for scheme, including female-headed households

Out of the 14 Indian policies analysed, only 4 have included gender-specific terms and indicators. Amongst these, the Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY), a rural electrification programme implemented during 2005–2014, stands out for providing a good example of using policies as a vehicle for incorporating gender measures. The RGGVY offered women the scope to take franchises, through women's SHGs, for metering, billing, connection practices and running local networks.

Another notable policy is the Rural Electrification Policy of 2006, which recognised the importance of women's participation to ensure "effective, efficient and sustainable implementation of rural electrification programs", required women's representation in the District Committees formed under section 166(5) of the Electricity Act. Clear gender references and provisions can also be found in the Integrated Energy Policy of 2006, which acknowledges the disproportionate impacts and drudgery of using traditional energy sources on women and girls. The policy design also recognises "Household Energy Security" and offers measures such as electricity, clean cooking options and fuel wood plantations to meet the energy needs. Whilst provisions for women's involvement and participation can be found in the policy, it mostly dealt with biomass and cooking energy, further deepening the gender stereotyping. In terms of electricity, this policy refers back to RGGVY and makes the same suggestion as the former. The latest programme for household electrification—SAUBHAGYA—identifies female-headed households as eligible beneficiaries for free electricity connection, but no further references to the role of women in the scheme are found.

India, though, has effectively committed to achieving the SDG goals (5 and 7) and several important initiatives have been taken in the last 2 years for promoting

gender equality and also for achieving universal energy access, integrating gender equality and women's empowerment into essential energy policies and action, desire more commitment.

6.4.2   Gender Inclusion in the Electricity Sector Policy in Nepal

Table 6.3 captures the key features of Acts, Policies, Programmes and Periodic plans in Nepal and the indication of gender-related key words in them.

The thrust of the various electrification policies of Nepal over the years has primarily been to ensure access to all parts of the country, as well as to enable capacity addition. The initial schemes focus solely on the development of hydro power, along with thermal power stations to meet the power demands and economic activities of the population. The emphasis was also on electrifying remote mountainous rural areas through micro and mini hydro projects. In later years, the government began to promote renewable and clean technologies through the Alternative Energy Promotion Centre (AEPC), as way to fulfil energy access obligations in an environmentally sustainable manner.

The analysis shows that the initial electrification schemes were gender blind[2] as successive governments prioritised providing electricity access to all parts of the country, and all sections of society without discrimination. This is evident from the policy summary where a diverse range of terms such as "consumer", "customer", "user-groups", and "manpower" have been used to generally describe beneficiaries. However, it is also notable that the policies of the past two decades exhibit more gender awareness, both in terms of recognising the disproportionate impacts of non-availability of electricity on women, and in terms of making appropriate provisions to ensure inclusion.

Characterisation of Women in Nepalese Energy Policies

Table 6.4 captures how the policy/plan/programme characterises women in Nepal's electricity policies.

In Nepal, 6 of the 23 plans and policies analysed include some references to gender and can be comparatively considered as "gender-responsive" and "gender integrating", given they included "gender mainstreaming" or "women's involvement, participation and representation" as guiding principles. For instance, the Tenth FYP (2002–2007), the National Rural and Renewable Energy Programme (2012), and the National Energy Strategy (2013) acknowledge the role of women in energy planning and decision-making processes, both as professionals and grass-

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[2]The failure in policies and interventions to recognise that women's and men's positions and needs are often different.

Table 6.3 Acts, policies, programmes and periodic plans in Nepal—key features and gendered terminology

Name of the periodic plan	Key features	Mention of gender or related terminology
The First Five-Year Plan (FYP) (1956–1961)[a]	• First planned approach to electrification • Hydro and diesel power generation projects started	*'Community'*
Second FYP (1962–1965)	• DNA	NA
Third FYP (1965–1970)[b]	• Increase generation, construct new transmission networks	None
Fourth FYP (1970–1975)[c]	• Utilising water resources for power generation and supply	None
Fifth FYP (1975–1980)[d]	• Maximising power output to meet basic needs of people	*'Manpower', 'labour' 'community', 'consumers'*
Sixth FYP (1980–1985)[e]	• Increase power production • Promote domestic use of electricity to reduce burdens on forests • Electrify transport industry	*'Local labour'*
Seventh FYP (1985–1990)[f]	• Increasing power production • Construction of small hydro plants in mountainous areas	*Training programmes for people involved in alternate energy is mandated*
Eighth FYP (1992–1997)[g]	• Rural electrification and development of electrified transport • Hydropower development policy enacted	*'Local labour', 'manpower', 'local people'*
Ninth FYP (1997–2002)[h]	• Expanding electricity network in economically sustainable manner	*'People's participation', 'indigenous talent', 'consumers', 'user-groups'*
Tenth FYP (2002–2007)[i]	• Same objectives as the previous plan • Focuses on utilising local labour in hydro projects and establishing an institution to produce and train manpower	*'Nepali labour', 'women', 'manpower', 'people', 'consumers', 'community user groups', 'local labour'*
Eleventh Plan (2007–2010) (Three-year interim plan)[j]	• Promoted domestic and foreign investments in hydro power • Emphasis on local participation, training and capacity building of manpower engaged in electricity projects	*'Women', 'people', 'Community', 'labour', 'consumers', 'manpower', 'human resources', 'individuals', 'dalits', 'adibasi janjatis', 'marginal communities'*
Thirteenth Plan (2013–2016)[k]	• Development of renewable energy in areas where grid is unlikely to reach	*'People', 'local users', 'citizens', 'community'*
Nepal Electricity Authority Act (1984)[l]	• Establishment of Nepal Electricity Authority	*'Consumers'*

(continued)

Table 6.3 (continued)

Name of the periodic plan	Key features	Mention of gender or related terminology
Electricity Act (1992)[m]	• Legalised private sector participation in power sector • Authorised setting up of a Tariff Fixation Commission	*'Consumers'*
Nepal Electricity Authority Act (1984)[n]	• Establishment of Nepal Electricity Authority	*'Consumers'*
Hydro Power Development Policy (1992)[o]	• Supply electricity to meet domestic and industrial demands • Motivate national and foreign private sector investment in hydro power	None
Electricity Act (1992)[p]	• Legalised private sector participation in power sector • Authorised setting up of a Tariff Fixation Commission	*'Consumers'*
Subsidy Policy for Renewable Energy (2000)[q]	• Use of RETs in rural areas and to attract private sector to RET's market • Provide low-income households opportunity to access services	*'User', 'end-users' and 'consumer'*
Hydro Power Development Policy (2001)[r]	• The 1992 policy was revised to imbibe technological advancements, new market trends, and to enhance foreign investment • Small and mini hydro projects encouraged for remote areas	*'Consumers'*
Rural Energy Policy (2006)[s]	• Rural poverty reduction and environmental conservation through clean, reliable energy • Private sector investments emphasised	*'Women', 'users', 'marginalised', 'disadvantaged', 'low caste', 'backward groups'*
Community Electricity Distribution By-Laws (2003)[t] or Community Rural Electrification Programme	• Promote public participation in electricity distribution • Augment technical and managerial capability of rural community • 80% of project cost covered by government, 20% arranged by community • To avail subsidy the community has to form a Community Rural Electrification Entity (CREE)	*'Community', 'customer', 'consumer'* *Though not stated in by-laws, gender and social inclusion is mandated in user groups*

Table 6.3   (continued)

Name of the periodic plan	Key features	Mention of gender or related terminology
National Rural and Renewable Energy Programme (NRREP) (2012)[u]	• Improve living standard, employment and productivity of rural women and men • Reduce dependency on traditional energy • Emphasis on involving beneficiaries in decision-making and productive use of energy	*The Gender and Social Inclusion (GESI) guidelines mainstreamed into development objective, outputs, activities and project monitoring*
National Energy Strategy (2013)[v]	• Devised to meet energy demands of people through efficient use of indigenous energy resources • Covers a number of energy issues and different energy technologies	*'Women', 'weak socio-economic groups' such as dalits*
Renewable Energy Subsidy Policy (2016)[w]	• Revision of the 2000 subsidy policy (increase access to renewable energy, improve livelihoods and create employment in rural areas)	*'Women'; women-led households are classified as 'targeted beneficiary groups'*

[a]https://www.npc.gov.np/images/category/FirrstPlan_Eng.pdf
[b]https://www.npc.gov.np/images/category/Thirs_ENG.pdf
[c]https://www.npc.gov.np/images/category/fourth_eng.pdf
[d]https://www.npc.gov.np/images/category/fifth_eng.pdf
[e]https://www.npc.gov.np/images/category/sixth_eng.pdf
[f]https://www.npc.gov.np/images/category/seventh_eng.pdf
[g]https://www.npc.gov.np/images/category/eighth_eng.pdf
[h]https://www.npc.gov.np/images/category/ninth_eng_2.pdf
[i]https://www.npc.gov.np/images/category/10th_eng.pdf
[j]https://www.npc.gov.np/images/category/11tyip_eng.pdf
[k]https://www.npc.gov.np/images/category/13_plan_Approach_paper_english.pdf
[l]http://www.lawcommission.gov.np/en/documents/2015/08/nepal-electricity-authority-act-2041-1984.pdf
[m]http://www.doed.gov.np/policy/Electricity_Act_2049-english.pdf
[n]http://www.lawcommission.gov.np/en/documents/2015/08/nepal-electricity-authority-act-2041-1984.pdf
[o]http://www.nea.org.np/admin/assets/uploads/supportive_docs/4561Hydropower%20Development%20Policy.pdf
[p]http://www.doed.gov.np/policy/Electricity_Act_2049-english.pdf
[q]https://www.aepc.gov.np/uploads/docs/2018-06-19_RE%20Subsidy%20Policy,%202073%20(English).pdf
[r]http://www.lawcommission.gov.np/en/documents/2015/08/hydropower-development-policy-2058-2001.pdf
[s]http://www.mope.gov.np/download/RE-Policy-2006.pdf.1dc9d388e707e63d760639ed49a98af1
[t]http://www.nea.org.np/admin/assets/uploads/supportive_docs/Community%20Electricity%20Distribution%20Bylaw.pdf
[u]https://policy.asiapacificenergy.org/sites/default/files/NRREP%20Programme%20Document-June%202012.pdf
[v]http://www.wecs.gov.np/uploaded/National-Energy-Strategy-of-Nepal-2013.pdf
[w]https://www.aepc.gov.np/uploads/docs/2018-06-19_RE%20Subsidy%20Policy,%202073%20(English).pdf

Table 6.4 Reflection of gender terms in Nepal's electricity policies

Name of the policy/plan/programme	Gender context in electricity policy
Tenth FYP (2002–2007)	• Envisages involving women in every level and sector of policy implementation • Involve women in production, distribution and consumption of electricity
Eleventh Plan (2007–2010) (three-year interim plan)	• Encourages women's participation in the Rural Electrification Programme
Rural Energy Policy (2006)	• Recommends the design and implementation of special programmes for rural energy access with benefits to women and children • Mandates formation of user groups for power projects with representation of women • Integrating women's development programmes with rural energy programmes
National Rural and Renewable Energy Programme (2012)	• Mainstreamed Gender Equality and Social Inclusion (GESI) guidelines at all levels. GESI mainstreaming entails specific affirmative action for empowerment of women by augmenting their technical capabilities and fostering a sense of ownership of technology
National Energy Strategy (2013)	• Acknowledges the lack of women's representation in energy planning and decision-making • Strategises involving women proactively, to enhance their capacity and instil a sense of responsibility
Renewable Energy Subsidy Policy (2016)	• Encourages use of RETs to reduce drudgery of rural women • Women-led households categorised as one of 'targeted beneficiary groups'

roots workers. Indeed, the emphasis is on the active role of women in the production, distribution and consumption of electricity. The GESI guidelines also ensure women and men are given equal access and benefits from renewable energy technology deployment.

The Rural Energy Policy (2006) noted the possible positive impact of special programmes to increase access to modern energy in rural areas on women and children. The policy also envisaged formulating programmes for women's development with women as an integral part. The Subsidy Policy for Renewable Energy (2013) emphasised on accelerating renewable energy service delivery and enhancing productive use of energy in order to benefit men and women for more equitable economic growth, and to create rural employment, particularly for women. The policy also provided for an additional subsidy benefit of NPR 2500–4000 (USD 23.63–37.81)[3] per household for single women headed households and other disadvantaged groups.

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[3] One USD = 113.48 NPR (As on 20 February 2019).

The authors are of the opinion that by incorporating a commitment to gender inclusion in electricity policies and thus recognising and prioritising gender in the last two decades, Nepal has shown clear pathways on gender mainstreaming in macroeconomic and sectorial policies to achieve SDG targets.

6.4.3   Gender Inclusion in the Electricity Sector Policy in Kenya

Table 6.5 captures the key features of electricity policies in Kenya and the indication of gender-related key words in them.

As in the case with India and Nepal, initial Kenyan policies and schemes on electricity focussed primarily on establishing the infrastructure and hence laid down guidelines for regulation of the generation, transmission, and distribution segments of the power sector. With time, policies shifted their focus more towards ensuring equitable access to all the sections of society in a sustainable manner, thus, leading to schemes for promoting renewable energy technologies and rural electrification were initiated. More recent policies clearly show an all-encompassing and holistic approach towards the energy sector and thus, gender and related issues gained prominence. Though all ten of the reviewed policies adopt a largely gender-neutral approach and address beneficiaries as "consumer", "customer", "youth" and "vulnerable", amongst others, some policies do have exclusive targets for gender, especially women, which have been captured in Table 6.6.

Characterisation of Women in Policies

Table 6.6 captures how the policy/plan/programme in which there are elements of gender inclusion characterises women.

Four of the ten energy policies of Kenya analysed for this chapter contain explicit gender references and provisions. The very first gendered policy for electricity is Sessional Paper No. 4 of 2004. Although the exclusive gender sub-section of the policy is centred on women's access to biomass and clean cooking, there are other sections in the policy that reference the need to address the gender imbalances in energy policy formulation by involving women in the process. In all three of Kenya's draft National Energy and Petroleum policies (2012, 2014, and 2015), gender mainstreaming in energy planning and development has been recognised as one of the key challenges. These policies lay out the framework for meeting the needs of women, youth and persons with special needs. The draft energy policies also necessitate the government of the day to comply with Article 27(8) of the Constitution, which requires equality and freedom from discrimination, and implementation of the one-third minimum gender principle in the membership of all elective or appoyntive bodies. The policies, however, remain in a draft form. Nevertheless,

Table 6.5 Electricity policies in Kenya—key features and gendered terminology

Name of the policy/plan/programme	Key features	Mention of gender or related terminology
Electric Power Act Number 11 of (1997)	• To facilitate and regulate generation, transmission, distribution, and use of electric energy	*'Customers'*
Sessional Paper No. 4 (2004)	• Electricity sub-section: • Authorised privatisation of generating utility and unbundling of the state transmission and distribution company • Promotion of private and community-owned renewable energy and hybrid power plants • Encouraged competition in electricity retail market	*'Gender', 'Women', 'Girl', 'Consumers', 'Customers', 'Vulnerable', Beneficiaries', 'Persons', 'People'*
Energy Act (2006)	• Mandated establishment of Electricity Regulatory Commission, Rural Electrification Authority, and the Energy Tribunal • Reforms in the form of inclusion of energy policy and integrated energy plan	*'Customers'*
Rural Electrification Master Plan	• DNA	NA
Kenya Vision (2030) (2007)	• Increase energy supply through large scale power infrastructure development	*'Youth', 'Women', 'Men', 'Vulnerable' used in document but not in electricity context*
Feed in Tariff Policy, 2010	• Provides investment security to renewable power generators • Encourages private investment through independent power producers	*'Consumers'*
Draft National Energy Policy (2012) (Sessional Paper—Third Draft)	• Electricity sub-section: Elaborates on challenges faced by sector, and defines short, medium and long-term strategies for electricity sources, including renewable energy	*'Gender', 'Consumers', 'Customers'* *There is a section on gender in the policy document (9.7.1.5)* *Section 9.4 of the policy document addresses gender challenges and strategies to mitigate them*
The National Energy Policy and Energy Bill (2013)	• Mandated establishment of energy sector entities • Promoted renewable energy	*'Consumers'*
Draft National Energy Policy (2014)	• Electricity sub-section: Follows up on draft national energy policy of 2012 • Presents roadmap for developing the sector further	*'Gender', 'Women', 'Youth', 'Consumer', 'Customer', 'Marginalised', 'Minorities'*
National Energy and Petroleum Policy (2015)	• Broadly same as the previous version—National Energy Policy (2014)	*'Gender', 'Women', 'Consumers', 'Customer', 'Marginalised'*

Table 6.6 Reflection of gender terms in Kenya's electricity policies (2004–2015)

Name of the policy/plan/programme	Gender context in electricity policy
Sessional Paper No. 4 (2004)	• Gender sub-section 5.4 highlights drudgery faced by women due to lack of access to modern energy. The document primarily refers to biomass energy, not electricity • Section 5.9 endorses redressing gender imbalances in energy sector management • Section 6.6.10 emphasises the need to integrate women in energy policy formulation
Draft National Energy Policy (2012) (Sessional Paper—Third Draft)	• Acknowledges lack of gender mainstreaming in energy • Mandates implementation of 'one-third gender principle' in energy sector institutions • Incorporated gender audit of public sector institutions and gender representation in energy sector planning and implementation committees
Draft National Energy Policy (2014)	• Mandates mainstreaming gender into policy formulation, planning, production and use, along with implementing one-third gender reservation provision
National Energy and Petroleum Policy (2015)	• Section 9.4.2 mandates spreading awareness and education on modern energy services; and making them accessible and affordable

Kenya has committed to strengthening the inter-linkages between SDG 7 and SDG 5 and has called for integration of gender equality and women's empowerment into all energy actions to advance the SDGs. Further, importance is also given to develop gender-responsive policies, programmes and monitoring systems, and ensure equal participation of women in decision-making bodies in energy institutions, along with sex disaggregation and gender analysis of data to monitor SDG 7 (UNSDG 2018).

6.5 Country-Wise Policy Comparisons

A summary of key gender-specific provisions of the major gender-aware policies of the three study countries is provided in Table 6.7.

It is evident that quantitatively Nepal's gender inclusive electricity policies outnumber both India and Kenya. Nepal was also an early mover in terms of the first gender-friendly policy. Whilst the policies of the three countries advocate women's participation in energy projects overall, the provisions related to gender vary in each case.

In India, targeted provisions for women are present only in the Rural Electrification Policy and the RGGVY, in the form of women's representation in District Committees and women SHGs for franchise development. Since RGGVY was subsumed into Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY), this scheme also has all these provisions. The energy policies of Kenya are seen to be more specific in terms of gender inclusion in policy. They not only acknowledge the gaps

Table 6.7 Country-wise comparison of gender in policies

Country	India	Nepal	Kenya
Key points of the gender-aware policies	RGGVY (2004) Promotes women women SHGs to take up franchises	Tenth FYP (2002–2007) Involving women in every aspect of electricity supply and policy implementation—production, distribution and consumption	Sessional Paper No. 4 (2004) Involving women in energy policy formulation, and redressing gender imbalances in the sector
	Rural Electrification Policy (2006) Mandates women's representation and participation in District Committees and rural energy projects	Eleventh Plan (2007–2010) Encourage women's participation in rural electrification	Draft National Energy Policy (2012) Mandates one-third women's representation in energy sector institutions, gender auditing of public institutions and representation in energy planning and implementation committees
	Integrated Energy Policy (2006) Encourages uptake of franchises by women SHG's through RGGVY	Rural Energy Policy (2006) User groups with women's representation for power projects and women's development projects to be integrated with rural energy projects	Draft National Energy Policy (2014) Reiterates one-third gender reservation rule and calls for gender mainstreaming in all aspects of energy—from policy to use
	SAUBHAGYA (2017) Female-headed households are beneficiaries of electricity connections under the scheme	National Rural and Renewable Energy Programme (NRREP) (2012) Designed with GESI guidelines integrated at every stage which aimed to ensure equal access and benefits to women and men. Technical capabilities of women to be augmented	National Energy and Petroleum Policy (2015) Has same gender target as policy of 2014 Spreading awareness and increasing accessibility and affordability of modern energy
		National Energy Strategy (2013) Capacity enhancement of women by involving them in energy planning and decision-making	
		Renewable Energy Subsidy Policy (2016) Women-led households considered as targeted beneficiaries	

in energy policy, but also seek to bridge these gaps through actions like gender auditing; reserving seats for women in legislative bodies, jobs and boards of companies; and making it compulsory for women to participate in energy planning and implementation process. Educating the populace of Kenya on modern energy is a unique measure proposed by the National Energy and Petroleum Policy, 2015 as a part of their gender goals.

For Nepal—the most gender advanced of all the cases—policies not only acknowledge the disproportionate impacts of the lack of modern energy on women, but also propose to involve women in the different stages of policy formulation, electricity project implementation and electricity usage, along with having women's representation in electricity user groups. The NRREP (2012) has been specially designed encompassing GESI guidelines in every aspect as a means to ensure equal benefit to both genders as well as making way for women's empowerment. In all, it can be inferred that the studied policies of Nepal have a clearer and broader vision for gender inclusion, which if implemented well as per their commitment to achieving the goals of SGD 5 and 7, can bring about lasting changes in the way policies and programmes of the future are formulated.

Elements of gender inclusion in some of the electricity policies in the three countries can be considered as a first step in addressing gender dimension of energy ethics. The broader principles of energy ethics and justice which advocate concepts of distribution, recognition and processes (Jenkins et al. 2017) can be aptly applied to the gender and energy nexus. However the greater challenge is converting the gender-inclusive electricity policies into practices and the subsequent realisation of the gendered benefits.

6.6 Putting Policy into Practice

When the policies which offer scope for gender inclusion are put into practice, women can become powerful agents for energy justice through their involvement in the value chain, which itself is a critical pathway for serving the objectives of SDG (goals 5 and 7) and SE4ALL. The frame of this research looked for few examples in the study countries that represent successful transition of legislation/policy to practice as well as missed opportunities in disbursing the intended benefits to women.

On the positive side, the state electricity distribution companies in Maharashtra, Odisha and West Bengal of India involved women in last mile electricity distribution as part of the policy. The policy offered scope for women to take franchises, through women's SHGs, for metering, billing and running local networks. In Odisha, such franchises reportedly resulted in significant improvements in terms of reduced distribution losses, reduced aggregate technical and commercial losses, increased billing percentages, increased consumer coverage and increased total annual collection (Government of Odisha 2012). There are also other interesting anecdotal evidences to suggest the positive impacts of such policy interventions towards achieving gender outcomes (Box 6.1).

Box 6.1 Vidyut Sahayak of Maharashtra
Maharashtra State Electricity Distribution Company Ltd. (Mahavitaran) appoints women line staff known as *Mahila Vidyut Sahayak* (Women Electricity Support Staff) under a policy that reserves 30% of the electricity line staff jobs for women as a part of the Mahavitaran agenda for women empowerment.

Through this scheme, the electricity company has taken women as line staff to work hands-on with electricity poles, transformers, live cables and other pieces of field equipment used in a power supply network. An all-women squad, popularly known as Damini Phatak, was also implemented to address the consumer complaints regarding photo meter reading and to check meter tampering. Since the work required travelling to distant places and snapping off power supply in the event of default, the company has instituted a special redressal cell to look into work-related problems faced by women. This case was also highlighted in recent study by TERI (Dholakia 2019).

Source: http://mahadiscom.co.in/aboutus/Company_Profile_Jan15.pdf

Understanding the differentiated needs of men and women, the Rural Energy Development Programme of Nepal (initiated in 1996) established male and female community organisations with equal responsibilities and facilitated their capacity building to enhance livelihood opportunities from micro hydro systems (Rana-Deuba 2001).

On the flip side, there are also various examples that illustrate missed opportunities in the electrification sector, failing to deliver the desired benefits to women. For instance in the Village Energy Security Programme in India, whilst 50% women membership was made mandatory for village energy committees formed for managing energy projects, a study (Palit et al. 2013) found that women's participation was in reality minimal, or almost absent in most projects, and women hardly took part in any decision-making processes. In a similar story, in Kenya, the Kenya Power and Lighting Company encouraged affirmative actions like Equal Opportunity Policies and Gender Mainstreaming Strategic Plans to attract women technicians, engineers and members of board as long ago as 2008. However, it was found that women had limited involvement in policy decisions and they did not change roles or jobs within the company due to family responsibilities. Moreover, though women did participate in technical training activities, this did not result in increased numbers of women working in the company (Cain et al. 2016). These examples show there are social and cultural barriers that impede even an otherwise conducive policy narrative.

6.7   Policy Reflections

The evidence analysed for this chapter points to some positive trend in integrating gender into electricity policies in all the three countries. In general, the policies acknowledge the need for enhancing women's participation in decision-making and their access to energy services and technologies. In India and Kenya, some of the policies also identify the need to include women through affirmative policies. However, none of the policies have explicitly acknowledged or addressed the gender inequitable access to and control over resources and benefits from electricity-related development interventions. These policies have also missed tracing the link between access to electricity and empowerment, and thus missing the opportunity to systematically and comprehensively integrating gender into policymaking. The policies, as in the past, continue to emphasise on (1) expanding and providing electricity to populations that lack electricity access, (2) making electricity services affordable to the poorest segments of the population and (3) enhancing the availability and reliability of the services.

Whilst national electricity policies may be gender neutral, developed in line with the constitutional requirements of the countries, these policies most often do not pay much attention to women's knowledge in energy management or the potential merit of engaging both genders in the supply chain. They also do not consider the inherent difference in baselines for women and men. Hence, the policies largely remain gender blind and continue to assume that benefits will trickle down equitably to both women and men.

Whilst the importance of producing gender disaggregated data to inform policymaking has been argued for a long time, national statistics continue to use household as the unit of analysis, which camouflages the different effects of electricity access on gender groups. This could also be due to the fact that socially the household is a stronger unit in South Asian countries, and government benefits are provided accordingly. However, lately, some of the sister policies have started to consider women with more prominence. For example, the Prime Minister Housing Programme in India provides subsidy to build homes with provision of electricity and other benefits in the name of the women only.

Although stronger gender link is to be found in the realm of cooking and household lighting (in part because of the legacy of the historical discourse on gender and energy), most of the electrification projects (especially grid) continue to be implemented without articulated concern for gender issues such as benefit sharing or increased opportunities for women's inclusion in supply.

The barriers for employing gender-sensitive approaches in electrification may be linked to their top-down design approach. The impression from our desk study is that there is a lack of documentation of the merit of including gender elements in electrification policies. The commitment of the national governments of the three

countries towards achieving SDG goals (particularly goals 5 and 7) should hopefully reflect evolving characteristics of engendering policy and its processes to achieve the larger goal of gender-just energy policy.

6.8   Recommendations

On the basis of our review, we put forward five policy recommendations for mainstreaming gender in the electricity policies and programmes especially in the Global South:

- First, with national electricity policies in the three study countries tend to be gender blind, more effort is needed to facilitate the inclusion and realisation of gender issues in policy, planning and practice. To increase the likelihood that governments comply with their general commitments to SDGs and SE4ALL goals, effort is required to closely monitor the extent to which investments in the electricity sector reflect gender-informed evidence-based policies and thus accommodate women's interests.
- Second, in order to obtain knowledge on the impact of electricity on gender equality, it would be worthwhile to develop an index for measuring women's empowerment in energy similar to the Women's Empowerment in Agriculture Index (WEAI), which examines women's decision-making power and empowerment in relation to men within their households (IFPRI 2012).
- Third, greater consideration should be given to incorporating women-targeted subsidy mechanism into electricity policies and regulations to significantly impact women's access to electricity for basic services as well as productive use.
- Fourth, to balance the trend that men rather than women are recruited for technical and managerial positions in electricity policy and supply, gender-balanced capacity development and recruitment principles should be encouraged through policy. For example it has been seen that a focus on induction training upon recruitment rather than pre-qualification requirements could help in reducing the exclusion of women from the sector (Winther 2008; Ulsrud et al. 2015). This is likely to strengthen women's participation in all aspects, from representation in policy to employment opportunities.
- Fifth, there is a need to focus on mitigating the risk of women's subordination in energy policies and programmes by fine-tuning electricity policies and interventions. Though there are a number of women-targeted measures such as ensuring women's access to and control of electricity, their inclusion in supply and complementary inputs to support women's economic opportunities needs to be strengthened. Hence, we suggest a stronger alignment between overall policies for gender equality and electricity, as well as harmonising electricity policies with sister policies (i.e. in other sectors like agriculture and rural development). This could help mitigate the causes for gender inequality and also help to identify how electrification could play a more effective role to combat such prejudice.

We would like to conclude that in order to address the skewed baseline opportunities that favour men, there is a need to focus on gender-equitable energy policies as well as creation of inclusive, yet diverse, opportunities for ensuring participation of women in electricity-related policies and programmes.

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Chapter 7
The Impacts of Policy on Energy Justice in Developing Countries

Gudina Terefe Tucho

Abstract Access to modern energy is vital to societal wellbeing and to economic development. Still, the majority of rural households in developing countries do not have access to improved energy systems for basic household energy services. Many energy policies have been devised and several energy projects have been implemented to improve the access. However, many of these policies and energy projects were not successful due to the socioeconomic, cultural, resource and technical conditions present in particular contexts. Major barriers were attributed to the weak understanding of local contexts and societal needs. Nevertheless, some projects considering local social needs through innovative approaches were successful. Hence, improving access to improved energy technology needs to understand local contexts, linking to income generation activities and poverty alleviation and inclusion of women to benefit from the system. A bottom-up approach is sustainable to increase energy access while contributing to poverty alleviation and livelihood improvement.

7.1 Introduction: Energy Access Situation in Developing Countries

Access to modern energy services is vital for societal wellbeing and countries' economic development. A modern energy system in tropical developing countries typically includes having reliable and affordable access to an improved cooking facility and having a connection to electricity (UNDP; Legros et al. 2009; IEA 2011). However, by the year 2009, about 2.6 billion people worldwide relied on biomass energy for cooking and 1.3 billion did not have a connection to electricity (IEA 2011). By the year 2030, the number of people without access to improved cooking technology will increase to about 2.7 billion, and about 1 billion people will remain without electricity. The additional number of people without access to improved

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cooking technology will be due to the increasing population in developing countries. Approximately 45% of the people deprived of access to a clean cooking facility live in Sub-Saharan Africa. Moreover, by the year 2030 about 70% and 50% of the people in this region will remain dependent on traditional biomass energy and without electricity supply. About 50% of the people without access to a clean cooking facility and electricity in Sub-Saharan Africa live in Nigeria, Ethiopia, Democratic Republic of Congo, Tanzania and Kenya. In Ethiopia, more than 95% of the households depend on biomass energy for cooking and over 70% do not have access to reliable electrical energy at least for basic purposes (lighting and appliances). Overall, this represents an enormous electrification challenge, and one that carries real energy policy and energy justice implications.

This chapter will explore the level of accessibility of improved energy in developing countries and discuss the associated socioeconomic and health problems. It also identifies the availability of renewable energy sources which could be used to solve the energy problems. These missed opportunities and continuing challenges as a result of low local community involvement and top-down government and donor policies will be given due emphasis and discussed. Finally, an alternative policy options will be discussed and recommended through which local interests are addressed and access to improved energy technologies are increased.

7.2   Variation in Energy Demand

Typically, household energy demand originates from cooking, lighting, heating and appliances. The variation between household's energy demands exists at the intensity of the energy used and preferences for the technologies providing the services. The variation in the amount of energy for lighting reflects the number of lighting facilities, their efficiency and length of time of use, for example. Hence, households using similar light arrays for the same period consume equal amounts of energy irrespective of their location.

Generally speaking, the energy demand for electronic appliances in rural areas of developing countries is very small due to lack of high energy demanding appliances. Nevertheless, high income urban households tend to use proportionally higher energy for appliances. The energy need for heating depends on the geographic condition. However, most households without access to improved energy services are living in tropical climates where energy for heating is not a big issue. Thus, important demand diversity exists between western and developing countries, as well as between urban and rural households in terms of the energy used for cooking.

In western and temperate climates, the main share of the household energy demand is for heating and appliances (IEA 2008). Energy demand from cooking constitutes the smallest share of the demand presumably due to consumption of processed food. Moreover, the energy system is well organized with efficient stoves using high-quality energy from electricity and gas. In contrast, the demand variation

between rural and urban areas in developing countries is complex. In rural areas, the energy demand for cooking is relatively high as people generally consume unprocessed food that require long cooking hours. Cooking unprocessed food also requires suitable cooking stoves matching local cooking habits. In addition, people do not typically have a facility to store cooked food, thus they cook more frequently. Long cooking hours together with frequent cooking leads to a high cooking energy share in terms of demand, which can account for up to 90% of a household's energy share (Tucho and Nonhebel 2017).

In contrast, urban households' cooking energy demand depends on the socio-economic condition of the households. Urban households are generally connected to the grid, which enables them to use electricity for cooking (though charcoal still remains one of the main energy sources for regular cooking in certain areas). Poor urban households who are unable to afford electricity charges mostly rely on biomass energy for all cooking practices. Though positively, it is also reported in literature that urban households are more likely willing to shift to a modern energy supply following their increasing income (Heltberg 2003). It is noted that urban households are more accessible to semi-processed food compared to rural households who rely on their own food produce. This variation in food type allows the urban household, this to cook with modern stoves.

Various studies illustrate the effect of local energy use, cooking behaviour and customs on adoption and sustained use of improved energy technologies (Wüstenhagen et al. 2007; Kowsari and Zerriffi 2011). Energy technologies failing to fit local cooking habits and foods are frequently not accepted by users. Thus, satisfying the rural developing country's cooking energy demand with western technologies not matching local cooking habit and conditions may not to be possible. Hence, energy technologies fitting local food and cooking habits need to be identified and provided, taking into account their modification with the available local materials, for instance biogas cooking stoves can be modified with local materials to the prevailing cooking contexts.

7.3 Impacts of Poor Accessibility to Improved Energy Supply

A lack of access to improved energy technologies carries many socioeconomic and environmental impacts. In developing settings, the most important environmental impacts are decline of common forests, exposure to indoor air pollution and increase in greenhouse gases emissions (Ruiz-Mercado et al. 2011; Kaygusuz 2012). The socioeconomic impact of lack of access to improved energy access is high particularly on women and young girls traditionally in charge of household activities. Women spend most of their productive time on extraction of firewood rather than using for income generating activities, going to school and other social activities (Wodon and Blackden 2006).

Most households in developing countries frequently cook food with wood obtained from common forests. Common forests are public resources with unrestricted access where everybody can have the right to use without any limitations. Common forests also serve as an additional means of income for poor urban and rural households selling firewood and charcoal. For instance, a large proportion of people in urban areas and those in small business such as local coffee sellers, use charcoal despite having access to grid connections. This heavy reliance of both rural and urban population on biomass for energy and income aggravates the intensity of firewood scarcity and deforestation (Allen and Barnes 1985; Arnold et al. 2006). In particular, the rate of deforestation is high in countries where large groups in the population depend on biomass energy for cooking. Ethiopia, Nigeria and Uganda are among the countries of the world with the highest wood fuel biomass pressure and high rate of deforestation (Putti et al. 2015). Nevertheless, with a good policy and integrated management these public resources can be one of the sustainable alternative energy sources.

The vast majority of households in rural areas of developing countries continue to depend on biomass energy used in open fire stoves for cooking. Open fire stoves convert only about 10% of the energy content of the biomass (Bhattacharya and Abdul Salam 2002; MacCarty et al. 2010).This means that 90% of the energy contents of the biomass dissipates into the open air without providing any gain. Satisfying the cooking energy demand of people using open fire stove requires a large quantity of wood from public forests. Continuous abstraction of large quantity of forest wood will have significant impact on the availability of wood supply. When firewood is critically scarce, households are often forced to shift to crop residues and dung to supply their firewood demand. For instance, in highland areas of Ethiopia where firewood is scarce, dung substitutes about 30% of the firewood demand (Bewket 2005; Duguma et al. 2014). In most cases, crop residues are burned on agricultural land to supply nutrient to soil for the next farming season. Removing and using of crop residues directly for the energy purpose affects the availability of nutrients to the soil (Lal 2009; Duguma et al. 2014). Thus, heavy dependence on both common forest and agricultural bio-wastes for use in traditional stoves significantly affects the local environment.

A lack of availability of biomass and its use in inefficient stoves may also carry a range of socio-economic and health consequences. When fuel woods are scarce, people will be forced to walk long distance to where sufficient firewood is available. This imposes huge burden on women and young girls who are traditionally in charge of household chores and firewood collection in addition to other activities. Due to the additional burden, women daily spend much more time on domestic activities than their male counterparts. Women may spend about 2–4 h per day to collect fire wood, heightening the risk of becoming deprived of education and other more productive activities (Blackden and Wodon 2006). A comparative overview of daily working hours of men and women in Sub-Saharan Africa is shown in Table 7.1. As shown in the Table and related literature, women in the region are forced to work more than 12 h per day due to increasing time for firewood collection. As a result, more than 50% of them are time-strapped for other activities (Wodon and Blackden

Table 7.1 Time spent on different activities by men and women (mean hours per day) in Sub-Saharan Africa

	Daily activities	Men	Women
1	Care work	0.10	1.0
2	Domestic work	1.5	5.5
3	Firewood and water collection	0.04	1.5
4	Work inside the household (1 & 2 & 3)	1.5	8.0
5	Work outside the house	5.0	4.0
	Total work time (4 & 5)	6.5	12.0

Source: adapted from Wodon and Blackden (2006)

2006). Spending such an amount of time on household chores will have huge impacts on the productive time these people have in order to contribute to the economy of the family. As a consequence, they are deprived of the time needed for education, to take care of children, generate income, farm and interact socially. In particular, a lack of sufficient time for children will have significant effects on the development of the children and on their health condition.

It was shown that one-third of the world's population burn wood, dung or charcoal for cooking, heating and lighting (Birol 2011).The use of biomass in inefficient stoves produces incomplete combustion by-products (ICB), which are hazardous to human health. Burning biomass involves smoke containing a large number of pollutants of known health hazards including particulate matter, carbon monoxide, nitrogen dioxide, formaldehyde and polycyclic organic matter, including carcinogen agents. Exposure to indoor air pollution from the use of solid biomass fuels has been reported as a causal agent of several diseases in developing countries. Exposure to these indoor air pollutants is associated with an increase in the incidence of respiratory infections, including pneumonia, tuberculosis and chronic obstructive pulmonary disease, low birthweight, cataracts, cardiovascular events and all-cause mortality both in adults and children, for example (Ezzati and Kammen 2002; Fullerton et al. 2008).A recent report by World Health Organization (WHO) shows that more than four million people die prematurely annually due to illnesses attributed to the indoor air pollution caused by inefficient use of solid fuel for cooking (WHO 2016). In addition, a lack of access to improved energy services also includes energy for lighting. Most rural households use kerosene wick lamps, which produce several hazardous by-products such as black carbon, with serious implications for human health (Lam et al. 2012). Kerosene is also very expensive, meaning it carries detrimental economic, environmental and health effects (Pokhrel, Bates et al. 2010; Lam et al. 2012).

The vast majority of Africans lack of access to modern energy services, which constitutes amajor obstacle for achieving wellbeing and economic development. Improved access to energy for the poor and marginalized communities would make a significant difference in the fight against poverty. More than in any other region in the world, access to affordable and suitable energy services in Sub-Saharan Africa particularly needs to grow in order to improve the standard of living of the region's growing population.

Although the foregoing discussion has focused largely on the domestic sector, access to modern energy is not limited to the household services for cooking, lighting and powering of small appliances; it also extends to the energy use for agriculture. The paradox is that the agricultural sector—the major sector in the region—accounts to a very small modern energy use, despite employing the largest number of working population and contributing to the major share of the national domestic products (GDP) in most African countries. Like cooking methodologies and fuels, agricultural production remains largely traditional, being implemented by human and animal power. Modern, reliable and clean energy would enable living conditions to be transformed and in turn, would increase industrial, agricultural, urban and rural development.[1] However, in many countries the electrical energy loss surpasses 30% and not reliable. The unreliable and costly supplies of electricity and modern fuels hampers production, growth and development. Hence, increasingly high oil import bills and financial losses experienced by many Sub-Saharan African constitute huge economic growth lag in the region.

7.4   Evolving Energy Policies in Developing Countries

For much of the last 200 years, the steady growth in modern energy consumption has been closely linked to rising levels of prosperity and economic opportunities across the globe (Sokona et al. 2012). However, high inequalities persist in the worldwide distribution of access to modern energy services. In particular, people in Sub-Saharan Africa experience the lowest per capita access to modern energy compared to others in the developing world. In this context, the most immediate energy priority is to expand access to meet the population's social and economic development agendas. Yet despite recognition of the need to expand energy access, the definition of energy access is ambiguous and not universal.

Access to electricity is often defined as the proportion of households supplied by the electricity system compared to the total number of households overall, or as a lack of access to clean cooking facilities. Yet it neglects the energy for productive services. In principle, access to energy for the poor needs to include the energy required to drive economic growth and to generate income. Access to modern energy also needs to consider the provision of and ability to afford and use modern and clean fuels for basic human needs, productive uses and modern societal needs like entertainment. Thus, a more comprehensive definition addresses the need for modern energy services to improve the livelihoods of the poor while at the same time, using modern energy to drive local economic development on a sustainable basis.

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[1] Although it must be acknowledged that other burdens and trade-offs will occur from this modernization.

Many energy policies and programs have been attempted to provide improved energy facilities to households living in rural areas of developing countries. Major progress began during the 1970s and 80s, when the relationship between wood-based fuel and deforestation became known (Allen and Barnes 1985; Arnold et al. 2006). The mitigation efforts made ever since and still ongoing vary across the regions and countries due to differential priorities and capacities yet in principle, it is a well acknowledged fact that providing improved energy facilities requires a lot of investments (Brew-Hammond 2010; IEA 2011).The principal energy sector transition of the 1990s made through privatization and reform of energy supply utilities, has helped the utilities improve their accessibility and guarantee a provision of electricity to those able to pay but did not include the poor (to a certain extent) (Sokona et al. 2012). This success implies the need for further policy, social and institutional support in order to harness the great potential natural energy resources of the region and promote sustainable development. Particular emphasis needs to go towards the evaluation of existing practices and processes, national development policies and institutional set-up, and to the problem context and conditions across the region. Further, a new approach is required to achieve regulatory reforms targeting poverty reduction agendas and the needs of the local populations within microeconomic contexts. In this way, the energy access agenda needs to solve these fundamental problems and be broadened to an inclusive vision of the economy rather than narrowly focusing on the household energy sector.

Largely speaking, most of the improved energy implementation programs were organized centrally as a top-down approach. Such programs usually neglect local practices and user interests, and yet failing to take public interests into account in these programs strongly affects the implementation and sustainability of the system (Ni and Nyns 1996). Recent literature on the global improved biomass cook stove programs shows lack of success in most of the top-down approach programs due to their failure to address local interests and culture, for instance (Urmee and Gyamfi 2014). Similar constraining factors are observed with the biogas implementation programs (Mwirigi et al. 2014; Getachew et al. 2016). India and China are the leading countries in developing cost-effective biogas digesters and dissemination (Bond and Templeton 2011). Many of the Sub-Saharan African and other Asian countries who also followed their footsteps and developed their biogas programs, now remain at a standstill, with only a few success stories to be found (Parawira 2009; Mengistu et al. 2015). To mention some, Ethiopia, Uganda, Tanzania and Rwanda are some of the Sub-Saharan African countries that adopted the biogas technology and implemented this through their national biogas program (NBP). The problem is worse in rural Sub-Saharan Africa where about 95% of the population still rely on the traditional use of biomass energy. Failure to articulate local interests and conditions affects the progress of modern energy technology adoption, installation and use (Ni and Nyns 1996; Urmee and Gyamfi 2014). Hence, these factors should be understood from the grassroots level before starting any improved rural energy programs.

The practice of providing access to modern energy services to the poor in Africa is complex, mainly due to the dual nature of the energy system across Sub-Saharan

Africa where in some instances, traditional and modern energy systems and practices co-exist. As noted above, rural household energy is often dominated by traditional modes of production and use. On one side, there is overlapping of modern and traditional energy use in urban areas where access to electrical energy and traditional technologies exist. In many urban areas across Africa, the simultaneous use of biomass fuels, kerosene or electricity is also common including among economically better-off households. Thus, when other socio-cultural dimensions are taken into account, the distribution of modern energy access across Sub-Saharan Africa and increasing access for a growing population becomes even more challenging. Provision of modern energy requires availability of sufficient renewable energy resources which can achieve sustainable service provisions.

7.5   Renewable Energy Resources

The provision of improved energy services for developing countries requires the availability of a sufficient amount of energy resources, which can be obtained from a variety of sources. In western and oil-rich countries, the demand for household energy is still largely met by fossil fuel sources. Yet due to growing environmental concerns and rising oil price, fossil fuel sources cannot be a long-term realistic option. Instead, and positively, most of the countries deprived of access to improved energy services have tropical climates, presumably with abundant renewable energy resources.

Of course, renewable energy resources are not evenly distributed across the world, regions and countries and within the country itself, but they (solar, wind and hydro) are suitable to provide electrical energy for large and small scales, where the small-scale application of hydro and wind depends on their local availability.[2] The effects of these conditions can be small on local solar energy because of the uniformly arriving solar radiation on certain locations. However, their local potential sufficiency for the demand is very necessary.

Until sixteenth century, humanity depends on biomass energy for all household services. The first transition started in England with the introduction of chimneys and suitable grates when consumers in urban areas started switching from wood fuels to coal (Fouquet 2010). Since then, mankind has gone through several energy transitions in the past five centuries, although the most significant progress is made around the late 1950s (Fouquet and Pearson 2012).

Given the known negatives of biomass energies, initiatives to formulate biomass as alternative energy policies based on recognition, formalization and modernization of the sector are not appreciated by decision-makers in government, whose vision of economic growth and poverty reduction is usually based on fossil fuels and electricity (Owen et al. 2013). The same applies to the use of charcoal. The production, use and trade of charcoal for domestic cooking and heating is also char-

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[2]Which itself is determined by the local geographic and climatic conditions.

acterized by contradictions, stereotyping, and misconceptions of its negative consequences (Mwampamba et al. 2013). Nevertheless, biomass can be a better alternative to meet the demand if income generation activities are integrated and promoted through an enabling framework involving sustainable biomass supplies and value chain considering better technologies.

Biomass can be obtained from different plant sources in different forms and can be divided into "common" and "produced" resources. Common resources are those owned collectively for free access. These are public forest resources open for everybody to use without limitations. Produced biomass, on the other hand, comes from the private land resources and its availability relies on the presence (ownership) of land resources and its yield (Berndes et al. 2003). The availability and productivity of land varies from place to place and from scale to scale, usually being unevenly distributed. Thus, the availability of biomass at household level depends to some extent on a specific households' resource ownership. Households holding a large area of land can produce an excess of biomass, while those holding a small parcel of land can hardly produce enough. In addition, households can freely decide whether to use their bio-wastes for energy supply or for soil mulching and for animal fodder and food.

The potential at individual household level is vital for the implementation of biomass energy technology that could deliver continuous functionality and sustainability. Hence, the potential at household scales needs to be understood, taking into account household ownership and competing purposes. It is also important to note the land-use system of the households to identify free and non-agricultural lands. Households may have degraded, marginal or extra lands for tree planting and use for energy, as well as for income generation. Planting tree for both energy and income helps households to have sustainable energy supply while providing an economic incentives (Gebreegziabher and van Kooten 2013; Meilby et al. 2014).

7.6 Drivers of Energy Transition in Developing Countries

It has been indicated that mankind has gone through several energy transitions in the past five centuries, with major progress in the twentieth century (Fouquet and Pearson 2012). The twentieth century transitions were driven by the invention and the development of more fuel types, technological changes and service restructurings. These historical transitions are relevant in understanding the perspective of the current energy transition in developing countries which may follow similar trends. Energy transition is a slow process taking over 100 years (Fouquet 2010), a complete transition may not be expected in short period of time. However, a good progress can be achieved due to increasing penetration of electronic appliances operated on electricity.

Currently, people have different choices of energy sources and technologies. In particular, the present advanced communication technologies are vital to make

people aware of the advantage of modern energy services. The increasing demand for micro-electronic appliances is a good example. A recent estimate shows that more than one in three Africans had at least one mobile subscription and about 76% of the population has Global System for Mobile communication (GSM) coverage although the electrification rate in their countries is still about 30% (Smertnik et al. 2014; IEA 2015). According to this estimate, more than 358 million people in Sub-Saharan Africa are covered by mobile networks despite not having access to an electricity grid. All these technologies require electrical energy for their operation which may foster expansion of electricity and its access. Mobile phone provides a lot of economic and social benefits to rural households. This attracts an innovative mobile phone charging business in some Sub-Saharan African countries. The mobile phone charging micro-business in Tanzania and Uganda could be a good example (Collings 2011). Experiences from Uganda and Kenya shows an expansion of solar technologies to rural areas for phone charging which also significantly contributed to reduction in kerosene use (Stojanovski et al. 2017).

In addition, improvement in education can be a stimulus to aim for a better life and improved energy access. In many developing countries, education is considered as a basic human right where every child should go to school at least for basic education. It has been shown that adoption of improved energy technology increases with the level of education and technology penetration (Lewis and Pattanayak 2012). To date, it is not uncommon to find a television set in remote rural areas among households able to afford diesel generators or solar PV. Thus, an increase in demand of micro-electronic appliances and awareness can be big drivers for improved energy technology adoption and use. What is more, these conditions can shorten the duration of the transition to low carbon energy and efficient technologies. These technologies require electrical energy, which can be managed by stand-alone solar energy technologies.

7.7 Energy Transition and Donor Policy in Developing Countries

Innumerate energy transition policies have been proposed at a global scale to transform the traditional energy system towards more efficient energy technologies. For a long time, the transition of household energy system was explained with the prominent energy ladder model (Fig. 7.1), which considers the household socioeconomic situation as the driver of the transition (Leach 1992).This model has been criticized for its linear transition mode since an increase in household economy does not necessarily achieve a complete transition from traditional to modern energy system (Masera et al. 2000; van der Kroon et al. 2013). It is obvious that an increasing income helps households to afford the costs of the technology. However, the decision to adopt and use the technology depends on the local conditions. A survey report from different villages in Mexico affirms that stove types, cooking practices,
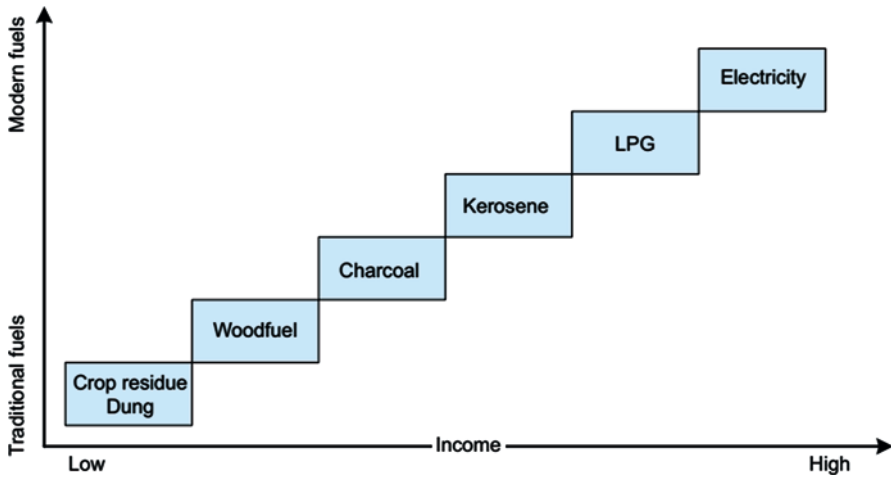
Fig. 7.1 A classic energy ladder model (Kowsari and Zerriffi 2011)

fuel economy, accessibility conditions and cultural preferences came to be the main household decision tools, for instance (Masera et al. 2000). This decision also varies between urban and rural households. Urban households with better incomes more likely adopt and use improved energy technology than rural households (Heltberg 2003). It is evident that, socio-cultural factors related to the demand and the availability of local resources can be more important than increasing income to achieve the transition in rural areas (Kowsari and Zerriffi 2011). This indicates the complex behaviour of rural energy transition which money alone cannot solve.

The development and implementation of clean cooking energy technology for households in developing countries are relevant to at least five of the Sustainable Development Goals (SDGs), including Goal3: Good health and well-being; Goal 5: Gender equality; Goal 7: Affordable and clean energy; Goal 13: Climate action and Goal 15: Life on land (Rosenthal et al. 2018).Yet addressing the SDGs related to energy and achieve the low-carbon energy transition requires an understanding of the trade-offs and synergies between the opportunities they present. In particular, an increasing access to renewable energy consumption has a positive impact on economic development and poverty reduction. Nevertheless, at the same time, most energy policies in developing countries focus on large-scale grid electrification directly and the majority of the big energy projects are often linked to foreign donations. Getting access to these foreign donations involves a lot of bilateral gaming and discussions and the negotiation process is mostly led by donors' interest and objectives. In the processes, the receiving countries may compromise the citizens' interest to comply with the donor interest. In addition, some researchers argue that the transition possibilities in countries with low access to modern energy are shaped by post-colonial legacies and political agendas, where non-western traditions of thought are overlooked (Broto et al. 2018). Thus, the effectiveness of aid can be further affected when political ideology differs between the donor and the recipient

(Dreher et al. 2015). In this regard, addressing poverty, climate change and energy security requires awareness on association between energy systems and social justice, typified by the situation in which all individuals have safe, affordable and sustainable energy access.

A sustainable energy transition in a developing country context requires an integrated policy approach involving local resources availability and viable technological options that match local demands and contribute to livelihood improvements. To achieve this, the following specific basic questions need to be taken into account. Are there sufficient renewable energy resources available for the demand? Are there efficient technologies available to convert renewable resources into suitable type of energy to meet the demand? Are the technologies affordable and do they match local socio-cultural conditions? Are they applicable with low labour requirements? Do the technologies and projects contribute to economic development and poverty alleviation?

The energy transitions processes is further geared towards questions of ethics and justice, which include the notion of fair distribution of energy infrastructure, allowing equal and equitable access to decision-making and services, and participation of marginalized groups. Failure to adequately engage with the questions of justice and energy transition process may aggravated poverty, entrenched gender bias and non-participation of the locals (Jenkins et al. 2018). As a particular strategy then, energy justice focuses on the evaluation and identification of the affected and the existing processes to provide solution and reduce injustice (Jenkins et al. 2018). It does so by focusing on distributional, recognition, and procedural justice issues, considering the equitable distribution of benefits and costs by stressing the need for inclusion and equal participation in decisions through recognition, in this case, the diversity of needs, values and interests of the locals (Williams and Doyon 2019).

7.8   Sustainable Policy Alternatives

The provision of affordable and sustainable energy supply is one of the key options of improving the livelihoods of millions of poor people in Africa. Small-scale biogas technology has huge potential to satisfy domestic energy needs and provide numerous economic and environmental benefits. Most Sub-Saharan African countries have adapted the Chinese and Indian biogas technologies and tried to disseminate through their national biogas programs, with the financial support of funding agencies. However, widespread adoption of the technology and its continuous functionality were not achieved due to various socioeconomic, cultural, technical and attitudinal factors (Mwirigi et al. 2014; Getachew et al. 2016). This implies the importance of local conditions and missing opportunities as a result of ignoring or giving them less considerations.

Sustainable supply should give greater emphasis to productive uses of energy and energy for income generation. This helps to contribute to generation of higher incomes through the mobilization of local resources, technologies and financial

resources (Brew-Hammond 2010; Rupf et al. 2015). There are some successful energy projects with special innovative approach integrating income generation based on local needs. One of these is a Solar Sister project in Uganda, Tanzania and Nigeria implemented through innovative women-to-women entrepreneurial networks providing a wide range of high-quality clean energy products. This projects provides access to clean energy alongside its value in terms of a long life-cycle, and the creation of a new value chains through micro-entrepreneurship and networking of multi-stakeholder partnerships (Heuër 2017). Solar Sister always consults with the community leader first and then seeks to include households in their initiatives. The Solar Sister field agents consist of local women recruited, trained and mentored by Solar Sister to set up their independent clean energy micro-enterprises. This focus on woman-to-woman sales is an innovative way of introducing new technology in rural households where women are the primary users and managers of household energy. It has been recommended that there should be promotion of the biogas technology through empowering females and female headed households by providing access to credit and income beyond promoting adoption of biogas technology (Getachew et al. 2016).

The production of biogas can be resource-efficient and viable for cooking when arranged at a village scale in a co-digestion mode. Arranging co-digestion at the village scale enables use of any available organic wastes. This approach is helpful to avoid inter-household variation and resource scarcity owing to sharing of resources and increasing performance efficiency of the digester. Co-digesting different waste also streams increases the performance efficiency of the digester and its biogas yield (Giuliano et al. 2013), thus improving the productivity of the system and reducing the amount of feedstock needed to meet the demand. Furthermore, applying co-digestion at a village scale provides the possibility of using any organic wastes such as human excreta and crop residues.

A community biogas system established on shared household resources may involve several challenges since households have vested interests in their resources. Households living in rural areas tend to have strong family cohesion, and a culture of social cooperation and dependence. Socio-cultural bonds are powerful in influencing the individuals' living conditions and to solve any societal problems. Households generally closely follow the rule of socio-cultural obligation or else they are considered deviant. This dynamic can be harnessed in the development of the community energy system, to embrace households and influence them to follow the rules of the system. A community biogas system in rural India serves as a good example in which households within the village shared their resources for the common benefits (Reddy 2004). In this project, households contributed their cow dung for communal biogas digester installed to provide light energy for the village. Households can find a solution for their problems if they are allowed to participate in decision processes. For instance, inequality in resource sharing can be easily avoided through the exchange of labour. This means that households with small amounts of feedstock can contribute labour for the collection of feedstocks and feeding of the digester. This approach is essential to reduce the costs of distribution and labour for collection of feedstocks. Accordingly, households can hand-over

their bio-wastes and collect biogas in return. Hence, households do not necessarily settle densely in a village to qualify for a pipeline distribution system. Households living nearby can cooperate and install the technology to get the energy and slurry benefit out of it. A communal energy system may not be affected by inequality among households and their living conditions.

The sustainability of biogas production depends on the labour spent on daily collection of feedstock, water and removal of its slurry (Tucho et al. 2016). Yet the issues of labour are not a significant concern with a community biogas system, given that the working load is well distributed. What is more, a larger reduction of resources and labour can also be achieved through biogas system integration. The integration of latrine and livestock farming with a biogas digester, for example, can reduce the demand for additional feedstock and water. With this, biogas production will become part of livestock farming, where the water used for the cleaning purpose can be directly applied to the digester. This mechanism also reduces operational costs that would be incurred when run as an independent system. In this way, biogas system integration helps to overcome possible limitations related to resources and operation of the system (Chen et al. 2010). This means that provision of technical and financial support is easier to arrange at a community level than at individual household level.

The integration of energy systems into income generation activities can also be a better approach to enhance the households' financial capacity to afford related costs (Brew-Hammond 2010). This approach can be vital for improving the economic capacity of the households, and especially that of women through provision of targeted financial support to activities contributing to both income and energy. Livestock smallholder businesses can be a better option to provide sufficient dung and urine at nearby locations in addition to income. These businesses are best known for their pro-poor, less capital-intensive, quick economic return, and sustainability in addition to the benefit for energy provision and use (Wambugu et al. 2011). Transforming and improving feeding from field grass to stall-fed conditions would substantially improve the quality of dung and provide easy access to the livestock's urine. The income generation activities can be applied at a household scale but are easier to apply at a community scale in many aspects (labour, technical and financial support). The application of a community energy system may not be straightforward, but it is critical. In general, an enabling policy with better understanding of local resources, demands, business, social relation and customs is needed.

7.9   Conclusion

The provision of modern energy access to people in developing countries requires a better understanding of the local socioeconomic, cultural, availability of resources and capacity and needs to adopt the technology. Many of the past policies tried to

solve the energy problems through top-down project implementation approach. This approach neglects the needs of the people, ignores their participation in planning and decision-making. As a result, many of these projects were not successful in their goal to provide modern energy access to the poor. It is apparent that provision of modern energy access to the poor requires an understanding of their needs and thorough integration into income generation activities. An integration of energy supply with income generation will be achieved by involving households (and particularly women) in the process of planning, local resources mobilizations, decision-making and implementation. As a result, the integration of the energy supply with income generation streams will help towards poverty alleviation and improve the economic capacity of the households for better technology adoption and realization of energy transition: key developments towards the attainment of the Sustainable Development Goals.

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Chapter 8
Sociomaterial Solar Waste: Afterlives and Lives After of Small Solar

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Abstract The problem of solar waste from off-grid technologies is attracting increasing attention. This chapter argues that solar waste represents multiple matters of concern; it is a problem of pollution, resource, and social ruin all together. It suggests that while an energy justice framework is well suited to identify issues of distributional, procedural, and recognition justice in relation to solar waste—what we refer to as "afterlives"—there is a need to engage with postcolonial theories of ethics in order to better grapple with different kinds of social ruins solar waste may represent—what we refer to as 'lives after'.

8.1 Introduction

Globally, Solar Photovoltaic (PV) deployment has grown at an unprecedented rate since the early 2000s. In the context of the Sustainable Development Goal (SDG) of securing access to electricity for all, off-grid solar has become a dominant technology. Indeed, the latest Off-Grid Solar Market Trends Report published by the World Bank Group's Lighting Global Program shows that the global off-grid industry has seen dynamic growth in the last decade, with an estimated 130 million off-grid solar products sold and 360 million people reached globally since 2010 (GOGLA 2018). In the context of this rapidly expanding market for off-grid solar devices, and along with increasing awareness of the limited life span of small solar-powered devices, the question of what happens to solar devices and their components when they reach the end of life is increasingly timely.

The future challenge of solar PV waste is a global phenomenon. A recent report from the International Renewable Energy Agency (IRENA 2016) estimates that by 2050, global cumulative PV waste volumes could reach 78 million metric tonnes.

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According to the report, this does not only represent a significant challenge in terms of waste management, but also represents significant economic value. The raw materials recovered from PV panels alone could cumulatively yield a value of up to USD 450 million (in 2016 terms) by 2030 (IRENA 2016).

Although a global challenge, solar waste is not the same kind of problem everywhere. As is the case with waste more generally, there are both empirical and conceptual differences between waste in the Global South and waste in the Global North (Millington and Lawhon 2018). Focusing particularly on the Global South and the problem of off-grid solar PV, the Department for International Development (DFID) commissioned a report in 2016 to investigate this issue in this context. The report 'Electronic Waste (E-Waste) Impacts and Mitigation Options in the Off-Grid Renewable Energy Sector' (Magalini et al. 2016) seeks to quantify the extent of solar waste coming from off-grid applications and argues that while the issue of solar waste is still small compared to the scale of the challenge of e-waste more broadly, the current amount of solar waste compares to the amount of e-waste coming from mobile phones. It is also expected to grow significantly.

In both reports, the challenge of solar waste is predominantly framed in terms of establishing the quantity of waste for the purpose of recycling and value extraction. Approaching solar waste in this way makes it a problem of waste management, of encouraging appropriate waste regulations, waste infrastructure and recycling technologies. Yet while the need for waste management is indisputable, the critical question to ask is whether a focus on recycling and waste management alone risks bypassing other opportunities and economies of repair and recycling (Cross and Murray 2018) and whether it hides a number of potential environmental and energy justice issues in the process.

While the question of solar waste is relatively new in the context of off-grid solar technologies and energy access, a rich literature already exists in the broader area of e-waste, which has much to offer in terms of developing a more nuanced understanding of the social life cycles of solar devices as these reach the end-of-life stage. We begin to integrate these insights throughout this chapter. Another aspect that often gets lost in these end-of-life discussions is that of what happens to people's lives, livelihoods, and lifestyles when solar breaks down. By further considering this issue, our analysis adds novelty to the discussion of solar and e-waste.

Why do we want to talk about solar waste at all and specifically with a focus on off-grid solar? Solar in the form of large parks and PV panels is already under discussion and with good reason (IRENA 2016). These large solar installations focus waste in a small area and create hazardous situations. They also make the problem of solar waste visible. In contrast, the waste from off-grid solar is distributed and almost never appears in large quantities; nevertheless, the growing spread of off-grid solar still means that a lot of waste will be generated every year. Yet research in this area is still limited.

The Global Off-Grid Lighting Association (GOGLA)—one of the leading industry associations for off-grid solar—only started tracking sales in 2011, and the distributed nature of off-grid solar devices makes them difficult to account for. Nonetheless, and as outlined above, efforts to estimate future quantities of elec-

tronic waste in the renewable energy sector in Africa *have* been made (Magalini et al. 2016). This is an important task and one that touches on a number of potential ethical questions around the distribution of socio-environmental hazards and benefits. Thus, the framing of the problem as a technical or material issue must be complemented by an enquiry into the 'social side' to avoid obscuring important aspects of solar waste (Cross and Murray 2018; see also Sovacool et al. 2018 for a discussion on how technical focus can obscure other societal energy justice issue). At the same time, anticipating and evaluating the volume of future solar waste necessarily involves following material waste flows.

Understanding the social side of solar e-waste and the potential 'ruins left behind' requires a different approach, not following the material waste itself, but the lives of people who come into contact with solar devices as they transition from energy to waste. This raises a different ethical question of responsibility not just for the materials included in solar energy provision, but also for the social lives it touches. Building on this idea, this chapter uses empirical insights from two ethnographic case studies. The first one focuses on the handling of solar waste at a Waste Electrical and Electronic Equipment (WEEE) Centre in Nairobi, Kenya. The second one pays attention to the spaces left behind, the so-called 'social ruins of wasted solar' in Bihar in India.

8.2 Conceptual Framework: 'Matters of Concern' for Energy Justice at the Stage of Post-being

What kinds of ethical questions are to be raised in relation to solar waste? What kind of matter of concern is it? What should we be concerned about? And what kinds of concepts and evaluation frameworks are appropriate in order to grapple with these concerns? In order to address these questions, we turn first to Science and Technology studies (STS) and the analysis of matters of concern.

The analysis of 'matters of concern' as opposed to 'matters of fact' is a key approach in the STS literature. Latour (2004: 232) first argued for a move from matters of fact to matters of concern in 2004 stating, 'Matters of fact are only very partial and, I would argue, very polemical, very political renderings of matters of concern and only a subset of what could also be called *states of affairs*'. By applying the lens of matters of concern to solar waste, we pay attention to the work of framing a problem in a particular way and both the political and material consequences this carries. Mol (2002) has referred to this process of framing or enacting an object in a particular way as ontological politics. It follows that the ontological politics of solar waste determine what kind of a problem—or matter of concern—solar waste is understood to be and therefore what needs to be done about it.

As has already become clear in this introduction, solar waste can be framed as not either an environmental hazard or a potential economic resource, but as both. As is the case with the broader category of e-waste, this makes it thoroughly compli-

cated to answer the question of what should be done about it (Lepawsky 2018). Thus, in recognising the multiple matters of concern arising from a focus on solar waste, this chapter considers three different renderings of solar waste as a matter of concern. In Sect. 8.3, we focus on solar waste as a matter of pollution and hazard. In Sect. 8.4, we are concerned with solar waste as a resource and as a commodity in the global trade of e-waste. Finally, in Sect. 8.5, we are concerned with social ruins solar waste leaves behind.

Questions of waste and questions of energy are predominantly considered in separate academic literatures. Solar waste, however, brings these together both empirically and conceptually. Solar panels are energy access first and waste after, and we therefore investigate solar waste as part of the energy provision *and* the energy access agenda. As one particularly profitable avenue allowing such an approach, the growing field of energy justice provides an interdisciplinary, inter-literature framework for identifying and considering injustices within the whole system of energy provision, including the stages of production and consumption (Bickerstaff et al. 2013; Jenkins et al. 2016). Here, this connects our thinking of solar waste as a matter of concern to a systems approach.

The three-legged analysis of distributional, procedural, and recognition justice which is central to the energy justice framework (Jenkins et al. 2016) provides a useful tool for identifying 'sites of injustice' relating to different configurations of energy provision. Yet while a concern for post-consumption issues and externalities such as negative impact on future generations is a key part of energy justice concerns (Sovacool et al. 2017), these have so far been less developed. In this regard, end-of-life solar waste challenges the traditional boundaries of an energy justice approach. Because solar waste is what happens when a particular configuration of energy provision falls apart or ends, it sits somewhat precariously within an energy justice framework, which predominantly focuses on systems of production and consumption. In this chapter, postcolonial theory and notions of ethics serve as a complementary lens in order to better approach the question of solar waste and the justice and ethics concerns related to it. Postcolonial theory studies the cultural legacy of colonialism and imperialism. As such, it challenges an energy justice analysis to consider the specific geographical and historical contexts in which solar waste emerges and is handled (Castán Broto et al. 2018). It addresses therefore one of the core shortfalls of the energy justice framework, which is its reliance on western conceptualisations and universalist notions of 'justice' (Sovacool et al. 2017; Castán Broto et al. 2018).

Considering what happens after energy provision, Gupta (2018: 73) has shown how large-scale development projects like dams face widespread resistances in the stages of planning and construction but are forgotten once established: 'in the limelight in the phase of "becoming" but disappear from social scrutiny, discussion, and debate in the phase of "being"'. In case of energy access projects, the aim of providing access to people is the locus of all attention. Once access is thought as 'achieved', attention shifts to new places that still lack access. Whether access endures or where it is 'achieved', is not a prominent issue (Kumar et al. 2019). There is even less focus on what, following Gupta (2018), we can think of as post-being/after-being,

the stages of ruins and renewal. This chapter seeks to bring this post-being/after-being phase of energy access into scrutiny through our discussions of solar waste given that despite common misconceptions, the material and social 'lives after' solar energy are not external to the whole energy system.

To tackle this, we engage with the idea of 'ruins' rooted in postcolonial literature. Stoler (2013: 11) explains ruins as 'both the claim about the state of a thing and a process affecting it'. As a noun, it focuses on the state of things, and as a verb it points to the projects and process of ruination. The process leading to ruins, ruination, Stoler (2013: 11) suggests, 'is an ambiguous term, being an act of ruining, a condition of being ruined, and a cause of it. Ruination is an act perpetrated, a condition to which one is subject, and a cause of loss. These three senses may overlap in effect, but they are not the same'. Indeed, ruination is a politics that chooses certain places, people, relationships, and things to 'lay waste'. As Howe et al. (2015: 4) remind us, 'historical studies of environmental justice controversies highlight the long-time role in different political power in decisions about waste disposal infrastructure'.

Stoler (2013: 10) notes that the ideas of ruins and ruination offer critical insights for 'grounding processes of actual decomposition, recomposition, and renewed neglect'. Taking a lead from Stoler as we look towards ruins, the fact that there is a 'constant struggle between renewal and ruination' becomes important to confront (Gupta 2018: 73). When we look at solar waste in particular, we observe these processes of renewal through a focus on resource and recycling and ruination through a focus on environmental degradation and lives after. More importantly, we also observe that unequal global and local relationships of power mean that waste embarks on the pathway of renewal for some and ruination for others. In the same way, some benefit from the pathway of renewal of waste as resource while others lose from the pathways of ruination of waste as environmental hazard and wasted lifestyles. This is one fulcrum of the ethical conundrum that waste opens: renewal for some and ruins for others.

In line with Stoler (2013: 9), the consideration of solar waste as a matter of concern opens up the ethical opacity 'between the elusive vectors of accountability and the lasting tangibilities in which ruination operates—and on which such formations thrive'. Through these matters of concerns and our ethnographic focus on specific sites of emergence, disposal, and renewal of waste, we offer a 'situated perspective that acknowledges certain types of insufficiencies as they exist at specific historical moments and geographical locations' (Howe et al. 2015: 6).

8.3 Solar Waste as Pollution and Hazard[1]

A prominent matter of concern in relation to solar waste is pollution. Framing solar waste as a problem of pollution, this section brings out questions of toxicity and hazard both to the environment and to human health. It is concerned with the

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[1] We would like to thank Pirasanth Balasingam for help with the analysis in this section.

questions of what kinds of hazardous materials are contained in solar waste and what kind of future problem they represent.

8.3.1   What Is in Solar Devices?

The first point we address is the lack of information about the hazardous materials in solar products, their levels of toxicity, and their impacts on the environment and human health. Solar waste contains a number of hazardous constituents such as toxic, rare, and precious metals. Solar lanterns and solar home systems (SHSs), the two most common solar products available on the market, comprise at least seven basic different components (Fig. 8.1) out of which lithium-ion batteries, solar panels, and electric wires contain the largest amounts of hazardous substances.

Lithium, silicon, and vinyl are the hazardous substances with the largest mass relative to the mass of solar products. Table 8.1 (adapted from Kishore and Monika 2010) shows the hazards of various e-waste components including the printed circuit boards, semi-conductors, and Lithium-ion batteries present in solar lanterns and home systems. When components containing these substances break down in nature, the substances can be absorbed by the soil or seep into groundwater causing localised toxicity. There is already evidence from some countries that when solar products break down, people throw them in latrines or in the fields.

Cadmium, an important component of thin film cells, has been considered carcinogenic in dust and vapour form by National Institute of Occupational Safety and Health (NIOSH), USA (Aman et al. 2015). Its high build-up can lead to 'chlorosis
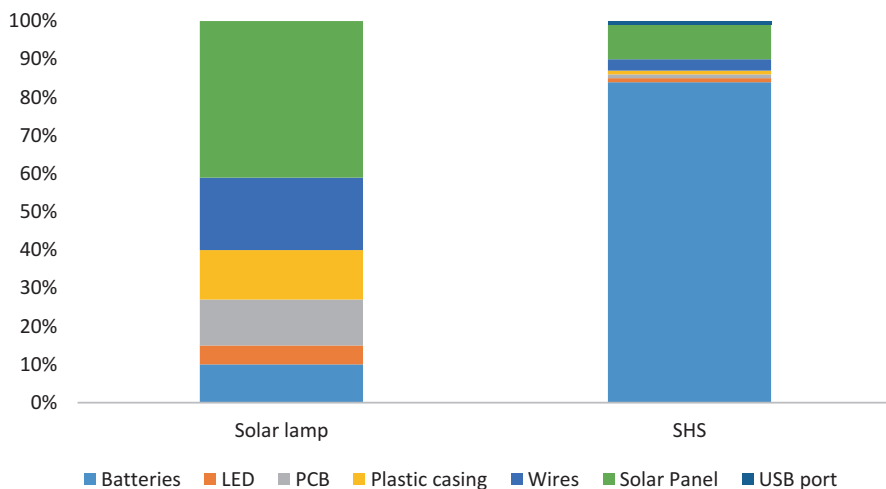
Fig. 8.1 Component composition of solar lamps and solar home system (Data source: Authors' analysis of various solar products available in the off-grid market)

Table 8.1 e-waste sources similar to components of solar lamps and home systems (source: Kishore and Monika 2010)

E-waste sources	Constituents	Health effects
Solder in printed circuit boards, glass panels, and gaskets in computer monitors	Lead	Damage to central and peripheral nervous systems, blood systems, and kidney damage
		Adverse effects on brain development of children; causes damage to the circulatory system and kidney
Chip resistors and semi-conductors	Cadmium	Toxic irreversible effects on human health
		Accumulates in kidney and liver
		Causes neural damage
Relays and switches, and printed circuit boards	Mercury	Chronic damage to the brain
		Respiratory and skin disorders due to bioaccumulation in fishes
Galvanised steel plates and decorator or hardener for steel housing	Chromium	Causes bronchitis
Cabling and computer housing	Plastics and PVC	Burning produces dioxin that causes reproductive and developmental problems
Electronic equipment and circuit boards	Brominated flame-retardants	Disrupt endocrine system functions
Front panels of CRTs	Barium, phosphorus, and heavy metals	Cause muscle weakness and damage to heart, liver, and spleen
Copper wires, printed circuit board tracks	Copper	Stomach cramps, nausea, liver damage, or Wilson's disease
Nickel-cadmium rechargeable batteries	Nickel	Allergy of the skin to nickel results in dermatitis while allergy of the lung to nickel results in asthma
Lithium-ion battery	Lithium	Lithium can pass into breast milk and may harm a nursing baby
		Inhalation of the substance may cause lung oedema

in plants, and necrosis, toxicity, or death in animals' (Malandrino et al. 2017: 7). For humans, severe intoxication can cause 'pulmonary emphysema, kidney dysfunction, and damage to the skeletal apparatus', and long-lasting exposure can lead to 'damage to the peripheral paresis, and central nervous system, as well as to the cardiovascular system, the endocrine system, kidneys' (Malandrino et al. 2017: 7). On the other hand, excessive lead exposure from waste batteries can result in a reduction of immunity. Moreover, due to its biodegradable characteristic, lead persists in the human food chain (Qi and Zhang 2017). Lithium from batteries can also seep into soil and groundwater and be detrimental to human health and the

environment (Jha et al. 2013). Lithium-ion is one of the biggest components of the solar waste stream and will increase further as Li-ion batteries become more common.

8.3.2   How Much of This Can We Expect in South Asia?

Solar products from two prominent solar lamp manufacturers, Panasonic and Azuri, have an average life span of 2 years.[2] As GOGLA (2018) points out, many products last longer than this period. At the same time, research reveals that many products break down before 2 years (Kumar 2015; Turner 2016). This may result from technical failures or socio-environmental circumstances including user behaviour and the lack of repair infrastructures.

The sales data shown in Fig. 8.2 are averages of the global sales data from 2016, 2017, and 2018 reports from Global Off-Grid Lighting Association (GOGLA 2018) and Lighting Global (Dalberg Advisors and Lighting Global 2018). According to Lighting Global, 30% of global sales in 2018 were in South Asia (Dalberg Advisors and Lighting Global 2018). We have used this 30% figure to determine the sales figures for South Asia. From 2011 to 2017, actual sales data show linear increases, but the rate of growth is surprising. Sales totalled $4 million in 2017 com-
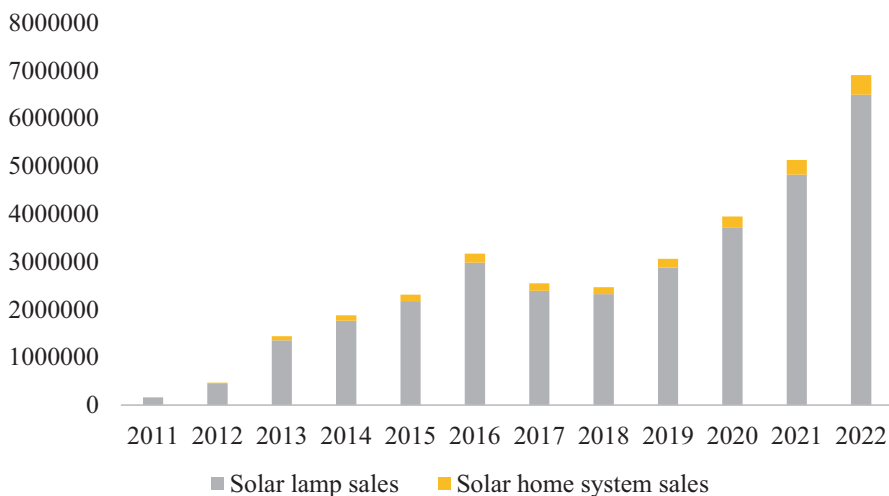
Fig. 8.2 Historical and predicted annual sales of small solar in South Asia. The sales figures up to 2017 are actual figures from GOGLA, and the figures from 2018 to 2022 are projections from Lighting Global (Dalberg Advisors and Lighting Global 2018; GOLGA 2018)

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[2] For its impact analysis, GOGLA assumes an average lifetime of 1.5 times the warranty period. Most solar lamps carry a 1-year warranty.

pare to approximately \$500,000 in 2011. This attests to the massive spread of solar in this period. The period from 2018 to 2022 represents the projected sales of solar products (Dalberg Advisors and Lighting Global 2018). During 2017-18, an acceleration in national grid electrification in South Asia led to the downward curve in Fig. 8.2. However, global discourses of sustainability will become more critical in the long term and more people will transition to sustainable energy, securing long-term e-waste challenges (Byrne and Mbeva 2017). Companies might replace decentralised solar with centralised solar energy creating another type of wastes instead of small solar waste, for example (UN ESCAP 2014). The sales figures also show a dominance of solar lamps. However, SHSs are becoming more popular and are expected to overtake solar lamp sales. Taken together, the sales figures and an average life span of 2 years gives us a sense of the extent of the waste of different kinds that we can expect in the coming years.

Framing solar waste as a matter of pollution and hazard highlights in particular two areas where further research is needed. Firstly, there is a need to access the continued sustainability of solar technology, taking into account its material afterlife. A focus on the toxic contents of solar panels and their balance of system encourages questions of how potential socio-environmental consequences at end-of-life impact the overall sustainability credentials of the technology. Secondly, there is a concern about where the toxicity becomes a hazard and for whom. There is a need for further studies of emerging solar waste economies to better understand who is at risk.

8.4 Solar Waste as Resource and Commodity

Having looked at solar waste as an environmental and health hazard and having achieved a sense of the quantity of waste we could expect in the coming years, we now turn to the second matter of concern in relation to solar waste, namely, its potential role as a resource and as a commodity in the global trade with e-waste. In terms of its constituent parts, solar waste contains many of the same materials as other kinds of electronic waste. This places end-of-life solar devices within existing global e-waste infrastructures and frameworks of governance. Yet although a large part of the challenge of e-waste management has to do with avoiding negative impacts of the global movement of hazardous wastes, as regulated by the Basel Convention, e-waste is not just about hazard, but also about economic value.

Where the framing of solar waste as a source of hazardous *pollution* above invited questions around the quantity and health impact of future solar waste with related ethics concerns about what kind of damage solar waste may cause for whom, a framing that focuses on the potential value to be extracted from solar waste is different. Considering the future role of solar waste in global e-waste markets invites different questions and different ethical concerns about the distribution of costs and benefits in the handling of solar waste, for example. Many of the materials from solar products can be recovered. As an illustration, the recovery percentages reported

for glass and aluminium are 97% and 100%, respectively; for copper and tellurium, the figures are about 80%; and for significantly valued rare metals like indium and gallium, they are 75% and 99%, respectively (although the rare metals are only about 1% by weight of the solar panels) (Malandrino et al. 2017).

Looking at end-of-life solar products as a potential source of revenue invites engagement with a body of literature that in recent years has been investigating the geography of the global trade in e-waste and waste more generally. Here, waste is less about pollution and more about the process and politics through which objects and materials are turned into something else, generating markets and employment in the process (Alexander and Reno 2012; Gregson and Crang 2015; Lepawsky 2018). Two things, in particular, are important to take from this literature. Firstly, e-waste is an important secondary resource for developing countries and an area of significant economic activity and politics (Gregson and Crang 2015), which is complex and very difficult to trace. The geography of the global trade in electronic discards no longer reflects the assumption, which to a large extent underpins international regulations (the Basel Convention), that rich countries in the West are dumping waste on poor countries in the South. Instead, e-waste appears highly regionalised with intra-regional trade accounting for the majority of total trade flows (Lepawsky and McNabb 2010; Lepawsky 2015). Such localisation and regionalisation will be even more evident in off-grid solar waste as the bulk of off-grid solar is sold, used, and discarded in the global South. In this regard, the literature shows that waste and the transformation of it is an economically productive enterprise and a dynamic social and cultural category.

Secondly, the notion of 'waste' is problematic. Current definitions of e-waste frequently do not distinguish between working, repairable equipment (the majority) and materials for recycling. The question of whether an electronic device is waste or non-waste (which can be reused or repaired), hazardous or non-hazardous, is controversial both because it determines which technical pathway the device will take and because it determines which marketplaces it is allowed to enter (Lepawsky 2018). Focusing then on what is being traded rather than how much it weighs shows that the majority of traded e-waste is not actually waste, but repairable electronic devices which are reused, repaired, and sold in second-hand markets (Lepawsky 2018). In the case of solar waste, much of this is already happening within existing repair infrastructures (Cross and Murray 2018).

So, where do off-grid solar systems go when they are no longer in use? According to the literature on consumer waste, they might well stay where they are, at least to begin with. A great deal of domestic electronic and other devices which are no longer in use do not 'go' anywhere, but remain in people's houses stowed away in drawers or on top of cupboards for considerable time before they enter the complex systems of second-hand markets moving up and down different waste hierarchies, for instance (Gregson et al. 2009, 2010, 2013). The extent to which solar-powered devices enter formal and informal repair economies and how well they fare there is insufficiently understood (Cross and Murray 2018). A recent survey of seven countries in Sub-Saharan Africa showed evidence of used batteries from LED lamps being dumped in latrines or in agricultural fields (Bensch et al. 2017), and a large

proportion of electronic waste is assumed to be discarded along with general waste. What is clear, in other words, is even with better sales data from solar distributors, estimates of future volumes of solar waste and assumptions about if and *when* they may make their way into recycling commodity pathways are difficult to make.

Qualitative data collected at a visit to the Waste Electrical and Electronic Equipment (WEEE) Centre in Nairobi in December 2018 illustrate how some of the complexities of how e-waste is framed and valued impact on the businesses and people for whom solar waste and other e-waste represent a livelihood. The WEEE Centre receives e-waste from all over Africa, yet the difficulty with off-grid solar waste is its decentralised nature. End-of-life devices, as they are currently handled, do not represent enough financial value for the WEEE Centre to be able to finance their collection or to provide any financial incentive for people to bring them to the centre. The solar waste that does arrive at the centre (which in quantity is roughly a lorry full every week) arrives from Kenya and neighbouring countries due to an arrangement the WEEE Centre has with some of the major solar distribution companies in Africa. These companies rely on the WEEE Centre for disposal of old technologies that have been made redundant by technological advancements or have been collected by the distributor due to technical failure. Regulation and reinforcement of producer responsibility in this area is still weak, however, and a great number of distribution companies operating in Kenya and more widely in Africa do not organise such collections.

The solar waste that does arrive at the WEEE Centre is sent there for disposal rather than refurbishment and is handled much in the same way as old computers, mobile phones, and other types of e-waste. Yet devices that are deemed functioning or repairable (e.g. second-hand computers which have been shipped from western countries) are repaired and refurbished. The WEEE Centre operates a 'Computers for Schools' programme through which these are then sent out to schools across Kenya, for instance. Devices and other e-waste, which are deemed beyond repair, are weighed and documented before being split apart into plastics, iron/steel, and glass, which are all recycled locally and regionally. Components classed as hazardous wastes, including circuit boards, batteries, and other parts containing (valuable) rare earth metals, are sent on to the EU (primarily to Belgium and the Netherlands) for further processing in accordance with international regulations as the WEEE Centre does not currently have the required capacity to be allowed to process it themselves. Although the staff at the WEEE Centre appreciate that international regulation such as the Basel Convention is necessary to govern the global movement of hazardous waste, they note that the framing of e-waste as a matter of pollution and hazard as opposed to a matter of resource and value has consequences for their ability to create a viable business model out of resource recovery.

Scale is an important factor when it comes to resource recovery from waste. The assumption at the WEEE Centre is that the quantities of solar waste in Kenya and neighbouring countries are considerably larger than the relatively small amount they are currently receiving and is set to grow over the next few years. Thus, the difficulty for them is not the processing of the waste but acquiring it in the first place. The WEEE Centre is only able to recover solar waste through particular chan-

nels, namely, the solar companies. They are well aware, however, that this does not mean that the waste is not recycled. Informal recycling of e-waste in Sub-Saharan Africa is infamous, but also much more complex than the often sensationalist representation of it in global media. The relationship between formal and informal recyclers is ambiguous; the informal sector presents on the one hand a significant challenge for the formal sector by competing for the same resource, but on the other hand, it provides a living for families living on the margins of society: 'People burn wires to get the copper and they pour the acid from the batteries on the ground to get to the lead. And that is very bad both for them and the environment. But you can't just stop that, it provides an income for many families, so we have to think carefully about this' say staff at the WEEE Centre.

Framing solar waste as a resource and commodity in relation to the global e-waste trade then brings out different sets of concerns, ethics, and potential injustices when opposed to framing it as source of pollution. It also shows how a framing that focuses predominantly on avoiding environmental hazard may have unintended consequences for particular stakeholders. When considering future trades in solar waste, questions of the global distribution of equity and procedural justice become much more prominent. Future research in this area needs to better understand who all the different stakeholders are and how different priorities may have unintended consequences.

8.5   Solar Waste as Lives After

Understanding how end-of-life solar devices may or may not enter different reuse, repair, and recycling economies also requires better insight into what happens in everyday life when solar energy becomes solar waste. The previous section traced the material solar waste as it travelled away from households to places like the WEEE Centre in Nairobi and highlighted a number of ethical questions concerning the related global trade in e-waste. This case study now questions which ethical questions emerge in the spaces left behind beyond the lifetime of solar devices. Challenging the boundaries of energy justice concerns it focuses on the lives after solar waste, what a postcolonial ethics approach outlined above would conceptualise as its social ruins, the ruins that are people and their lives, lifestyles, and livelihoods.

During ethnographic fieldwork in India in 2011–2012,[3] the question of what happens to people's lives when devices such as solar lanterns break down became central to Ankit Kumar's research. Generally speaking, the lives after solar lanterns and micro-grids embarked on one of the two pathways when these systems broke down: those who could afford them went on to buy solar home systems; those who could not struggled to cope with kerosene lamps.

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[3] For more details, see Kumar (2015).

Ankit had just finished interviewing some women in a higher caste farmer household in Bijuriya village. There he met Mr. Ramesh Singh who, although he did not like it, went to charge his mobile phone from the solar plate[4] at a friend's house every day. The village in question did not have electricity from the national grid.

A micro-grid[5] in Bijuriya, which ran for about a year in 2010–2011, led to an increase in the number of mobile phones. People had a stable source of electricity to charge their mobile phones, which otherwise cost INR 5–10 to charge every time (Kumar 2018). However, the micro-grid's breakdown means that now, people have ended up with a significantly higher economic burden of charging phones than they initially anticipated. How do they cope with these leftover cell phones and the now normalised practice of their frequent use?

There are other social ruins too. A few days later, when Ankit visited Mr. Ramesh Singh's home and interviewed his family, they explained that the micro-grid had made them realise the importance of electric lights and that they had got 'used to' studying and working under them. Entrepreneurs renting solar lamps in villages played on such dependencies, using tactics like giving people solar lamps free for the first week or so, to 'reel them in'. Once people got used to 'better' lights, they stayed on and paid for the lamps.

After becoming 'used to' better lights due to the micro-grid and solar lamps, people find it difficult to work under kerosene lights. Morris (2011: 316) notes that due to their high dependence on vision, humans have a hard time in conditions of low light. Connected to this, like most other people in Bijuriya, Mr. Singh's son explained that the disadvantage of vision under lower illumination is accentuated further when one becomes 'used to' electric lights and then has to go back to kerosene lanterns. He compares it to the struggles of poverty after getting used to a life of wealth.[6] In short, problems associated with lack of electricity—'better' lights and mobile charging—are exacerbated when people are forced to readapt to a lack of electricity. How do people cope with the absence of these better lights that now they have become so used to?

We raise this question in the light of our earlier discussion on the ethics of ruins and renewal. Waste as material resource has an afterlife of renewal. Waste as material hazard has an afterlife of ruin, ruining nature and human health. What happens to this particular form of ruin: to the lives after solar? What happens to the new mobile phones, their users, and the now socially embedded practice of using mobile phones? What happens to people who now find it difficult to see in the light of old kerosene lamps? Are these social ruins also going through a process of renewal? If they are, what new material and social costs are involved? In short, how do people manage their *lives after* solar? The current energy justice paradigm does not answer these questions, yet here we show that these questions are central to lives of solar devices and lives of people who engage with these devices.

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[4] Local name for solar home system.

[5] This was a biomass-based micro-grid, but the everyday experiences of energy users are same regardless of the source of energy generation.

[6] This logic works very well for energy access project that promises to eradicate energy poverty.
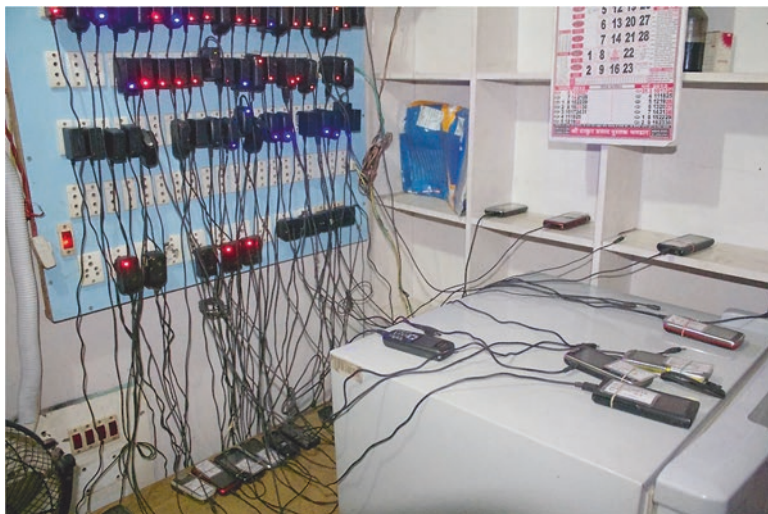
Fig. 8.3 Mr. Gupta's mobile phone charging shop in Hardiya village. People get their phones charged for INR 5–10. Many people own smart phones and use them to watch films and listen to music, which runs the batteries out faster. Because of this, many people have to get their phones changed more than once a day. This creates a substantial economic burden

8.5.1 Living with Ruins

People who now own new mobile phones in Bijuriya either: (1) renew their old practice of visiting shops like Mr. Gupta's (as shown in Fig. 8.3) to charge their phones at a high price or, (2) like Mr. Singh, tap into their social network. Where solar networks end, the social networks that existed before solar take over. One can question why this matter at all as even before the micro-grid arrived in the village people had to rely on the commercial mobile charging shops or their own social networks to charge phone. Indeed, this burden existed even before the micro-grid. However, now the burden is bigger. The micro-grid catalysed the purchase of mobile phone, and now most homes own multiple phones. There are more phones to be charged, more money needs to be spent at charging shops, wider social network needs to be tapped into, and more frequent embarrassment needs to be faced with.

Depending on social networks also means that people need to find others within their own social groups to charge their phones. Those who cannot must pay for the expensive charging facilities. In addition, due to their limited mobility in this cultural setting, women often have to depend on male members of the household to charge their phones. With the micro-grid, they could charge their phones by themselves inside their homes.[7]

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[7]This is certainly true in case of Mr. Singh. He had actually come to charge his wife's mobile phone when Ankit met him.

8.5.2 Ruins to Renewal

For others, lives after solar consist of more solar. Mr. Rajendra, another farmer in Bijuriya informed Ankit that when faced with the new problems of coping with an absence of better lights that villagers had become used to and a lack of cost-effective solutions for charging mobile phones, people began looking for alternatives. He explained that before electric lights arrived in the village, they were used to (*abhiyast*) kerosene lights but that going back to kerosene was now impossible. For this reason, he bought new solar plate and installed lights around his home. He also runs a small TV and fan from this solar plate.

Mr. Rajendra made an important argument. 'Getting used' to electric lights has forced the people in Bijuriya to look for other solutions. Most people in Bijuriya reported that solar plate numbers increased substantially since the arrival and the subsequent shutdown of the micro-grid. This is partly driven by the need for a cost-effective solution to charging mobile phones. Thus, solar plays a central role in the lives after. It is easily available and can be readily used. However, this does not solve the problem of material waste; rather, it exacerbates it. Further, not going back was not possible for everyone. Some, including Mr. Singh, could not afford to buy a solar plate. His son had to go back to studying under kerosene lamps, however difficult that might be. Mr. Singh had to go back to frequenting his friend's house to charge mobile phones, however embarrassing that might be.

The two pathways that lives after solar open up bring us back to the earlier two sections on waste. In one pathway, the material (left over mobile phones) and social (being used to better lights) lives and lifestyles solar created threatened to go waste or become hazardous to people by creating new economic burdens. In the second pathway, people take a step forward and buy new solar plates. These lives after then become resources for selling new solar, meaning that solar companies inevitably benefit. As discussed in Sect. 4, resources are for some and hazard for others.

Approaching solar waste through a postcolonial lens enables this line of questioning which does not 'follow the waste' as such but considers the effect the process of bringing electricity to people by means of solar entails and the often unintended consequences this has on the ground (Turner 2019). It questions the wider effect of the empire (Stoler 2008) and the frequent disconnect between the promise of infrastructure, to bring modernity, development, progress, and a better life, and what is actually delivered (Anand et al. 2018). A consideration of lives after as opposed to afterlives in other words forces an ethical position which prevents the socio-cultural effects such 'broken promises' have from being seen as externalities.

8.6 Conclusions and Comparative Reflections

Solar waste is a growing problem, but it is not the same kind of problem everywhere and for everyone. As efforts to estimate the future quantity of solar waste are underway, this chapter has considered how multiple framings of solar waste may lead to

complementary questions about who and what solar waste will come to impact in the future as its volumes grow. Until recently, the question of energy access was disconnected from the issue of waste. The literature on off-grid solar has only recently begun to touch on the question of solar waste, and this chapter furthers this cause. It follows that there is a need for further research to understand the relationship between the socio-material transitions of securing energy access and the types of waste and afterlife they encompass.

Connecting questions around energy and waste challenges the boundaries of energy justice with its dominant focus on systems of production and consumption, by emphasising that consumption is not the end of the story. Ethical notions of ruins and waste derived from postcolonial studies provide useful conceptual tools for this challenge. In this way, attention to the situated and historical context in which solar waste emerges forces questions of not just how it is (to be) handled, but also what legacy it represents to different people.

This chapter has illustrated how the framing of solar waste has consequences for what socio-material challenges it poses—what sites of injustice we should be concerned about. An emphasis on solar waste as pollution and hazardous material focuses the need for waste management. The dominant concerns here relate to a need to protect people and environments from harm. This chapter has illustrated how this framing, which is dominant in international regulations such as the Basel Convention, has unintended consequences for stakeholders such as the WEEE Centre and both the formal and informal waste economies who handle the waste and make a living from doing that.

A critical challenge for the global regulation of solar waste then is to balance multiple framings, solar waste as hazard and solar waste as resource. As we have seen, an emphasis on solar waste as a resource and a commodity in global value chains involves different stakeholders and raises different concerns about the equitable distribution of risks and benefits across value chains. Understanding how synergies and trade-offs exist between these framings requires further research. Both these concerns are around the *afterlives* of solar energy provision and the material waste this produces and involve 'following the waste' as something which is physically present, material, and tangible. Enrolling a postcolonial perspective, this chapter also pursued a different approach which did not follow the waste but rather recognised the ruins it had left behind.

An emphasis on solar waste as social ruin however is less tangible and relates to an absence of technology or energy materials in spaces where they once were. The concern here is about *lives after*, about the social, cultural, and political *legacy* left behind at the end of the technology lifecycle, when solar energy has become solar waste. A postcolonial lens calls for more situated, historical, and ethical enquiries of how the entire process that produces solar waste impacts many different communities and societies in countries of the Global South. Vinay Gidwani (1992) suggests that we see waste both as a noun and as a verb. 'As a noun it serves as dumping ground for all those entities that modern society views as marginal, residual, unimportant, or unpalatable. As a verb it describes the varieties of human behaviour that are unacceptable to modern society. In either grammatical form, the word 'waste'

hovers in the English language waiting to pounce on subjects and objects at the fringes of society' (Gidwani 1992: 39). In energy justice terms, looking at *lives after* instead of *afterlives* unravels different sites of injustice.

This is the purchase of combining an energy justice perspective with postcolonial analysis: it enables a critical and ethical analysis not only of the lives and afterlives of material energy systems such as off-grid solar PV, but also of the lives after, the people and places affected not merely by the solar technologies but the processes through which they enter and exit their lives, and the promises they make in the places where they are deployed.

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Part III
Applying Theory to Practice in Energy Justice Across Borders

Chapter 9
A Hindu Philosophy Perspective on the Temporal Nature of Energy Justice in Odisha, India

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Abstract This chapter draws upon Amartya Sen's interpretation of the Hindu *Bhagavad Gita* to discuss temporal justice implications underlying energy transitions observed in much of the Global South. In particular, it applies this Hindu-based philosophy to unpack the energy policy dichotomy currently facing policymakers in the Indian state of Odisha: the conflict between achieving sustainable development whilst also rapidly decarbonising by transitioning away from a strong industrialisation-driven model of economic development. Drawing from the *Gita*-inspired notions of a focus on duty in the here-and-now versus a sensitivity towards future consequences of present actions, this chapter introduces *Nyāya*, a Sanskrit term for justice. We argue that *Nyāya's* focus on 'realised' justice is far more comprehensive and inclusive in that it allows policymakers to move beyond *Niti*, which limits, instead, policy to follow the trappings of bounded institutions, rules, and regulations.

9.1 Introduction

Globally, the twin policy priorities—to achieve sustainable development and tackle climate change—represent challenging battle lines to navigate, particularly for policymakers in the Global South. The energy sector embodies this battlefield greater than most, with the need to rapidly decarbonise the energy industry whilst also providing reliable, affordable and modern energy access to the more than three

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billion people who currently remain energy poor (IEA et al. 2018). Yet despite the recognition of attainable synergies, these two energy priorities are often regarded as being separate by policymakers (see, for example, Bhardwaj et al. 2019; Cameron et al. 2016; Malakar et al. 2019; McCollum et al. 2011; Stechow et al. 2016; van Vuuren et al. 2012). In India, an energy policy paradox formed along these battle lines has become particularly apparent. India recognises the need to transition away from its current high dependence on fossil fuels (Oliver et al. 2016) and to avoid potentially significant global climate consequences (IEA 2015; Spencer et al. 2018). Of the World's 20 biggest energy-consuming countries, India's progress in increasing the share of renewables in its final energy consumption was the slowest between 2010 and 2015 (IEA et al. 2018). Meanwhile, 20% of India's total households (approximately 45 million) remain energy poor. Achieving universal access has remained an elusive and challenging goal for Indian policymakers for the past several decades (Dubash et al. 2018, p. 380; Palit and Bandyopadhyay 2017).

For emerging economies such as India, these two energy sector priorities represent an important paradox that local policymakers struggle to navigate in light of numerous political and resource constraints; resources invested to address one priority may impede progress on other pressing needs—whether energy-related or broader development agenda. Given that energy sector investments typically play out on temporal scales measured across decades (Gross et al. 2018; Lund 2006), decisions made by policymakers today will have both intra- and inter-generational consequences. Consistent with other contributions in this volume (see for example, Pellegrini-Masini et al. 2019), we argue that this complexity increases with the presence of divergent stakeholders with their own interests and priorities. In other words, a plurality exists within this energy paradox that is largely built upon a multiplicity of knowledge and expertise and actors and institutions, interacting over time (Delina and Janetos 2018; Delina and Sovacool 2018). This plurality necessitates a framework that allows policymakers to cohesively and simultaneously address the temporality and the dynamic nature of justice implications underlying the energy paradox.

In this chapter, we build upon a temporal energy justice framework (Malakar et al. 2019), inspired by Amartya Sen's interpretation of the Hindu *Bhagavad Gita* (the *Gita*), and apply it to the contemporary case of the Indian state of Odisha. Here, local policymakers are confronted with stakeholder plurality determined by an underlying energy paradox. As one of India's most mineral resource-rich states, Odisha is known for its heavy focus on industry-driven economic development. Yet despite economic and industrial progress in the state, the flow of benefits has remained highly unequally distributed. Rates of rural electrification remain low with 57% of households without electricity[1] (India Census 2011). In Odisha, 42% of households were reportedly below the poverty line in 2016 (International Institute for Population Sciences and ICF 2017). Odisha's Gini coefficient (a proxy measure for economic inequality), whilst slightly better than the all India average (World Bank 2018), has worsened between 1994 and 2012, particularly in urban areas (World Bank 2016). Furthermore,

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[1] We note that India has made significant progress in rural electrification over the last two years. However, despite more than 99% village electrification claimed by the Government of India, robust household level data for Odisha remains unverified at time of writing.

Variables	India	Odisha
Lack of electricity access (% of households) in 2011	33	57
Coal production (Million tonnes in 2016-17) (%)	662.79 (100%)	139.38 (21.03%)
CO_2 emissions per capita (tonnes) in 2011	1.5	3.65
Gini coefficient in 2012	0.35	0.28
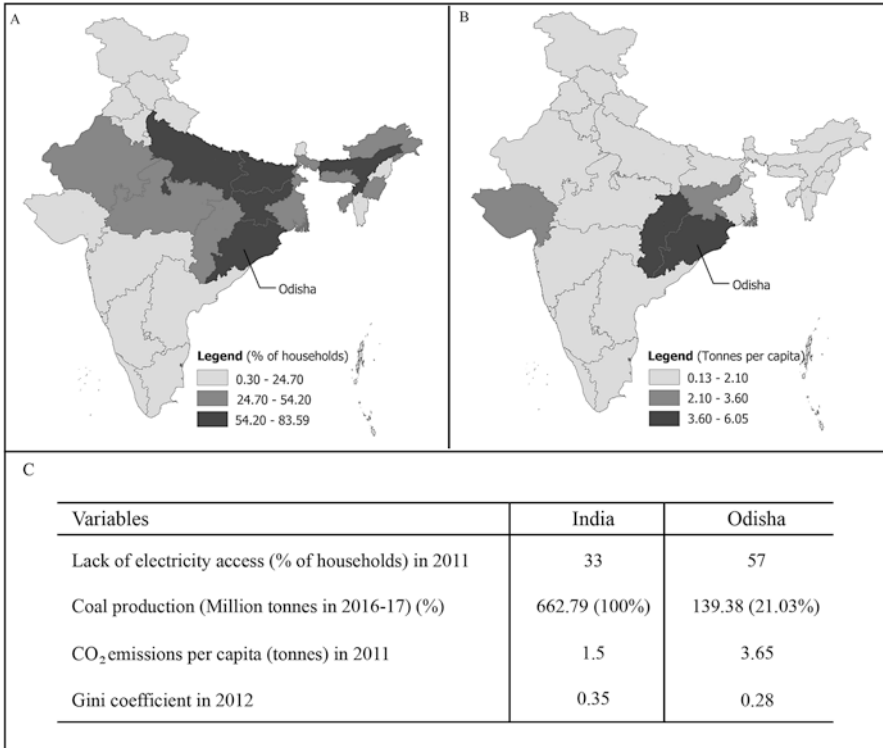
Fig. 9.1 (**a**) Electricity access by India State (data obtained from Government of India 2011), (**b**) CO_2 emissions by India State, excluding land use (data obtained from Ananthakumar et al. 2017), (**c**) comparison between Odisha and whole India, various measures (data obtained from Government of India 2018; World Bank 2018)

with intense coal mining and a suite of large-scale heavy industry dependent on thermal power operating in the state, Odisha remains India's second largest carbon emitter of all 29 states (Ananthakumar et al. 2017) (see Fig. 9.1).

Odisha represents a relevant case to develop this temporal justice framework, particularly as 94% of its population is of the Hindu faith (Government of India 2011). By extension, we hope that a framing of temporal justice, using the teachings of the Hindu *Gita*, may resonate both culturally and philosophically with local policy makers.

We proceed in three steps. First, we briefly outline a framework, grounded in the *Gita*, to navigate plurality and the temporal nature of energy justice implications. Next, in Sects. 9.3 and 9.4, respectively, we outline and interpret what we see emerging in the power sector in Odisha, indicating a strong emphasis towards duty with limited consideration of the future consequences of present-day policy decisions. Finally, we expand and draw on the justice-related concept of *Nyāya*, a Sanskrit term from Buddhist and Hindu philosophy, to identify a path forward that can support local policymakers to address the multiplicity of objectives, stakeholders and interests. A *Nyāya* framing, through its focus on realised justice, will allow energy policy to be more comprehensive and more inclusive.

9.2   Navigating the Temporal Nature of Energy Justice: A Hindu Lens

From theoretical and applied standpoints, the twin energy priorities discussed above highlight important questions of ethics and justice. First, the global climate imperative to facilitate the rapid decarbonisation agreed upon as the Paris Agreement in 2015 highlights the responsibility of all governments to participate as global citizens.[2] The Agreement reiterates that the variability across regional and local adaptive capacities towards ongoing climate-related impacts is a result of a number of past and present, context-dependent factors. The latest IPCC report (IPCC 2018) also indicates that the uneven distribution of climate change impacts will likely lead to particularly harsh consequences on disadvantaged and vulnerable populations, including those in India who, generally speaking, are already subjected to global structural inequalities.

Second, the strong political and social imperative to deliver critical services to the energy impoverished is founded upon principles of ethics, morality and justice. The lack of access to even the most basic of energy services, such as a reliable electricity connection or a supply of modern, clean cooking fuels, is already established as having diverse and profound repercussions on people's opportunities and their capabilities to pursue a quality life (Day et al. 2016).

Energy justice is an emerging framework designed to theorise, analyse and navigate energy transitions to enable the just distribution of benefits and burdens that ensue (Jenkins et al. 2016; McCauley 2018; Sovacool et al. 2017). The assessment of injustices and inequalities is critical to identify (1) who is being treated unjustly (recognition), (2) where they are located (distributional) and (3) why they are not being recognised in the decisions that affect their lives (procedural). Answers to these questions provide a foundation to establish just energy systems that not only address present energy needs but also take account of future consequences of current energy decisions.

A recent contribution to the energy justice literature expanded the notion temporally to argue the inclusion of inter-generational concerns with respect to energy transitions (Malakar et al. 2019). Importantly, this temporal energy justice framework draws upon a non-Western philosophy, namely, Sen's interpretation of the *Gita*, to analyse and formulate energy policy decisions based on two time-based notions of justice: 'duty-focused' and 'consequence-sensitive'.

The *Gita* is a part of an epic Hindu tale, the *Mahabharata*. It is set in a great battle for the kingdom of *Kurukshetra*, raged between the *Pandavas* and the

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[2] Recognising, of course, the principle of common but differentiated responsibilities and that parties to the Agreement vary widely in their responsibility for climate change, thus raising pertinent questions regarding their obligation to and role in undertaking climate mitigation beyond what is rationally commensurate. Although not all governments are signatories to the Paris Agreement, the 197 members of the UNFCCC who have signed or acceded represent more than 88% of global greenhouse gas emissions.

Kauravas; the former are the rightful proprietors of the kingdom, whereas the latter (which includes members of the extended *Pandavas* family) have wrongfully taken control of the kingdom. The *Gita* describes a dialogue between *Arjuna*, the commanding general of *Pandavas*, and his charioteer Lord Krishna, as they ride out to battle. In the dialogue, *Arjuna* shares his concerns to Krishna regarding the consequences of the battle he must lead and the ensuing social, moral and emotional destruction. *Arjuna* foresees an inevitable personal guilt from those consequences and questions whether he should proceed to battle. Lord Krishna advises him to do his *karma*, or duty, irrespective of the potential consequences. Krishna reminds *Arjuna* of his duty, as a born warrior, to win against the (evil) *Kauravas* and do justice to his people, the rightful rulers of the kingdom.

Sen draws two time-based notions—'duty-focused' and 'consequence-sensitive'—from the dialogue in this tale. Sen interprets that *Arjuna* legitimately expresses sensitivity towards consequences of his actions, whereas Krishna is concerned only with duty. Developed from the text of the Gita, Sen argues for the integration of a consequence-sensitive lens in present-day actions and political thinking to minimise, if not avoid, the future injustices that may ensue.

To contextualise, a duty-focused energy policy direction would entail actions that primarily address observable present-day challenges, such as to expand energy supply for economic advantage and/or to provide access to the energy impoverished. The extreme version of this duty-focused position would act to achieve these objectives using any means necessary—i.e. ignoring the consequences of these energy investments (conceivably of a fossil-fuel-based nature). A consequence-sensitive policy pathway, on the other hand, promotes energy decisions in the present that are sensitive to the consequences, both immediately and in the future. An extreme consequence-sensitive position may argue against any current energy interventions driven on fossil fuels, as they may lead to severe medium- to long-term consequences on the climate, thus making it dangerous for future generations.

To move beyond this seemingly conflicting temporal dichotomy, we introduce the concept of 'Nyāya', which allows the expansion and consideration of substantive freedoms in both the present and the future (Sen 2009). *Nyāya* comprises realised justice beyond institutional rules, roles and policies. Sen writes, '[t]he realization of justice in the sense of *Nyāya* is not just a matter of judging institutions and rules, but of judging the societies themselves' (p. 20). For Rao (2015, p. 122), *Nyāya* 'entails a broader, more substantive focus on the world that emerges from the institutions we create, and it is central to creating a sustainable and just society'.

Due to the 'multi-dimensional' nature of energy transitions (Stirling 2014), policymakers need to step outside their institutional boundaries, integrate multiple disciplines and collaborate with diverse stakeholders (Delina and Sovacool 2018). The concept of *Nyāya* justifies and promotes processes to achieve this. We now attempt to unpack what it means to take a *Nyāya* account of justice, leveraging the unique case of Odisha's energy paradox to draw out practical recommendations for its policymakers to advance a just energy transition.

9.3 Current Policy Landscape of the Power Sector in Odisha

Within India, Odisha provides a unique context to explore energy justice implications. It has historically remained one of India's most disadvantaged states both in relation to absolute and multidimensional poverty (UNDP 2011). Odisha's per capita gross state domestic product stands at the fourth lowest of all major Indian states (Government of India 2011; UNDP 2011). As one of India's key resource-rich states, Odisha has focused heavily on industrialisation through mineral wealth accumulation (Kale 2014) and in doing so has inadvertently diminished the share of agriculture and other rural economies in the state's gross domestic product (Das and Nayak 2018; Nayak et al. 2016). As an example, income from mining royalties doubled in 5 years between 2000 and 2005, constituting up to 65% of the total earnings for the state (Dash 2007; Spencer et al. 2018). Through its combined extractive and productive industry focus however, Odisha has lately emerged as one of the most favoured investment destinations for producers of aluminium, iron and steel, both for local and international use (India Brand Equity Foundation 2018).

From a power sector perspective, Odisha was the first state nationally as well as across South Asia to undertake an exhaustive power sector reform in the early 1990s. This resulted in the restructuring of the state's primary utility, the Orissa State Electricity Board (OSEB), the privatisation of thermal generation and distribution entities and a substantial tariff reform. The power reform was essentially triggered by a suite of factors, ranging from poor performance of the OSEB, the lack of a substantive agricultural lobby in the state (Thillai Rajan 2000), changes to the World Bank lending conditions for power sector development at the time, the state government's limited capacity to raise finance for a much-needed 600 megawatt (MW) hydroelectric project in the early 1990s and, consequently, efforts to 'restore the finances of a debt-trapped government' (Das and Nayak 2018: 195).

The results of this reform process have remained mixed with regard to achieving a more efficient power structure in Odisha or in substantially improving rates of state-wide energy access. As an outcome of its reform process, OSEB withdrew all subsidy support to the power sector, including the distribution companies, which were completely privately owned by 1999. On the one hand, this action critically disengaged potential investors, undermining the original purpose for power restructuring, whilst on the other hand, leading to a sharp rise in tariffs. This further compounded inequities in electricity access owing largely to poor affordability. Moreover, it brought forth a suite of bills collection and management challenges for the distribution businesses (Das and Nayak 2018).

Even after power and electrification were recognised to play a significant role in the state's potential development, a steadfast focus on industrial advancement historically left little political attention towards rural electrification. As a region, Odisha has maintained an ongoing tussle between its industrial and rural priorities where a lack of attention towards the latter has pushed rural communities to a further disadvantage. In a 2001 review of Odisha's power sector reform, it became clear that 'rural electrification was the worst casualty [of power sector reform] …

and agricultural pumping [i.e. irrigation] by use of electricity remained grossly neglected' (Das 2016b: 194). The situation only began to change seriously with the push for rural electrification in 2007. The emergence of renewable alternatives, and their access to high-paying customers (such as policy to support the uptake of solar rooftops in the state's two largest urban centres), poses another contentious justice-related challenge for Odisha's power sector utilities (Das and Nayak 2018).

Despite this reform—and as some even suggest, perhaps because of this—Odisha's energy accessibility rates and the pace of electrification remain one of the slowest of all mainland states in India (Das 2016a; Kale 2014). The situation is even worse in relation to the availability of clean cooking energy; of India's six largest states, Odisha ranks the second worst in access to clean cooking energy, with less than 10% of all households currently using LPG (UNDP 2011). Table 9.1 shows a comparison of how Odisha fares vis-à-vis the national average on energy poverty.

In terms of the current breakdown of Odisha's power sector, the state has a total installed capacity of 7378 MW (Central Electricity Authority 2018). Just under 5000 MW (68%) of this capacity is coal-fired thermal power generation, whilst 29% comes from hydropower. Only a small 3% (233 MW) share of current installed generation capacity comes from other renewable energy sources, including small hydro, biomass, solar and wind. Odisha is not only one of India's top ten states reliant on coal-fired power generation, but its 2011 carbon footprint of 3.65 tonnes of carbon emissions per capita (tCO_2-e) was more than twice the all-India average of 1.5 tCO_2-e (Central Electricity Authority 2018).

Looking forward, the state government's plan for the future of the energy sector is largely summarised in two primary policy documents. The Odisha Renewable Energy Policy (2016–2022) outlines their vision to encourage additional renewable capacity of up to 2750 MW by 2022 including solar (2200 MW), wind (200 MW), small hydro (150 MW), biomass and other renewables (200 MW) (Central Electricity Authority 2016; Government of Odisha 2016). The policy's three focal areas align with the national renewable energy guidelines in that they promote (1) state's energy security and commitment to carbon emissions reduction, (2) investment in renewable energy markets as well as manufacturing and R&D and (3) private sector

Table 9.1 Comparing energy poverty between Odisha and India (Government of India 2011; UNDP 2011)

	Total no. of households (% of national share)	% electrified	% with no lighting	% using solid fuels for cooking	% using LPG for cooking
India	246,740,228	67	0.5	67.4	28.6
Rural	167,874,291	55.3	0.5	86.4	11.4
Urban	78,865,937	92.7	0.3	26.1	65
Odisha	9,661,085 (3.9%)	43	1.1[a]	86.2	9.8
Rural	8,144,012 (4.8%)	35.6	1.1	93.8	3.0
Urban	1,517,073 (1.9%)	83.1	1.2[b]	45.3	46.1

[a]Third highest nationally
[b]Largest percentage of all 34 States and Union Territories

participation in renewable energy projects to seek a greater share of green energy within the state's overall installed capacity.

The second primary instrument indicative of the energy policy intentions of the Odisha government is the *24x7 Power for All*, a joint initiative between the Government of Odisha and the Government of India (Government of Odisha and Government of India 2016). This document offers a more inclusive perspective on the energy sector, placing the state's renewable energy ambition within the wider context of national energy sector expectations. The objectives for the power sector, according to this policy instrument, are to connect the remaining unelectrified domestic, commercial and industrial customers by 2019, whilst ensuring reliability (24 × 7) and affordability of supply. To achieve these objectives, the *24×7 Power for All* analysis anticipates energy demand would increase from 3900 MW in 2015 to approx. 5300 MW in 2019, requiring a 64% increase in installed capacity over the same period to cater to the rising demand. Importantly, the forecast anticipates less than 10% of this additional capacity to come from renewable energy sources, with the vast majority expected to come from thermal (coal-fired) generation.

9.4 *Upamāṇa* (Comparison): Evaluating Justice Implications of Divergent Energy Policy Pathways for Odisha

Despite being one of the more resource-rich states in India, the benefits from Odisha's industry-led economic development have been far from equitably distributed, as demonstrated by the region's deteriorating Gini score. Similarly, transitions in the energy sector have led to substantive inequalities. Here, we further examine Odisha's current energy policy position and consider divergent pathways and possibilities that policymakers must contend with moving forward. To that end, we draw upon the temporal energy justice framework outlined earlier and in particular on Sen's use of the analogous *Gita*, to compare and contrast a focus on duty with a focus on sensitivity towards consequences and to consider the underlying justice implications of divergent energy policy pathways.[3]

Although Sen departs slightly from early Hindu philosophers[4] in his articulation of *Nyāya*, he usefully carries forward the idea of *Upamāṇa* (Sanskrit for 'comparison'), a core characteristic of the traditional *Nyāya* philosophy. To emphasise the position of *Nyāya*, Sen dismisses the idea of seeking the perfectly just society. Instead, he argues for identifying comparative and feasible alternatives and for

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[3] Sen acknowledges that the extremes he uses with respect to these positions (i.e. a pure deontology/duty focus or an exaggerated concern for consequence leading to inaction) remain analogous and may not be representations of the real world, but nevertheless are useful to contemplate for the purpose of theory development.

[4] See, for example, Gotama (1974), who refer to *Nyāya* as a distinct epistemology, a systematic process of logic development and reasoning.

making an informed choice among them, whilst accepting that necessary trade-offs at times may be required. *Upamāṇa*, as a source of knowledge generally derived from comparison and analogy, serves as a tool in the process of attaining *Nyāya*. Following Sen's argument and the *Nyāya* spirit of *Upamāṇa*, we evaluate the inter- and intra-generational justice implications of two broad energy policy positions for Odisha; the first with a primary focus on duty in the here-and-now and the second with embedded sensitivity towards the consequences of present day actions and decisions.

9.4.1 A Focus on Duty: Industrial and Economic Development

Odisha's historical focus on exploiting its mineral and resource wealth can be analogous to a focus on duty; a clear focus on the here-and-now, to take advantage of the state's rich endowment. At the risk of over-simplifying the moral argument for this position, the assumption underpinning this deeply entrenched policy push in Odisha is that economic returns from industrialisation are for the benefit of all citizens of the state. This is achieved, for example, through job creation, improved infrastructure and royalties to boost state revenues which, in turn, will provide for social services such as education and health. Lord Krishna uses a similar position to implore Arjuna in the *Gita*, reminding him of his duty as a born warrior to go to war and fight for the side of the righteous.

As this strategy plays out for Odisha, the energy sector is developed to support the state's insatiable urge to encourage mining and industrial activity. The outcome observed for Odisha is an increase in installed power capacity predominantly fuelled by coal, which has incentivised greater industrial activity, whilst the revenue from industrial expansion has done little to promote citizens' social and economic upward movement.

Odisha's focus on industry-based economic development also intended to develop institutions capable of, through wealth redistribution, delivering a just world. Sen clarifies a similar interpretation of justice, in the form of *Nīti*, that encapsulates a focus on organisational propriety, bounded by the rules and roles of institutions. Yet, as it can be seen, wealth redistribution through these institutional mechanisms has largely remained a populist intention, delivering patchy outcomes at best. This regulatory and institution-bounded *Nīti* approach to justice has remained limited in its scope to equitably and meaningfully improve the Odia peoples' capabilities to live a fulfilled life.

For Sen, justice considerations need to be concerned with the actual lives that people live. Here, it can be seen that injustices have played out despite (or perhaps because of) the state's focus on duty. The extraction of resources for economic development has led to a series of negative externalities, degrading—not improving—people's quality of lives. For example, millions of rural (including indigenous, or locally called 'Scheduled Tribal') communities have suffered from decades of exploitation at the hands of their own 'duty-focused' state government machinery

(Mishra and Mishra 2014; Padel and Das 2006). People have suffered displacement, receiving negligible to poor compensation for forced land acquisitions, as well as exploitation by the mine contractors and middle men over the past several decades in Odisha. Whilst this holds true for communities living in the mineral-rich lands of the state, other rural parts of the state have suffered equally, or more. With limited resource endowments, southern regions of the state have been neglected in other ways, primarily through the state's lack of focus on creating a vibrant rural economy (Mishra and Mishra 2014; Mishra 2010).

In contrast to a *Nīti* interpretation of justice, recall that *Nyāya*, on the other hand, stands for a comprehensive account of realised justice. Both *Nīti* and *Nyāya* are Sanskrit terms for 'justice' yet diverge considerably in their interpretation. For Sen, as important as rules, regulations and the roles of institutions are, these need to be considered within the broader and more inclusive perspective of *Nyāya*, whereby the focus and consideration are importantly placed on the world that actually emerges. As Sen writes, 'we can never hand over the task of justice to some Nīti' (2009: 86).

9.4.2 A Sensitivity Towards Consequences: Transition to a Just and Sustainable Energy Sector

Without careful consideration of the consequences that ensue, Odisha's focus on economic and industrial development over-emphasises the here-and-now and remains largely blind to energy injustices of an inter-generational nature. For *Arjuna*, it was this sensitivity towards consequences that made him purposefully deliberate on whether to proceed to battle. In his deliberations, *Arjuna* considers not only past events and existing rules and norms to help guide a just course of action. He also considers what will actually happen in the world; in other words, the outcome from his actions (in this case, the decision to proceed to battle)—i.e. the killing that will be required, the severe fracturing of society and unravelling of the fabric that binds all members of one family together.

When considering Odisha's energy sector development over the past two decades, several important consequential outcomes are worth noting from a justice perspective. First, that benefits from energy sector development remain unequally distributed. Despite the increase in installed power capacity and Odisha being a largely power-surplus state, its institutions and processes have remained simply incapable of meeting the needs of the poor and maintaining the power sector's financial viability, as demonstrated by its high share of energy poor households and an expanding debt crisis. In other words, the consequence of Odisha's past and present larger focus on adding supply capacity for industrial customers, rather than expanding distribution infrastructure, has made energy access unaffordable and inaccessible, thus also limiting the prospects of sustainable rural development.

Second, Odisha's energy-led economic development has been predominantly fuelled by increases in coal-fired power generation. Furthermore, despite Odisha's ambitious renewable energy policy that indicates a desire to transition towards a cleaner energy sector, progress on the ground has been far too slow to instil any confidence in the state's ambition to achieve its proposed 2750 MW of renewable energy installed capacity by 2022. A 2016 assessment of renewable energy potential across India suggests Odisha has considerable untapped potential, standing at 27,728 MW, 93% of which is solar (25,780 MW) with a small potential of wind (1384 MW) (Central Electricity Authority 2016). Yet despite this potential, Odisha's slow progress puts it in the fifth lowest position for installed renewable energy capacity of all mainland states in the country (Central Electricity Authority 2016).

Additionally, a consequence-sensitive energy policy platform might reveal other foreseeable concerns, including financial burdens of current decisions. The risk of stranded coal-fired generation assets, particularly in a global climate that calls for rapid decarbonisation, as well as thermal-power-dependent industrial investments, for example, could be tabled and weighed in deliberations (Helm 2002; Sovacool and Scarpaci 2016).

9.5   Discussion: Progressing a Nyāya-Based Policy Direction

An energy policy position sensitive to the consequences of decisions made in the here-and-now inevitably holds justice implications across space and time. After considering, for example, the climate mitigation imperative from a consequence perspective, should policymakers in Odisha divert limited budget resources to rapidly transition from a coal-dependent power sector to renewable energy? Or, would they rather not encourage this transition in fear of what implications it might hold for Odisha's resource-based economy and/or local communities who rely on the sector for employment and livelihoods?

Importantly, a *Nyāya*-based interpretation of justice does not advocate for policymakers to be negligent towards acting, within their means, on their duty to promote a just and equitable society in the present day. Indeed, a persistent and unyielding consideration and concern for the limitless consequences of present actions can be counterproductive and ultimately lead to decision paralysis. A core, defining feature of a *Nyāya* perspective of justice is that it goes beyond the rather parochial understanding of duty as constructed by present day institutions, rules and norms (*Nīti*). Instead, *Nyāya* calls for a deeper focus on realised just outcomes that are cognisant of duty in the here-and-now, without compromising justice and ethics underlying future outcomes.

And so, the question remains, what exactly does a *Nyāya*-based energy policy pathway look like for Odisha? We offer a suite of principles that may better allow a *Nyāya*-based perspective of energy justice. Table 9.2 provides some guidance on foundational principles, acknowledging their relationship with the three tenets of energy justice (Jenkins et al. 2016).

Table 9.2 Principles for a *Nyāya*-based temporal energy justice policy platform

Principle	Description/rationale	Sample relevant literature
Principle 1. Inclusive, wider stakeholder participation in energy decision-making (*Recognition*)	Considerations of justice, from both an intra- and inter-generational perspective requires input from a broad set of stakeholders, including representation from groups who may not have that capacity (e.g. the next generation)	Delina and Janetos (2018), Sareen (2018), Bhattacharyya and Palit (2016)
Principle 2. Systems-based approach and policy integration (*Procedural*)	Policy integration is a critical component of harnessing the synergies and recognising justice-related trade-offs across different subject areas. A systems-based approach can provide a valuable platform to pursue an agenda that fosters policy integration	Hodbod and Adger (2014), Cherp et al. (2018), Sareen and Kale (2018), Malakar et al. (2019)
Principle 3. Polycentric governance (*Distributional*)	Multiple governing systems operating at multiple levels are needed to manage the plurality of stakeholders, each with divergent interests and priorities	Goldthau (2014), Delina (2012), Delina and Janetos (2018)
Principle 4. Principle-based policymaking and transparency (*Procedural and Distributional*)	Transparency of the ethical guidelines and principles, such as universal access to all and sustainability, that underpins particular actions and decisions invites both criticism and opportunities to engage	Sovacool et al. (2016), McCauley (2018), Bedi (2018)
Principle 5. Medium- to long-term planning and accountability (*Procedural*)	Moving past short-term time horizons for policymaking broadens the focus beyond the here-and-now, to incorporate the possibilities of future consequences into policy deliberations. This must be paired with accountability for energy decision-making	Sovacool and Van de Graaf (2018), Sovacool et al. (2016)
Principle 6. Adaptive management (*Procedural*)	Policies and programmes need to be flexible and adaptive to cope with realised justice outcomes as they transpire. New information, from continued monitoring, gives way to adjustments and readjustments over time	Damgaard et al. (2017), Healy et al. (2019)

Sen's construction of *Nyāya* allows for the emergence of a set of heuristic principles to guide practical reasoning on a realisation-focused account of justice (see Fig. 9.2). To that end, inclusive participation, the first principle to consider, is paramount in order to form a constructive assessment of actual social injustices that (have the potential to) emerge and how they may shape the lived realities of the affected peoples. For Sen, '[t]he central recognition here is that the realisation of justice in the sense of *Nyāya* is not just a matter of judging institutions and rules, but of judging the societies themselves' (2009: 20). Ensuring inclusive and wider stakeholder participation in energy-related decision-making is, therefore, a fundamental first principle, which carries instrumental and normative value for considering, and achieving, just outcomes.
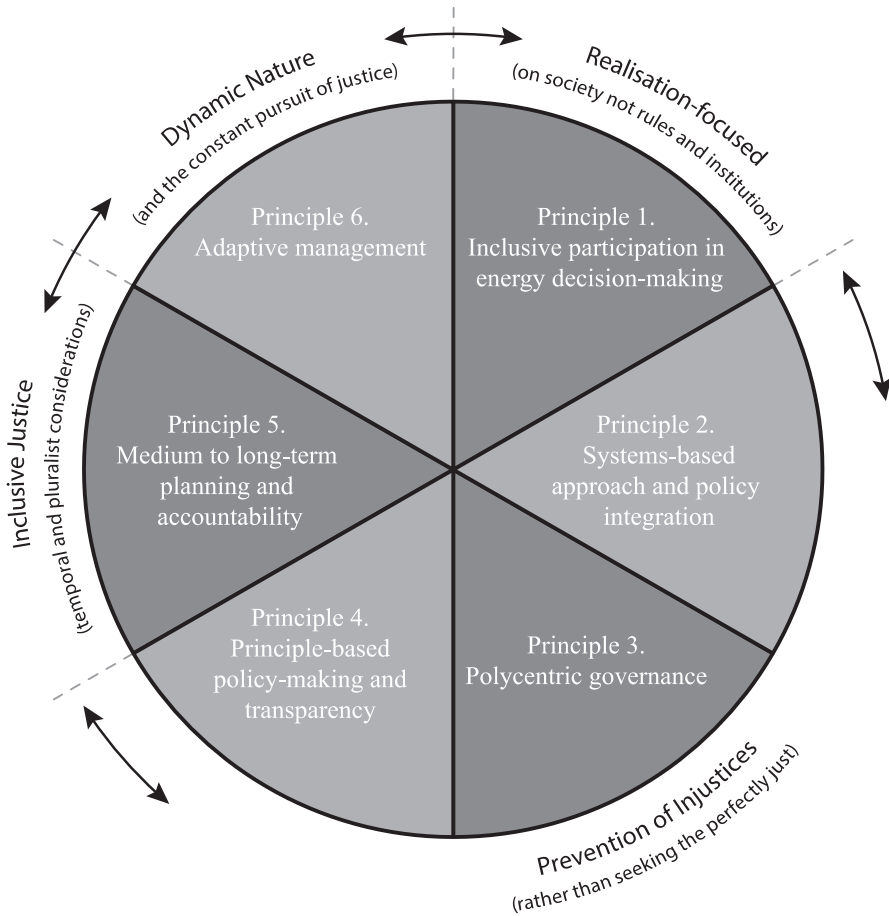
Fig. 9.2 A *Nyāya*-based construction of temporal energy justice

In the discourse on energy transitions, the plurality of intra- and inter-generational stakeholders along with the diversity in their agendas muddles the space for decision-makers. For Sen, it is the prevention of injustices, rather than a perfectly just society, that a *Nyāya*-based perspective promotes, thus flagging the decision-makers' responsibility to identify possible trade-offs: '[a] realisation-focused perspective also makes it easier to understand the importance of the prevention of manifest injustice in the world, rather than seeking the perfectly just' (2009: 22). A systems-based approach to policy integration (Principle 2), polycentric governance (Principle 3) and a policymaking environment that is guided by ethical principles and shared social values (Principle 4) all serve to increase transparency and accountability in these procedures and deliberations. The latter, in turn, allow identifying trade-offs and leveraging synergies to ensure just outcomes in energy decision-making.

Furthermore, a *Nyāya* interpretation of realised justice, inclusive of both a focus on duty and a sensitivity towards consequences, necessitates decision-makers to move beyond short-term thinking by embedding within their process long-term planning and accountability (Principle 5). The focus on comparison, a key component of the *Nyāya* system of public reason and inquiry, helps operationalise this shift and thus serves as a useful foundation for energy policymakers to think of energy justice beyond the immediate value. Energy scholars and practitioners from diverse backgrounds, from the technical to the social sciences, would be familiar with comparative-style tools such as scenario analysis, risk management, case study and narrative inquiry, to name a few. Applying such comparative methods to review and examine energy justice implications would further enable realised justice outcomes from divergent energy transition pathways.

For Sen, considerations of realised justice are essentially dynamic entities which thrive in an environment of review, adaptive feedback and monitoring: '[t]o ask how things are going and whether they can be improved is a constant and inescapable part of the pursuit of justice' (2009: 86). The distinction between *Nīti*—bound by established rules, norms and organisations—and *Nyāya*, which accounts for what actually arises and the lived realities for people in the world, carries with it a responsibility to ensure such *Nītis* do not lead to further injustice. As Sen explains, 'No matter how proper the established organisations might be, if a big fish could still devour a small fish at will, then that must be a patent violation of human justice as *Nyāya*' (2009: 21). Principle 6 of a *Nyāya*-based energy policy platform addresses this dynamic nature of justice, promoting an adaptive management style for deliberations, policy and practice. Adaptive management embeds qualities of flexibility, 'learning by doing' and iteration (Allen et al. 2011; Rist et al. 2012) as a means to manage inherent uncertainties and the dynamic nature of justice outcomes of energy transitions.

Several principles outlined above are certainly not new for energy scholarship, but through presenting them here, they highlight various points of convergence (and divergence) between Western and non-Western philosophies as they relate to energy justice and underlying temporality. In particular, a *Nyāya*-based perspective to unpacking the temporal nature of justice as it manifests in the examined case of Odisha's energy transitions carries with it new food for thought in relation to the value offered by the principles above.

9.6   Conclusion

In this chapter, we have used the temporal energy justice framework founded on Amartya Sen's interpretation of the Hindu *Bhagavad Gita* philosophy, to examine the justice temporalities embedded within the energy policy landscape of the Indian state of Odisha. Odisha presents an insightful case to study, situated firmly within a policy paradox resulting from the twin imperatives of transitioning away from coal to combat climate change and sustainable development for the state.

We find that Odisha's historical policy focus on resource extraction-driven industrial and economic development, akin to emphasising duty over consequence, has

not led to the anticipated trickle-down social and economic benefits for the majority of its people. Contrasting policy positions—a focus on duty versus a sensitivity to consequences—lead us to reveal justice implications of a temporal nature when policymakers fail to meaningfully engage in the latter. The energy sector in Odisha embodies this contrast well. Whilst augmented coal-fired power generation has supported resource industry growth, transitions and reforms in the energy sector have failed to serve the energy impoverished or to make meaningful contributions towards climate mitigation.

Guided by the Hindu philosophy, we introduce *Nyāya*, a Sanskrit term for justice, to appeal to Odisha's energy policymakers for a more comprehensive, inclusive account of realised justice, moving beyond what has historically been a here-and-now-driven policy environment. Whilst this chapter offers an initial introduction, more conceptual and empirical work is needed to help operationalise this temporal framework for energy justice, grounded in non-Western philosophy.

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Chapter 10
LED Lighting Across Borders. Exploring the Plea for Darkness and Value-Sensitive Design with Libbrecht's Comparative Philosophy Model

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Abstract This chapter discusses how a comparative philosophical model can contribute to both substantive and procedural values in energy policy. We discuss the substantive values in the mainstream light-emitting diodes (LEDs) debate and Taylor Stone's alternative plea for darkness. We also explore Value Sensitive Design as a procedural approach. We conclude that the comparative philosophical model of Ulrich Libbrecht can appropriately broaden the set of substantive values used in VSD. We discuss the values of 'by-itself-so' and 'alter-intentionality', which come with the unforeseen necessity of accepting elements from other worldviews and of normativity in the procedural VSD approach.

10.1 Introduction

Outdoor artificial illumination (often a taken-for-granted backdrop of daily life) is a large consumer of energy. Worldwide, it is estimated that around 19% of all electricity generated is used for lighting, of which approximately 8% is used for outdoor stationary lighting (De Almeida et al. 2014). According to the International Energy Agency (2006), there are more than 100 million streetlights alone using around 114 TWh of electricity per year. Thus, how we light our world at night is an

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important topic for energy ethics, and one that transcends regional or national borders.

The need for an ethical analysis of nighttime lighting comes with additional urgency, as a momentous change to how we light our world at night is underway. In particular, the rapid adoption and proliferation of solid-state lighting, and in particular light-emitting diodes (LEDs), is quickly changing both the technical (and moral) landscape of nighttime lighting. Solid-state lighting offers many technical benefits, including improved colour rendition, longer lifespans, and significantly increased efficacy and efficiency. The controllability of LEDs also makes them suitable for new 'smart' lighting innovations, which uses data collection and monitoring to attune illumination to specific environments and requirements. The combination of these two innovations—LEDs and smart lighting—offers the potential for massive energy savings. For example, a report by the US National Academy of Sciences (NAS 2017) estimates that if LEDs reach their target efficacy of 200 lm/W by 2025, it could result in up to 40% savings on energy consumed for lighting by 2030. De Almeida et al. (2014: 45) similarly highlight the potential energy savings in the EU by 2030, stating, '*The estimated savings potential through the application of LED lighting systems in the EU is around 209TWh, which translates into 77Mt of CO2. The economic benefits translate into the equivalent annual electrical output of about 26 large power plants (1000MW electric), with the value of 30 billion Euros of saved electricity costs assuming an average price of 0.15 €/kWh*'.

Given the efficiency and projected cost-effectiveness of (smart) LED lighting, there has been a rapidly increasing adoption in the domain of outdoor illumination, with major cities across the world undertaking (smart) LED retrofit projects for their public spaces. However, despite the promises of smart LED streetlights, the full range of impacts is still emerging. The effects on human and ecosystem health, and if they will further diminish experiences of the night sky, are being debated and researched. Further, whether or not they actually deliver on the promised energy savings has been called into question. Taking a pragmatic perspective, we can see these concerns as highlighting a need to understand *how* this new technology can, and should, be implemented.

In this chapter, we analyse how a particular comparative philosophical model can contribute to both substantive and procedural values in debates about the adoption and use of LEDs. To discuss substantive values, we focus on the strengths and challenges of an alternative set of values centred on a 'plea for darkness' in the LED debate (Stone 2018a, b). We also look at procedural values in the LED debate, taking Value-Sensitive Design (VSD) as an example. VSD represents a proactive method to consider the values of all relevant stakeholders throughout the process of technology design. The basic idea is that VSD can help in analysing how a particular technology design conditions particular behaviour, attitudes and worldviews. In line with the aspirations of this edited volume, we apply the comparative philosophical model to the substantive plea for darkness discussion and the procedural VSD approach.

We opt for the comparative philosophical model of Ulrich Libbrecht, which describes worldviews from three fundamentally different perspectives (we will call

this *ideal types* later on): *immanentism*, *rational transcendence* and *emotional transcendence*. We argue that a classical VSD approach to smart LED lights risks focusing on a standard list of values in keeping with only one of these worldviews, such as control, efficiency and comfort. A focus on the other ways of thinking will bring in very different values. We conclude that Libbrecht's model broadens the set of values used in the LED debate, and that this comes with the unforeseen necessity of accepting elements from other worldviews and of normativity in the procedural VSD approach.

10.2   Substantive Values in the LED Lighting Debate: A Plea for Darkness

While industry, municipal governments, and some researchers have been enthusiastic proponents of LEDs for outdoor lighting, other scholars take a more cautionary approach, and point to a wider set of values that have to be balanced.

Interestingly, the development and adoption of LED outdoor lighting is occurring at the same time as another evaluative shift in nighttime illumination caused by a growing recognition of its negative effects, commonly categorised as 'light pollution'. Artificial nighttime lighting costs (and arguably wastes) billions of dollars annually, uses large amounts of energy, affects human health, disrupts wildlife and ecosystems, and following this argument, hinders our experience of a starry night sky (see Stone 2017, 2018b). LED lighting is often championed as a cost-effective solution to the emergent problems of light pollution. However, current retrofit strategies—while offering lower costs and energy efficiency—are expected to exasperate many adverse effects of light pollution. For example, the blue-rich lighting may further impact human health by disrupting our circadian rhythms, and has been linked to health problems such as insomnia, obesity, and even certain types of cancer (AMA 2016; Chepesiuk 2009). Further, early research indicates that neither energy usage nor skyglow (a form of light pollution that is particularly detrimental to the visibility of the night sky) has decreased alongside the adoption of LEDs (Kyba et al. 2017).

A clarification of the conceptual dimensions of the LED transition, and in particular how 'environmental' value is defined, is thus needed. Proponents of LEDs often say that it is a 'green' technology. This is primarily because of their efficiency and contributions to energy reductions, as well as other issues such as a longer life cycle, lower maintenance requirements and their avoidance of mercury, amongst other factors. Thus, a largely technical definition of sustainability is applied. However, criticisms of the widespread adoption of (especially blue-rich or white-coloured light) LEDs for outdoor lighting by the public, as well as prominent voices such as the International Dark-Sky Association and the American Medical Association, suggest that a broader, more comprehensive analysis of the values at stake would improve the moral and social acceptability of this new technology.

To explore values relevant to the LED transition, we take a critical look at the recent work by Stone (2017, 2018a, b, 2019). In particular, we examine Stone's 'The Value of Darkness: A Moral Framework for Urban Nighttime Lighting' (2018b), which explores the landscape of environmental values relevant to night-time lighting. Stone argues for a shift away from avoiding or mitigating light pollution, instead moving towards a recognition and maximisation of the positive features of darkness. Darkness has long been associated with largely negative values and is often associated with danger or risk (e.g. Nye 1990; Schivelbusch 1988), leading us to seek out solutions via control and dominance over these threats. Darkness is also seen to be backwards, in opposition to the progress and innovation brought about by artificial illumination. Cities characterise themselves by their illuminated skyline, not by their darkness, for instance. Indeed, through the development and proliferation of lighting technologies, we have effectively conquered the night (Melbin 1987). The (urban) night has become a prolongation of the day due to the proliferation of electric lighting.

In 'The Value of Darkness' (2018b), Stone proposes a set of environmental values meant to reflect the changing landscape of moral evaluations brought about by a growing recognition of the negative impacts of artificial light at night. Firstly, he states that efficiency and sustainability are important values for darkness. He refers to Gallaway et al. (2010), stating that 30% of light in the U.S. is wasted (equivalent to a yearly loss of almost $7 billion in U.S.), as well as to Morgan-Taylor's (2014) similar estimate of €5 billion in Europe. Stone also mentions that darkness may be beneficial for healthiness and happiness, for example, by following the biorhythm and focusing on experience compared to consumption. Stone classifies these values as instrumental because darkness here is a means to achieve another end.

But Stone also sees intrinsic values in darkness. Darkness is useful for the conservation of species and biodiversity. Contact with nature is also an intrinsic value central to environmental philosophy, which is argued to be a central facet of dark or 'natural' nights. Further, the visibility of the starry sky and wonder and beauty are intrinsic values linked to darkness. Lastly, he states that the loss of darkness also includes the loss of cultural heritage. Overall, this discussion indicates a clear need to clarify LED applications' strengths and weaknesses, and to critically examine the policy choices shaping the use of this new lighting technology.

10.3   Procedural Values in the LED Lighting Debate: Value-Sensitive Design

As we want to explore the procedural aspects of the LED lighting debate, we can analyse a variety of participation methods (see, for example, Rowe and Frewer 2000; Laes and Bombaerts 2006) to better understand the interplay between the need for participation and the quality of procedures. In the limitation of this chapter, we concentrate on one example. We focus on Value Sensitive Design (VSD) as a

validated and widely used methodology to implement values in such design processes. As said earlier, VSD represents a proactive method to consider the values of all relevant stakeholders throughout the process of technology design. The basic idea is that VSD can help in analysing how a particular technology design conditions particular behaviour, attitudes and worldviews.

The practice of VSD is characterised by a diversity of approaches, theoretical backgrounds, application domains and values for which it is designed. The VSD core is an iterative, tripartite methodology including the results of conceptual, empirical and technological investigations. The conceptual part maps the relevant stakeholders, their values and the value conflicts in the innovation process and the use of the new technology. As such, VSD enables relevant stakeholders to balance a multitude of values such as well-being (Brey 2015), accountability and transparency (Hulstijn and Burgemeestre 2014), democracy and justice (Pols and Spahn 2015), inclusiveness (Keates 2015), privacy (Warnier et al. 2015), trust (Nickel 2015) and responsibility (Royakkers and Orbons 2015). The empirical part qualitatively and quantitatively studies the interaction between design aspects in relation to stakeholders' understandings and experiences of technology. The technical part then primarily studies how specific technology features implicate certain values. Technical investigations can involve either analysis of how people use related technologies, or the design of systems to support values identified in the conceptual and empirical investigations (Friedman et al. 2013).

The original VSD scholars legitimise their method with regard to Habermassian communicative action: 'In communicative action, each utterance implicitly raises four validity claims: to the comprehensibility of the utterance, to the truth of its propositional content, to the truthfulness of the expression of the speaker's intent, and to the rightness and appropriateness of the utterance with respect to existing norms and values' (Borning et al. 2005: 454). Thus, VSD can treat a broad spectrum of values. However, one of the challenges of VSD is exactly which values are treated (Davis and Nathan 2015). The answer largely depends on the initiators of the process, the guardians of the process and the stakeholders present. Some values might be lacking, for instance, leading to unforeseen consequences or even non-acceptance in the end of the process. As such, we seek an approach that enables VSD to discuss a list of values that is practical enough to use, but also covers a range of values that is wide enough.

Stone's work on the value of darkness can be understood as satisfying the conceptual step in the VSD methodology. It strives to establish the philosophical grounds for incorporating environmental values into lighting technologies and policies, as well as to synthesise and categorise current research and arguments made for the protection and preservation of 'natural' nights. However, when looking towards the operationalisation of Stone's framework for the LED transition (i.e. the technical implementation stage of VSD research), important conceptual questions arise.

We can ask if the LED lighting debate as pictured above is analysed broadly enough. Should *environmental* values, for example, be disentangled from *social* values associated with lighting and darkness in a VSD process? Stone's plea seems

to clash with fundamental economic values that are ubiquitous in technology debates, such as how far do we want to limit 24-h economic activity, or what we are willing to sacrifice to allow for access to a starry sky? And do we want to sacrifice—even only a little bit—of our safety and security?[1]

Moreover, is the identified valuableness of darkness proposed by Stone reliant on a particular dominant perspective that is not shared by all people? The nine identified environmental values associated with darkness are presented in a somewhat descriptive way. They are presented as things that, in general, people value, and are thus important considerations, without identifying or arguing for an underlying ontological or meta-ethical basis for the worthiness of the values. This in turn can lead to practical questions of 'if' and 'how' the 'designing for darkness' approach proposed by Stone elsewhere (Stone 2019) can manifest in different cultural, political, and geographical contexts. As such, the question becomes if, and how, a 'LED transition debate across borders' is possible.

Our reflection so far raises questions about the *fundamental principles of VSD methodology*. In broadening the set of values from environmental to also societal and deepening the discussion to underlying values, the role of VSD facilitators might change. Instead of bringing up and mapping the relevant values in a neutral way, the role now seems to shift more to steering the debate towards 'Value Sensitive Design across borders'.

10.4   Ulrich Libbrecht's Comparative Philosophy Model

10.4.1   The Overall Model

In the above sections, we listed the substantive challenges we encountered in the plea for darkness and the procedural ones we faced in the VSD discussion. In the frame of this volume, we will now explore how a comparative philosophical model can answer these questions. We utilise Ulrich Libbrecht's comparative philosophy model, which starts from an analysis of three different philosophical perspectives based on three fundamentally different sets of assumptions and tries to integrate them in one model. Libbrecht calls these sets of coherent assumptions worldviews. By considering three fundamental worldviews, it deals with complexity when looking for underlying structures, but it is also manageable and operational. As such, the model itself provides integration and distinguishes itself from a universalism that looks for one main super-value that unites everyone's main striving. Its description also avoids the over-complexity of pluralism as an irreducible and incommensurable set of different opinions. 'As citizen of the world I am trying to integrate them [*the three different worldviews*], not into a kind of sameness, but into a global model that admits dialogue' (Libbrecht 2007: 71).

The three basic worldviews can be described by different elaborations of the philosophical concepts immanence and transcendence (for a graphical view, see

Fig. 12.1 in Oostveen in this Volume). Libbrecht considers nature as the immanent basis (*immanere = to remain within*) that can be transcended (*transcendere = to rise above, to exceed)* by culture, science and technology. Therefore, every philosophical elaboration on humans, world and technology will have to relate to both nature and culture. But their implicit assumptions how to focus on happiness, harmony, truth, or wisdom clearly differ. The more *immanent* focused worldviews strive mainly for the direct experience of nature and of the natural processes themselves. Transcendent worldviews emphasise to exceed and overcome the direct experience of nature and of the natural processes. Libbrecht states that this transcendence can be achieved in mainly two different ways. Humans can use rationality to understand nature with science and control it by using technology. This *rational transcendence* focuses on knowledge and empirical experimentation to find the truth. But humans can also develop an emotional transcendence, giving attention to the inner experience of the unity of humans and nature and to exceed the natural ego. Libbrecht (2007: 122–3) calls this focus 'alter-intentionality': 'When I reveal myself emotionally to the Other, it induces in me a certain mood, puts me in an emotional state, yet one that does not appropriate. I am prepared to undergo feelings of displeasure to have an experience of the Mystery'.

Technology can be seen as a direct consequence of rational transcendence (Feenberg 2012; Misa et al. 2004), but Libbrecht also considers technology as a condition for emotional transcendence. Technology ensures that humans can liberate themselves from the natural struggle for life, which creates room for other emotions such as poignancy, wonder and compassion. Technology can also transfer many tasks, liberating time to focus on other things if the free time is not filled in right away with other practical tasks or addiction (O'Keeffe and Clarke-Pearson 2011). Therefore, technology has to preserve its middle position and be conscious of its value in the development of other values beyond anything purely scientific and technological. Therefore, technology is also important in immanence-oriented worldviews because technology should be restricted and guided by nature, which can be called 'guiding technology by Dao' (以道驭术). This immanent idea indicates that technology itself should be 'good', meaning that human-made technology respects the inherent qualities of nature (Wang and Zhu 2011).

Based on these three basic worldviews, Libbrecht sees three basic relations between humans (Subject) and the world (Object). First, in the purely immanent worldview, the subject is an organic part of the object because the body directly participates to the natural processes and rhythms. The object informs the subject by direct experience. Libbrecht indicates this with the mathematical relation $S \subset O$, the subject is ego-intentional. Secondly, in rational transcendence, the subject opposes the object. This is its rationality. The subject places herself at a rational distance against reality. She develops scientific insights and technology with which she transcends, controls and redirects the natural given. This is indicated by $S \leftrightarrow O$. Thirdly, in the emotional transcendence, the subject becomes one with the object. The subject is in inner experiential relation with the entire reality. This is described by $S = O$ and the subject is basically alter-intentional.

These three perspectives in their purest forms do never appear in reality. Libbrecht therefore calls them *ideal types* (2009: 32). In the remainder of this chapter, we often simply refer to these *ideal types of worldviews* as *worldviews*. However, every worldview in the real world is a non-clearly distinguishable combination of the three perspectives described above. It is therefore relevant to study the ideal types as they constitute worldviews in the real world. Some worldviews are strongly oriented to one of the three ideal types. Following Libbrecht (2007, 95), we then talk about (for example) immanence-*oriented* worldviews.

Every worldview is a coherent set of different elements that help to interpret concepts of being (ontological), knowledge (epistemological), humans (anthropological), but also how the concepts of time, space, causality, ethics and language are used (Libbrecht 2009: 36–37). Below, we explain the ideal types in more detail as a coherent set of different element. An overview of these different elements per worldview can be found in Table 10.1.

Table 10.1 Overview of the worldview elements of immanentism, rational transcendence and transcendent emotionality, taken from Libbrecht (2007: 290), except from lines in italic of 'Value determination(s)' and 'Technologies', which are the author's

Basic relations → // Different worldview elements ↓	S ⊂ O	S ↔ O	S = O
Worldviews	Immanentism	Rational transcendence	Emotional transcendence
Energy	Bound	Free, goal-oriented	Free, field of action
Value determinations	*By-itself-so, non-action, humans as part of nature*	*Rational insight, control and comfort*	*Alter-intentionality, compassion, awareness, equanimity*
Ontology	Becoming	Being	Non-being
Epistemology, methodologies	Direct experience	Rational knowledge and empirical observation, logic	Internal experience Mysticity, authenticity
View on humans	Body	Rational function	Emotional function
Time	Cyclic	Linear	Timeless
Space	Ecological	Mathematical	Mystical field
Causality	Reticular	Linear/binary	Field
Ethics	*Confidence in by-itself-so, non-action*	*Legalism-justification*	*Love, compassion*
Language	Metaphoric	Logic/mathematic	Symbolic/silence
Technologies	*Attuned to and subordinate to the natural process*	*Control of natural processes, comfort of man*	*Facilitating alter-intentionality*

10.4.2   S ⊂ O: Humans as Part of Nature

Firstly, nature-focused worldviews start from the basic relation S ⊂ O. The subject (S) feels embedded (⊂) in the surroundings or world (O = object). These immanent philosophies are cosmocentric and see humans as very small and timely parts of the whole cosmic process.

   Immanence-oriented worldviews can be found all over the globe. Libbrecht (2007: 550–572) refers to several examples such as traditional native American worldviews, Daoism, Japanese Shintoism, Sub-Saharan Africa philosophies, forms of nature mysticism and pantheism, and Buddhist philosophers such as twentieth-century's Nishida. Although they were mostly peripheral, some Western philosophies that stress natural becoming such as Stoa, Heraclitus, Nietzsche, Whitehead or Bergson, or that stress pantheism such as Spinoza can also be considered as philosophies that carry a strong immanent element.

   The main value of immanent philosophies is nature itself. The traditional Chinese word for nature自然 (ziran) means 'by itself so' or 'the way things are'. Every part of nature—a blade of grass, bird or planet—moves without human beings or gods. It moves in interaction with the whole reticulum or network embedded in the ecological space. This large cosmic process in which everything including man, arises and passes away is the great wonder and therefore sacral. It is the basis for value creation, what happens by itself so (Dao 道 or 'way' in Daoism) is more precious compared than what is added by human beings. 'Becoming' can be experienced in every part of nature and is expressed in metaphoric language borrowed from nature itself.

   Acting does not start consciously from an individual purpose, but everything happens starting from the organic network (reticular). This makes nature ethically indifferent. Nature is neither good nor bad. Life and death or day and night are considered inherent to the natural process. Death and night therefore are not considered as bad, but a necessary condition for the totality. Time in this view is inherently cyclic as it expresses the arising and passing away of everything. 'Body' is seen as the crucial aspect of man. This body maintains itself by reacting to the surroundings with its adaptive phylogenetic knowledge that it inherently holds. The S ⊂ O relation also implies that the subject is always embedded in a group or community. Although life is strongly determined by survival, it is not the individual survival, but the survival of the group or the cosmos one is included in.

   As human beings have freedom, the need for ethics emerges (Libbrecht 2007: 98). Being attuned to natural rhythms and bodily processes does not need external rules or ethics. Humans only need to keep watching over the natural process to be attuned to themselves. Daoism grasps this with the concept of non-action (*wu-wei* 无为), meaning not disturb the natural way. This is of course an idealised state, since we cannot live without transcendence. But immanentists as the Daoists believe we should always be critical to every form of innovation and progress and we should reduce our technological interventions to a minimum. Progress will eventually bring us in a permanent state of agitation (Libbrecht 2007: 154). Progress is also superfluous, in that the most important things happen by themselves.

Also other scholars referred to *wu-wei*. Yu and Wang (2015), for example, write about the 'unity of humans and nature', which signifies humans and nature being integrated into an organic unity, has prevailed from ancient China. Being a valuable gift born out of nature, mankind should awe and respect nature, and obey the natural law. Other than protecting itself, nature has the ability to bless human beings reproducing themselves, so that there is no need to take the ethical responsibility of protecting nature. Within the idea of 'unity of humans and nature', specific technical activities should 'conform to both natural law and human nature'(顺天应人), and be restricted and guided by 'Dao', so as to meet the standard of 'Dao'. Tracing back to pre-Qin times, Confucianism proposed 'sponsoring heaven and earth for gestation' (赞天地之化育). The word 'sponsor'(赞) indicated that human technical activities should be in accord with natural law to 'sponsor' transforming and nourishing powers of Heaven and Earth. In doing so, technology will benefit the survival and development of mankind so that 'one could own the powers of the Universe'(与天地相参). The concept of 'non-action'(无为), being understood as no unnatural action rather than as being complete passivity, implies that mankind should take appropriate action in accordance with the true nature of the universe, complying with the law of development of the universe, so as to realise 'Dao's consistency of human with nature'(道法自然).

There is an important difference if the justification of LED technology had or has no immanence issues. We will come back to this in the discussion, but as an illustration here, we can already say that a justification on LED lighting with little immanent elements is often missing the inherent value of nature and has difficulty doing justice to direct experience. For justifications to be immanence focused, they have to be cyclic, reticular and metaphoric in their approach and are quite different from other approaches. A fruitful interaction therefore demands awareness of these aspects and a strong willingness to bridge the different worldviews.

10.4.3 S↔O: Humans Opposed to Nature

In 'Greek philosophy—with the exception of Heraclitus and the Stoics—' we see 'a struggle against becoming, driven by the idea that the everlasting is the perfect' (Libbrecht 2009: 48). This resulted in dualistic theories about eternally lasting elements of 'being': Empedocles' theory of the four elements, Parmenides' theory of being, Democritus' theory of atoms, Plato's theory of ideas and Aristotle's unmoved mover, are all concepts of everlasting elements transcending natural becoming, for instance. Libbrecht gives more examples in summarising the fundamental items in the Greek classical worldview (2007: 244–245). Further, he claims: 'To me, the Islamic and Jewish (next to the Christian) philosophies are highly tributary to Greek thought' (2009: 32). 'They believe in the existence of Being as such, i.e. in the Absolute, which is mostly conceived as unchanging, everlasting' (2007: 389). According to Libbrecht, the desacralising of nature and cosmos starts in Greek

thought (2007: 244) and is perpetuated in the theontic traditions (Judaism, Christianity, Islam) (2007: 554–556).

The basis of Western transcendent rationality starts with Parmenides who stated that the real reality is linked with what can be thought and is continued by Hegel's idea that the real reality *is* rational (Libbrecht 2007: 158). Indian Hinduist philosophies have known this as well, although peripherally. The atomic pluralism of the Vaiṣeṣika and the systematic development of logic of the Nyāya are examples hereof, although they remain embedded in a spiritual context focused on spiritual redemption (Libbrecht et al. 2016: 60). Chinese philosophies have always been very pragmatic, but seldom purely rational (S↔O) because of their fundamental premise that humans are part of nature (S ⊂ O).

In sciences, the dynamic fluid of the world of becoming is captured in theories, formulas and definitions by experiment and directed observation. Experimental science projects reality to a mathematical space and disaggregates causal relations as much as possible to binary parts expressed in logic and mathematical language. It deduces the natural rhythm of time into a linear time that is mathematically divided into equal parts. Human beings add new artefacts into reality, make the outside world controllable and contribute to man's comfort as central endeavour. The division S↔O is often seen as a core necessity of objectivity in classical scientific methodology (although there is a large *observer effect* debate on this since the start of quantum physics).

Rationality also has a crucial role in ethics. According to Greek philosophy, reason realises goodness and reason is the basis for laws and prescriptions that arrange human coexistence. Moreover, in the theontic religions, goodness and charity are pursued by adhering to the laws of the god. In Chinese philosophy, this ethical approach also occurred in *fǎ jiā* 法家 (Legalism) aiming at orderly coexistence by subjugating to laws, whereas other Chinese philosophies strive for goodness more by emotional development, as Confucianism by *li*, 礼.

A rational transcendence worldview optimises rational knowledge, empirical observation and logic. It is linear, binary and focuses on control of natural processes in the comfort of man. It is at the basis of the tremendous technological progress. But from within this worldview, it is difficult to understand and accept the implicit value of nature and the value of direct experience as we sketched in the immanence worldview. This worldview also has difficulties to provide a justification for internal experience, emotions, silence and compassion. These important human aspects are core of a third worldview that we will sketch in the next part.

10.4.4   S = O: The Unity of Humans and Nature

Thirdly, we elaborate on the transcendent emotionality worldview. This worldview takes S=O as its basic relation, which is part of philosophies that postulate the fundamental unity of all what is. It is central to mystical traditions as Buddhism, Sufism, Advaita Vedanta and Meister Eckhart. This transcendent emotionality can

also be found in the theories of the One of Plotinus, of Friedrich Schelling's energy concept that later was taken by Schopenhauer and Nietzsche, of the Irish John Scottus Eriugena and of Baruch Spinoza. Although this monist theory is present in the entire Western philosophy, it remains peripheral, contrary to the Asian traditions taking fundamental unity as a basic assumption. These traditions also focus on experiencing unity instead of thinking it as the European counterparts do.

The whole can neither be observed nor approached by reason. Via yoga and meditation, a direct, immediate and intuitive vision of reality is experienced. The S=O relation is an inner experience relation. It is important to state that the name 'emotionalism' does not refer to a classical Western concept of 'emotions', but to this immediate and intuitive vision of reality in which the ego disappears in alter-intentionality.

When someone wants to express or reflect on the experience, the relation immediately becomes S↔O. Therefore, silence is an important feature and language can only be symbolic. The relation is mystic and focuses on non-being (non-conceptualisation) and timelessness. This view does not deny existence but denies the conceptualisation of the fundament of existence. Libbrecht uses the metaphor of an electromagnetic field to describe the inner movement of oneness. The cause is not visible; we can only determine it because it moves things, in this case the inner life of persons. For transcendent emotionalists, the coherence is caused by a mystic field. Reality is considered as fundamentally not knowable (Libbrecht (2007: 129) calls this "mysticity"). Transcendent emotionalists accept that science can provide knowledge on all observable things, but that scientific knowledge by definition always will face the boundaries of the unknowable.

We are not separated individuals, but unified with everything in reality. In Buddhism, this leads to the principle of ahimsa (nonviolence). Ethical values are compassion (karuṇā), sympathetic joy (muditā), friendliness (maitrī), awareness (smriti) and equanimity (upekshā) (Kalupahana 1995: 61). Contrary to legalistic ethics, love in Buddhism is not a law, but a spontaneous emergence stemming from developing emotionality. Central in ethics is the approach of intentionality. Is ethical behaviour focused on the wholeness and alter-intentionality or does one's ego-intentionally break the totality apart into several individuals?

One can ask how technological developments incite users to ego- or alter-intentionality and how much the individual parts or the totality. As mentioned earlier, technology can be beneficial to create room for the development of transcendent emotionality, but it can also create extra hindrances.

The transcendent emotionality worldview is strongly aware of the importance of compassion, equanimity, internal experience, emotion, compassion and silence. It is at the basis of a rich internal life. But from within this worldview, it is difficult to provide a justification to solve human problems with technology or focus on the direct experience as we sketched in the immanence worldview. Thirdly, we elaborate on the emotional transcendence-oriented worldviews. These worldviews take S=O as its basic relation, which are part of philosophies that postulate the fundamental unity of all what is. 'It was already assumed at the time of the Upanishads that there were two levels of reality: on the one hand the empirical multiplicity of our observable world, and on the other the universal oneness' (2007: 258). Further,

Libbrecht states that this is an assumption in every philosophy that has a mystical dimension. He finds this mystical dimension in traditions around the globe (2016) as Buddhism, Sufism, Advaita Vedanta and Western mystics (2007: 160). This idea of fundamental oneness can also be found in the theories of the One of Plotinus, of Friedrich Schelling's energy concept that later was taken by Schopenhauer and Nietzsche, of the Irish John Scottus Eriugena and of Baruch Spinoza. Although this monist theory is present in the entire Western philosophy, it remains peripheral, whereas in several Indian and Japanese philosophies, this became a central point. These traditions also focus on *experiencing* unity instead of *thinking* unity as the European counterparts do.

The whole can neither be observed nor approached by reason. The S=O relation is an inner experience relation. It is important to state that the name 'emotionalism' does not refer to a classical Western concept of 'emotions', but to this immediate and intuitive vision of reality in which the ego disappears in alter-intentionality. The twentieth-century Japanese philosopher Nishida describes this as a pure experience: 'When one directly experience one's own state of consciousness, there is not yet a subject or an object, and knowing and its object are completely unified' (1990: 3–4).

When someone wants to express or reflect on the experience, the relation immediately becomes S↔O, because reflection requires distance. Therefore, silence is an important feature and language can only be symbolic. The relation is mystic and focuses on non-being (non-conceptualisation) and timelessness. This view does not deny existence, but denies the conceptualisation of the fundament of existence. Libbrecht uses the metaphor of an electromagnetic field to describe the inner movement of oneness. The cause is not visible; we can only determine it because it moves things, in this case, the inner life of persons. For emotionally transcendentalists, the coherence is caused by a mystic field. Reality is considered as fundamentally not knowable (mysticity). Transcendent emotionalists accept that science can provide knowledge on all observable things, but that scientific knowledge by definition always will face the boundaries of the unknowable.

We are not separated individuals, but unified with everything in reality. In Buddhism, this leads to the principle of ahimsa (nonviolence). Ethical values are compassion (karuṇā), sympathetic joy (muditā), friendliness (maitrī) and equanimity (upekshā) (Kalupahana 1995: 61). Contrary to legalistic ethics, love can also be a spontaneous emergence stemming from developing emotionality. Central in ethics is the approach of intentionality. Is ethical behaviour focused on the wholeness and alter-intentionality or does one's ego-intentionally break the totality apart into several individuals?

One can ask how technological developments incite users to ego- or alter-intentionality and how much the individual parts or the totality. As mentioned earlier, technology can be beneficial to create room for the development of emotional transcendence, but it can also create extra hindrances.

People with emotional transcendence-oriented worldviews are strongly aware of the importance of compassion, equanimity, internal experience, emotion, compassion and silence. It is at the basis of a rich internal life. But from within this worldview, it is difficult to provide a justification to solve human problems with technology or focus on the direct experience as we sketched in the immanence worldview.

10.5   Libbrecht's Model as Input for VSD in the LED Transition Debate

The elaborations above enable an overview of the three basic relations and their accompanying underlying assumptions (see Table 10.1). Libbrecht has selected these basic relations as being very different. As a consequence, the fundamentally different underlying assumptions are also difficult to combine. A rational transcendence approach, for example, favours rational insight, control and comfort. Straightforward pathways for including the by-itself-so and the alter-intentionality and mysticity are far from evident. As the intrinsic value of nature, but also emotions, awareness, and compassion might be seen as very important elements, the rational transcendent approach has fundamental difficulties justifying these aspects from within. If one worldview genuinely wants to acknowledge values from the other worldviews, an in-depth dialogue is needed, which will lead to questioning both the other and its own worldview aspects.

The same goes for the VSD application. If the rational transcendence worldview is central in the VSD exercise, values such as well-being, accountability and transparency, democracy and justice, privacy or trust will automatically become central. The values of by-itself-so, alter-intentionality or mysticity will be at least far less prominent, and maybe completely absent in the debate.

This underlines the reason to opt for the Libbrecht model. By considering three fundamental worldviews, it deals with complexity, looking for underlying structures, but it is also manageable. As such, the model itself provides integration and distinguishes itself from a universalism that looks for one main super-value that unites everyone's main striving. Its description also avoids the over-complexity of pluralism as an irreducible and incommensurable set of different opinions.

This raises a third fundamental question about the usability or limits of the model of Libbrecht. Can the Libbrecht model be accepted and meaningfully used in VSD on LED transitions? Or, differently stated, can the Libbrecht model be used across borders?

10.6   Discussion

Throughout this chapter, we encountered three questions that we will further consider here. Can the Libbrecht model be used across borders of different ways of thinking? Can the Value Sensitive Design methodology be used across borders? And, can the value clarification in the LED transition debate be performed across borders? We will discuss the consequences of the interaction between the Libbrecht model, VSD methodology and LED transitions.

10.6.1   Libbrecht's Model Across Borders: Consequences of the Plea for Intrinsic Value

Above, we drew not more than a thumbnail sketch of the whole Libbrecht model. Libbrecht (2007) used 600 dense pages to accurately describe many details and consequences of his model. Suffice to say, the model is able to explain much more than we state here. We are aware that our brief reflection covers may philosophies that also warrant much more precise elaboration. Nevertheless, we can still offer some reflections on, and challenges to, Libbrecht's approach.

Firstly, the question about the comparative merits of the model should be clarified. We argue that the model brings in explicitly new values into the debate. Whereas standard discourse on LEDs focuses on typical transcendent rationalist values such as efficiency and effectiveness, Stone's plea for darkness (2018b) adds qualitative values such as happiness, stellar visibility, and wonder and beauty. And as we have seen above, using the Libbrecht model in VSD brings in fundamentally different values of by-itself-so, non-action, alter-intentionality, awareness and equanimity in the debate on LED. An important question is how, if at all, these values are implicitly embedded in Stone's approach. Does the adoption of Stone's framework require (at least partially) an immanent or a transcendent emotionalist worldview? We will further elaborate this question in Sect. 10.6.3 below.

Secondly, the model is elaborated from a philosophical point of view in the first place, with little explicit elaboration on ethical issues. Thus, the role of ethics and particular values is less elaborated. What is more, the normativity of the three basic worldviews and how this factors into their relations is present but not discussed in detail. The ideal type positions (see Fig. 12.1 in Chap. 12) are clearly not preferable and in themselves very extremist. Too much focus on the direct experience is too bestial. Too much rationality reduces us to a mechanistic view of humans. Too much inner experience risks limiting societal contributions. Instead, in the chapter about happiness and culture (2007: 522–530), Libbrecht mentions that a balanced combination of these three different basic philosophies can contribute to a more harmonious and wholesome human being, culture and world. To the authors of this chapter, this seems a very important normative statement following from the model, even if it is not explicitly formulated. Even if the Libbrecht model is used as a heuristic one, it implicitly prescribes the more fundamental positions that a balance between rationality, immanence and emotional transcendence is needed. Many questions arise. What is the importance of balance? What is a wholesome human being, and what is the role and purpose to be one? How are present-day humans different from wholesome human being? We will discuss the consequences for VSD in Sect. 10.6.2.

Thirdly, the Libbrecht model helps to reflect on the far-reaching assumptions of Stone's plea for taking the intrinsic value of darkness into account. Accepting intrinsic value of nature or mysticism is a non-rational transcendence point of view. Accepting intrinsic value therefore means moving more towards the other two worldviews. It essentially requires us to shift from the central position of human beings in nature (S↔O), to human beings as a partial element of the surrounding

world. When people refer to intrinsic values, the subject (S) feels embedded ([Symbol]) in the surroundings or world (O = object), or the subject feels the fundamental unity of all what is in an S=O basic relation.

Starting from the definition of worldview in the Libbrecht model, and from the overview given in Table 10.1, it follows that if a justification uses one element in a particular worldview, it means at least that there will be an inclination to take the other elements from this worldview for granted as well. It is still possible to accept elements from other worldviews, but it is a tougher choice to go against this worldview coherence (See also Oostveen in this volume.). An argumentation from a rational transcendence perspective, for example, will more easily use basic values such as control and comfort, rational knowledge and observation, linear time and binary causality. It will be very difficult to incorporate non-action, direct experience or reticular causality.

As worldview coherence makes accepting one's own worldview elements easier and accepting others more difficult, this also means shifting towards other elements of emotional transcendence or immanence. Accepting intrinsic value therefore means a stronger role of direct and internal experience, values of by-itself-so, non-action or awareness and equanimity that become more important. The interpretation of Stone's list of values such as efficiency, sustainability, healthiness, happiness, and wonder and beauty will slightly shift. Pertinently, accepting intrinsic value in a VSD process therefore means asking questions differently. The efficiency debate is opened to broader questions, such as how much we wish to question the function and need for 24-h society? Discussions about healthiness will be different from an immanent point of view, accepting life and death or bodily growth and decline, leading in turn to different (less central) positions of safety and security in people's needs. Looking for happiness changes if desire, pleasure and pain are inquired with equanimeous awareness of the emotional transcendence.

10.6.2   VSD Across Borders: Helping Human Beings and Cultures to Become More Wholesome

We described how the Libbrecht model puts forward the normative assumption that the ideal type worldviews are less desirable compared to a balanced mix. If we follow this normative assumption that a balanced individual is an individual that incorporates elements from the three worldviews, this could lead to a conclusion that that many people could need more immanence and emotional transcendence. A balanced combination of these three different basic philosophies can contribute to a more wholesome human being and culture. As a consequence, one could argue that the role of VSD then should be to stretch people at least by making them decide about their position towards the three worldviews.

Accepting this point of view necessitates other basic assumptions of VSD. The fourth Habermassian validity claim to the 'rightness and appropriateness of the

utterance with respect to existing norms and values' (Borning et al. 2005) together with the 'power free dialogue' claim becomes problematic. Whereas the original VSD approach seems to ask for plurality, the Libbrecht model seems to ask for introducing values from other worldviews in the LED debate in order to stretch people's more one-sided worldviews—one could even argue, whether they ask for this or not. The role of a VSD facilitator changes from neutral, transparent, power-free value facilitation to a critical expert (Bombaerts and Laes 2007; Bombaerts et al. 2006) steering towards other worldviews in order to have a broader view.

The challenge for this procedural view was also analysed by others such as Jacobs and Huldtgren (2018) in a plea to incorporate ethical commitments in VSD. These authors argue to use mid-level ethical approaches consisting of a cluster of pivotal moral principles functioning as general guidelines, such as the capability approach. Of course, inserting 'more transparency' in a design process where transparency is widely acknowledged as an important value seems uncontroversial. The resistance will be limited, non-existing or merely strategic. Inserting by-itself-so, non-action, immediate and intuitive vision of reality, alter-intentionality, awareness or equanimity as elements of a mid-level theory is far more abstract from a rational point of view for people with a mainly rational transcendent worldview. Therefore, it is not entirely obvious how to realise this via technological innovation. How much will people want to sacrifice (perceived) safety and security at night to allow more wonder or visibility of a starry sky? Will the application of the Libbrecht model make things too complex? What about more delicate circumstances such as situations including risks or crisis (Laes et al. 2009; Turcanu et al. 2007)? Some will say that finding a balance between 'Western' or rational transcendent values is already difficult enough and 'broadening' the debate with the Libbrecht model is an unrealistic attempt. In contrast, we believe it is not, and mainly because both the plea for darkness and the Libbrecht model at least try to overcome boundaries that are currently difficult to overcome. This includes the alter-intentionality to put more value to nature than it currently receives in actual LED policy decisions. Including alter-intentionality in VSD will certainly be felt as more far-reaching and will probably be less easily implemented as a mid-level ethical approach in VSD processes. The environmental challenges we currently face seem to require new and more radical ethical models, of which the Libbrecht model could be a contribution.

10.6.3 *LED Transition Debate Across Borders: Further Broadening the Debate*

The Libbrecht analysis of the ontology, epistemology, ethics and view on technology of the three worldviews offers a constructive elucidation of values (and VSD) informing the transition to LED outdoor lighting. The analysis in this chapter allows a reframing of the question of environmental versus social values raised above, instead asserting that they should not be seen in opposition. Rather, they should be

analysed as part of a greater whole. Tangibly, this would imply that a VSD approach to (smart) LED outdoor lighting should seek to circumvent this question (although perhaps still operating in a largely rationalistic framework) via interventions like incrementally darkening spaces and having environmentally responsive lighting (see Stone 2019 Chap. 5, for an elaboration on these proposals). In both cases, the new technical capabilities of (smart) LEDs would be exploited to foster both the instrumental and intrinsic values of darkness. Yet in doing so, they do not (at least explicitly) confront social values associated with nighttime lighting (safety, night-life, 24/7 economies, etc.)

Libbrecht's model provides some clarity and grounding for the defining and positioning of (environmental) values in debates about the adoption of LEDs for outdoor lighting. In particular, Stone's approach to darkness seeks to merge, or at least put into dialogue, immanence, transcendent emotionalism and rational transcendence. In this context, appreciating and fostering darkness is about harmony instead of conquering and subjugating nature. It is about (re)discovering a sort of 'dynamic balance' between light and dark, and appreciating the moral significance of such a goal (to use Libbrecht's language). It could also be about finding new attitudes towards 'control' and increasing equanimity and awareness. Achieving a balance, or harmony, between lighting and darkness thus becomes a fundamental underlying goal for LED outdoor lighting. Safety and security at night can be balanced with wonder or visibility of a starry sky if people are prepared to look differently at the role of illumination in providing safety and security, for example.

An interesting question (especially for the context of this book) is then how immanence-oriented ethics ($S \subset O$) can be inserted into the present-day technological rational transcendence-oriented debate about nighttime lighting. In other words, how do we practically incorporate and appreciate the intrinsic value of darkness? Stone (2018a) elaborates on this idea by exploring notions of the sublime and its relation to experiences of both urban lighting and the night sky. Stone proposes a re-imagined nocturnal sublime that relies in part on ideas from environmental aesthetics that explore the moral significance of sublime experiences. The key idea is that sublime experiences of nature can make possible the conditions for an environmental ethic, as these are experiences that are humbling, and provide a viewpoint of the natural world from which we cannot put ourselves outside or above. The starry night sky, a paradigmatic example of the sublime, can do just that. Thus, there seems to be a possibility of sublime experiences fostering immanence ($S \subset O$) relations in Western thought, challenging rational transcendence and our technified, quantified conceptions of environmental sustainability.

10.7   Conclusion

In this chapter, we put many things together: the traditional LED debate and one alternative plea for the substantive value of darkness, one example of procedural values with the VSD methodology, and one model of comparative philosophy with

the Libbrecht model. It goes without saying that bringing together these three ideas, each of which is complex in their own right, was ambitious for a single chapter. However, we deemed it useful in our exploratory approach to show the complexity of applying comparative philosophy in energy policymaking. We are fully aware that the specifications are more or less arbitrary. That is to say that other substantive values could have been discussed, other procedural approaches could have been addressed and other comparative models could have been applied. Nonetheless, we perceive our approach to be a valid and useful one.

The short treatment discussed in this chapter also raised many questions that should be further tackled, especially for ethics and philosophy scholars. Questions are raised with regard to the nature of the relation among the three worldviews, on the one hand, and philosophies such as deep ecology (Naess 1973), social ecology (Bookchin 1988), Buddhism and Daoism, on the other (as currently practised in different parts of the world). Written in English, in a book building a rational argumentation, the Libbrecht model is also strongly embedded in rational transcendentism. Do people—users of a technology—who consider themselves more immanent or transcendent emotionalists feel represented by this model, does the model help them to voice their concerns, or do they still feel limited? For readers unfamiliar with the two other worldviews and their particular epistemological methodologies of direct experience and internal-mystical experience, this model—and a fortiori this short chapter—can only give a glimpse of what is 'on the other side', but it will not give a thorough comprehension needed to incorporate it into VSD for LED transitions. Although, hopefully, through discussing something more familiar (lighting and darkness), we are able to at least give a glimpse into alternative ways of approaching ethical problems.

We applied the Libbrecht model to the VSD methodology for the LED transition debate. In so doing, we described how the set of values in traditional VSD could be broadened to include the value of darkness. We showed how the implicit value of darkness shifts from rational transcendence to more to immanentism or emotional transcendence or to a deepening of the rational transcendence with the intrinsic values defined by Stone (2018b), and in particular via the role of the sublime (2018a). The application also adds to other literature arguing that VSD should further elaborate the normative stance of its methodology. This leads to a fundamental question in how far VSD itself is rooted in rational transcendence. One could argue that, as VSD focuses on clarifying personal values, it risks strengthening instead of weakening people's ego-intentionality. If so, can a more methodological application of the model 'correct' for the specific rational transcendence aspects?

Although we limited ourselves only to the LED policy debate, we draw the hypothesis that our above application can also be useful for other energy innovations. In all cases, both with LED lighting as with other innovations, the ideas presented here should be made more practical with more hands-on application. Further research or actual applications of VSD in energy innovations, such as the LED transition, will be able to more precisely consider how current values (such as safety and security) change, how the concept of the sublime can be helpful and what the role of by-itself-so or alter-intentionality will be. It will also be interesting to see

how these concretisations will take place in different places of the world. What will the effect be in China, for example, where transcendent emotionalism and immanentism were historically present, but where rational transcendence now seems to be pushed to its limits? How will actual VSD with the Libbrecht model decide on the sensitivity to darkness and on the reduction of the 24-h city? How and how long should the darkness be reduced? What balance of illumination and darkness should we strive for, and why? How will fighting crimes or legitimate nightlife businesses be involved in the process of decision-making, as well as the formulation of the substantive end goals?

Despite the emergence of a seemingly endless list of questions, we hope to have shown that attempting to tackle these is more than relevant. And we hope that our entire exercise in this chapter contributes to the overall goal of the responsible design of outdoor LED lighting and in turn, for other technologies.

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Chapter 11
Energy Justice and Construction of Community with a Shared Future for Mankind

Wang Guoyu, Jianing Guan, and Lei Li

Abstract The Western approaches on energy justice mostly link energy access to basic need and rights of individuals. These approaches are mainly based on the rights-justice theory of traditional political philosophy. Though Sovacool et al. (Applied Energy 142: 437, 2015) introduce the dimension of moral philosophy and ethical responsibility into the study of energy justice, their standpoint remains individual freedom, equality, and responsibility. However, energy issues are not only a matter of individual rights and responsibilities, nor are they only problems of the distribution and commitment of the accessibility and environmental consequences of energy consumption. From the very beginning, energy issues involve the issue of inter-subject relationships, involving both the responsibility of individuals and of collective subjects. Therefore, it is necessary to jump out of the traditional mode of thinking of individual rights theory and individual responsibility.

Based on the traditional Chinese philosophical ethical resources, mainly the Confucian thoughts on hexie (harmony) and yi (just), the "Tianxia" (world) view, and the reflections from the tradition of community both from the West and East, this article links energy justice to the construction of community with a shared future for mankind and puts forward that the foundation of energy justice lies in how to construct the relationship between the subjects (both individual and collective) of justice in the community with a shared future for mankind. Through cases of Yulin and global carbon emissions about energy justice, we propose a holistic perspective on energy justice inspired by the idea of the community with a shared future for mankind, and then point out that we should deal with the four major relations involved in the complete process of energy acquisition, distribution, utilization, and post-processing, in order to build a just energy system. Finally, we propose three possible strategies to deal with issues of energy justice, that is, specific strategy, real-time strategy, and holistic strategy, which may shed some light on the global issues of energy justice.

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Energy is the resource on which human beings live. With the rapid development of the global economy and the gradual decrease or even exhaustion of fossil energy, discussions on energy have already covered economy, technology, politics, military, and other fields and become an important issue in global politics. On the one hand, economic development and rise of people's living standard consume a large amount of energy, especially in developing countries such as China; obtaining and using energy has provided power and guarantee for production and development of economy, as well as great convenience for individual life. In the rural areas in the economically developed areas along the east coast of China, sufficient and diversified supply of energy solves the problem of clean energy in rural life in the past, and also promotes the development of individual economy. The popularity of private cars in urban areas, brought great convenience of travel for many more than middle-income families. However, for China, which has a large population and is dominated by fossil energy such as coal, oil and natural gas, its proven coal reserves reached 138.819 billion tons, and the output reached 3.523 billion tons, proven oil reserves reached 3.542 billion tons, and its oil output reached 192 million tons, proven natural gas reserves reached 5.52 trillion cubic meters, and its natural gas output reached 133.007 billion cubic meters in 2017. At the rate of extraction in 2017, coal will be available for about 39 years, oil for about 18 years, and natural gas for about 41 years (BP 2018; Ministry of Natural Resources of the People's Republic of China 2017b). A large amount of development and consumption of energy has brought great challenges to sustainable development. A large quantum of carbon dioxide emissions from the use of fossil energy is the most important reason for the emergence of urban haze. According to statistics, in 2017, there were 2311 day times of high-level pollution (the regional air quality index (aqi) ranges from 201 to 300 (including 300) for 72 consecutive hours) and 802 day times of severe pollution (the regional air quality index (aqi) ranges from 301 to 500 (including 500) for 48 consecutive hours) in 338 cities at or above the prefecture-level in China (Ministry of Natural Resources of the People's Republic of China 2017a), which had a great impact on public health.

The international community has been committed to global sustainable development. The United Nations commission on sustainable development, which was approved in December 1992, has done a great deal of work in this regard. Since 2004, it has paid more attention to the assessment and implementation of sustainable development goals and obstacles and has examined the progress of the implementation of "*Agenda 21*" and the "*Rio Declaration on Environment and Development.*" It has played an important role in promoting the eradication of poverty and the protection of natural resources and the environment. However, due to the multiplicity of the internal dimensions of sustainable development, countries always proceed from their own interests in the understanding of the content of sustainable development, so they cannot reach agreement on many key issues.

Energy and environmental problems have also attracted the attention of international academic circles. From the birth of environmental ethics to the concept of energy justice and climate justice, people defend sustainable development from different perspectives such as political philosophy, ethics, economics and international

relations, and try to find a theoretical way to solve energy justice. This article will attempt to examine the issue of energy justice from the perspective of the "community with a shared future for mankind." Starting from the concept of "harmony" in traditional Chinese philosophy and the concept of "World (Tianxia) system" proposed by Chinese scholar Zhao Tingyang in recent years, it will explore a Chinese approach to solve the problem of energy justice. The article will analyze the discussion about energy justice in recent years firstly and then expound the Chinese viewpoint of energy justice which is based on Chinese harmonious thought.

11.1 Existing Research Approaches to Energy Justice

The term "energy justice" was first used in academic research in 2010. The second article in 2013 focused more on ethical consumption, and the "Energy Justice in a changing climate" published in 2013, focused more on climate change. None of these documents seriously defined the concept of energy justice. Since 2013, energy justice has gained more attention and become a research object. From early 2013, the concept came into being (Heffron and McCauley 2017). Scholars mainly aimed at justice problems of obtaining or distribution in the use of current energy (mainly the traditional fossil energy), as well as the carbon dioxide emissions involving responsibility assignment, problems of energy use, etc. In general, the research approaches can be summarized as follows: right justice theory, procedural justice theory, and responsibility justice theory.

11.1.1 The Approach of Right Justice Theory

The early studies of energy justice mainly focused on the energy access of "vulnerable groups," emphasizing that every individual, regardless of gender, region, race, and class, has the right to access energy to ensure basic food, clothing, and health. With the development of energy justice research, Diana Hernandez believes that a full view of energy justice must take into account the complete spectrum of issues from production and distribution to ethical consumption and government regulation (Hernández 2015). Benjamin K. Sovacool and Michael H. Dworkin defined energy justice as a "global energy system" (Sovacool and Dworkin 2014). Energy justice is no longer limited to the accessibility of energy problem but also pays attention to the whole chain of energy utilization, all participants on the benefit and harm of justice, in a more systematic view that concerns justice problems in energy use. Benjamin K. Sovacool et al. further expanded the rights guaranteed by energy justice and injected new connotations such as happiness, freedom, equality, and due process (Sovacool and Dworkin 2015).

Many other scholars have studied the justice of the distribution of energy as resources and the distribution of energy-related benefits and damages from the per-

spective of distributive justice or studied the "recognition justice" in which special groups are known, recognized, and respected, the essence of which is still to emphasize the satisfaction of individual rights. This research approach mainly put forward that the realization of energy justice should make use of regulations, laws, and other rights to guarantee equality or distributive justice and guarantee the realization of individual equal rights through procedural justice. Wan Junren, a Chinese scholar, proposed to elevate energy rights to basic human rights and realize energy justice from the aspect of human rights protection (Guanghui and Junren 2015).

11.1.2   The Approach of Procedural Justice Theory

Procedural justice is regarded as one of the core principles of energy justice, or even a part of energy justice. It is not only the goal and principle pursued by energy justice, but also the specific means and methods to achieve energy justice. Procedural justice is mainly reflected in the formulation of energy policies. Attention should be paid to the right of participation, information, and supervision of different levels and groups to ensure that their interests or basic energy needs can be guaranteed in practice. Kirsten Jenkins and Darren McCauley believe that procedural justice is underpinned by access to and pressure from multi-level legal systems. It is also driven by softer nonregulatory influences such as practices, norms, values, and behaviors. Therefore, they propose to strengthen mobilizing local knowledge, such as the local ecosystems and cultural habits, which is of practical significance for subsequent effective consultation and representation. They also raised the importance of information disclosure and suggested that the representation of institutions be strengthened (Jenkins et al. 2016).

11.1.3   The Approach of Responsibility Justice Theory

Although it is still difficult to define the responsibility distribution of environmental degradation caused by the emission of carbon dioxide due to the use of energy, it has attracted more and more attention and discussion from scholars. Benjamin K. Sovacool and Michael H. Dworkin believed that the distribution of responsibility for environmental and social hazards should be associated with energy production and use without discrimination (Sovacool and Dworkin 2015). Kirsten Jenkins et al. further emphasized the importance of responsibility in energy justice, and presented that responsibility should go beyond individual responsibility and focus on the responsibilities of NGOs, companies, and government and other groups (Jenkins et al. 2017). At present, some governments implement the policy of "carbon tax" to "regulate" the limited groups or major groups, which is the specific practice of the responsibility distribution of carbon dioxide emissions. However, in the global context, there have not been consensus and universal agreement and regulation, and the scope of practice is also very limited.

In addition to the above typical and systematic research approach, Kirsten Jenkins and Darren McCauley, etc., believe that the more pronounced "systems" thinking of energy justice is needed, and a combination of the social science account of energy (policy) with its natural science counterpart (systems) should be advocated (Jenkins et al. 2016). This is very consistent with the global and complex nature of energy use and its interdisciplinary nature. Raphael J. Heffron, Darren McCauley, and Benjamin K. Sovacool argue that the government is facing a trilemma of energy policy, and that the "trilemma" is a high-profile summary of the many areas of energy: economy, politics, and environment. They also propose measures of energy justice, hoping to use economic models to develop a concept that can calculate costs and produce results that are easily understood by the public, creating a balanced triangle between the "trilemma" that goes beyond the economy-led pattern of the past (Heffron et al. 2015). This is the first time that quantitative analysis has been applied to the study of energy justice. This quantitative analysis method undoubtedly provides important reference data for the realization approach of energy justice. More importantly, it seeks to solve the contradiction between energy utilization and environmental protection from an overall perspective.

Most of the above studies on energy justice relate the acquisition or distribution of energy to the basic needs and rights of individuals, and the research approach is mainly from the terms of individual freedom, equality, and responsibility. However, energy justice is not limited to individual rights and responsibilities, also is not only the accessibility of energy and the distribution and bearing of the environmental consequences, it also involves the contradiction between human development and environment deterioration, the contradiction between individual rights and the interests of the whole human and the contradiction between contemporary and future generations in energy use and environment, etc. Energy justice is a systematic and holistic problem involving the interaction between human and nature, individual and individual, and individual and society. Therefore, it is necessary to break away from the traditional thinking mode of individual right theory and individual responsibility and seek a new solution approach for the realization of energy justice from the perspective of the whole human existence. This paper argues that the concept of the "community with a shared future for mankind" provides a systematic and holistic perspective for the discussion and settlement of energy justice issues.

11.2 What Is the Community with a Shared Future for Mankind?

In the Western academic circles, the pursuit of the community is nothing new. As American scholar Philip Selznick pointed out, "Many thinkers - Hegel, Marx, Dewey, and so on, including several popes—have looked for possible choices, in their view, to use communitarianism instead of a depletion of the morality, and the lack of understanding of human society (Selznick 2009)." These big thinkers have a lot of discussion about the community, but if you want to trace the concept of the

community, Aristotle in ancient Greece should be the earliest advocate of the community. Both Hegel and Marx were inspired by Aristotle's *Politics*. It can be said that the communitarian tradition of "Aristotle-Hegel-Marx" is an important source of thought in contemporary Western communitarianism (Yitian and Weijie 2013).

As early as in the era of ancient Greek city-state politics, Aristotle pointed out in his *Politics* that human beings are political animals in nature. Anyone who is not part of a state "must be either a beast or a god." All in all, not people. Here, Aristotle's "city-state" is a political community. Aristotle's argument for the social and political nature of man is carried out along three lines of thought. First, the holistic approach is to think that the whole is ahead of the part and the whole is bigger than the individual. He believes that, in terms of nature, all must precede the part, and the individual must be in the community. Second, non-self-sufficiency of the individual. In Aristotle's view, each individual is not self-sufficient. It is difficult to satisfy all the needs of self-survival by his own strength. Only living together in the city-state, everyone's needs can be maximally satisfied with each other. Third, the pursuit of a good life. Aristotle pointed out that although the emergence of city-states is the natural development of human life, the life of everyone in the city-state can be fully self-sufficient, but the existence of city-states is not only to satisfy people's survival, but for "excellent life"(Aristotle 2009). This is another characteristic that distinguishes people from animals, that is, people organize themselves for the purpose of living a good life.

Aristotle's view of the priority of the community is repeated in Hegel as a part of his dialectics. In the book *Elements of the Philosophy of Right*, Hegel explicitly criticizes the atomic individuals portrayed by modern social contractarian and advocates the concept of an ethical entity. Hegel argues that the state should be the reality of ethical ideas, and the ethical idea is what McIntyre calls "the customary morality of every particular society" (MacIntyre 1984). The practice and cultivation of this customary morality constitute a "second nature" (Hegel 2009) that is different from our natural nature. According to Charles Taylor, Hegel's doctrine of placing ethics (German, Sittlichkeit) at the top of moral life must have a social concept of living as a broader community (Taylor 2009), and individuals must exist as a member of the community. In this way, ethics means the moral responsibility of the individual to the real society in which he lives. Individuals can only obtain a complete moral existence within the community, and the individual is within the community. Therefore, only when a country is a reality of ethical ideas can it be an ethical entity, a community in the Hegelian sense.

On the basis of Aristotle's and Hegel's arguments, Marx further refined and developed the relevant community thinking. Marx and Engels pointed out in *The German Ideology*: "Only in the community, individuals can obtain the means to fully develop their talents. That is to say, only in the community can there be individual freedom (Marx and Engels 2009a)." By placing individuals in the community among them, our understanding of the individual has undergone a substantial change. The individual is not "Robinson on the island" (Marx and Engels 2009b), but the person within the established historical conditions and social relations. The essence of human beings is understood as the sum of social relations. Therefore, in

Marx, the perspective of unloaded self and individualism is no longer the first place in terms of how to look at the nature of human beings. The community becomes the big premise of our understanding of individual rights, freedoms, and living conditions.

In the context of Chinese thought and culture, we can also discover the germination and development of the thought of community. First of all, the traditional Chinese society is a community life form based on the blood patriarchal system. Under the situation of agricultural production and life based on blood patriarchal system, people follow a kind of ethical requirements, such as "to be benevolent love the benevolent man loves others" (Meucius 1970) (*Mencius • Lilou*), "you yourself want position, so you give position to others; you're yourself want to advance, so you advance others"(Confucius 1998), and "what he himself does not want, let him not do it to others"(Confucius 1998). Secondly, the traditional Chinese culture as represented by Confucianism has the civilized tradition—"the nearest is happy, the distant is coming," the community consciousness of good neighborliness and friendship, and the concept of world peace and human consciousness. This unique "world (Tianxia)" view of Chinese civilization is the earliest and most systematic philosophical view of the world from a holistic perspective. The holistic perspective from Chinese traditional philosophical thought is very different from the Western holistic idea which emphasizes that the interests of the whole are greater than the sum of the interests of the individual, and the interests of the individual are based on the status and role of the individual, while the Chinese holistic perspective generally emphasizes the harmony of the relationship between the individuals in the whole. The ancient Chinese people have long believed that: "the world is not the world of a certain person, but the world of all the people. The Yin and Yang are consistent, not only grow one species. When the nectar rains, it is for all the people under the heaven. The Emperor of the people does not favor one person." (Shuangdi 1986). The ancient Chinese called the "world (Tianxia)" to imagine China's Central Plains in terms of geography, at that time entire "China." However, from the perspective of the whole country, the ancient Chinese thoughts analyze and deal with the whole world. The problems faced by mankind together show the visions of the awareness of a world community with a shared future and the whole mankind. It advocates the concept of "when the great way is followed, all under heaven will be equal," the symbiosis of the world, the harmonious idea of the world, and still has positive contemporary values today (Rui 2018).

"The community with a shared future for mankind" is a concept with extremely rich political and philosophical connotations. According to Susan Love Brown, the community is a complex concept—a social group with a common cultural and historical heritage or a group that shares character and interest and lives with them is distinguished by the larger group. Community is also a sign that abstractly connects with other aspects—what is shared in a spiritual community, although sometimes it is transitory. This means the community will cross boundaries such as space and time, and let our understanding embrace those unrestricted connections: common history, common practice, common understanding, and common identity, which

seem to be ubiquitous, regardless of where we go, or what we do. In this way, the community seems to have no boundaries, because we can imagine a human community: "it encompasses all human beings from the beginning of human existence to the end of human existence (Brown 2002)." That is, if the concept of the community is defined from different perspectives, its extension can be very different, including small to family, large to all mankind. Conceptually, the concept of the community, at the lowest level, that is, what is shared between different actors or human beings? This sharing can be language, culture, customs, beliefs, etc. At the highest level, it is the strong bond between the human beings who are intimate, or the spiritual or spiritual bond formed between them. And between the lowest level and the highest level, there is also an intermediate level, that is, the sharing of benefits or the sharing community. Chinese scholar Gong Qun believes that the "community with a shared future for mankind" should be regarded as the largest community in the extension of the concept. It emphasizes that different countries and nations live together on this planet, and they have a life-and-death relationship. The emerging high technologies provide more possibility to the global economic integration, cooperation, and development, and we have seen quite some experiments in this perspective. However, we still have many challenges to face, like the challenges in the field of energy justice. Countries have gradually formed a blending pattern of interests among you and me. Therefore, the fundamental criterion for building the community with a shared future for mankind is the principle of justice (Qun 2018).

11.2.1 *International Justice*

Justice in the contemporary world from the perspective of the community with a shared future for mankind involves international justice, universal justice, and environmental justice. As far as international justice is concerned, it refers to a community built on the basis of state-to-state association, adherence to the principle of sovereign equality, respect for all nation-states, different cultures, and civilizations. This community is based on the premise that all local human communities are respected and developed, that is to say, it is a community that can be constructed under the premise of fully respecting the autonomy, independence, cultural individuality, and civilizational characteristics of different nation states. On the other hand, we must recognize the profound inequality between developed and developing countries in economic and trade exchanges in terms of economic justice. This wide and profound inequality is caused not only by historical factors, but also by actual differences in the level of scientific and technological development and the formulation of economic order rules. The vision of a community with a shared future for mankind includes such concepts as "shared interests" and "win-win cooperation" in the economy. The community with a shared future for mankind inherently contains the concept of the equality of economic rights, and the contemporary

world economic development as well as the rules of the world economy shows that this right between developed and underdeveloped countries is not equal; therefore, to strive for a fair justice of economic environment is one of the most important missions of building the community with a shared future for mankind.

11.2.2 Universal Justice

Universal justice in the vision of the community with a shared future for mankind involves every human individual or every human being and regards every human being in the world as a basic or ultimate unit of concern. Every human being is not only a member of a nation-state community, but also a member of the community with a shared future for mankind in a sense that transcends the nation-state community. In this regard, every human individual has the membership of the human community and thus enjoys the basic rights of membership. In other words, to guarantee the basic human rights of every human being, as well as human dignity and equality, is the basic requirement of universal justice and the fundamental requirement of building a community with a shared future for mankind. "For every human individual, as the ultimate unit of moral concern, there is a global moral stature (Pogge and Kant 2010)." To regard every human individual as the ultimate unit of moral concern is to treat every individual equally, which means to regard all individuals as equal individuals and emphasize that everyone's interests should be considered equally.

11.2.3 Environmental Justice

Environmental justice in the vision of the community with a shared future for mankind is a just condition for the existence of the community with a shared future for mankind on earth. Environmental justice includes two aspects. The first is the destruction, plunder, and pollution of the earth's environment caused by human activities, which leads to the justice of human's relationship with the environment. Second, the destruction and pollution of the earth's environment and the greenhouse effect by countries in different regions have raised the issue of justice in governance. All human beings live together on the earth, the only home of human beings. The earth carries human beings, and its ecological environment is the destiny of human beings. At the same time, the development of human history to such a historical period, the whole of mankind as a community to build is not only the need for common development of mankind, but also the common development of the inevitable choice. It is the sacred mission of mankind to build the community with a shared future for mankind and jointly build a better earth.

11.3 Energy Justice from the Perspective of Community with a Shared Future for Mankind Applied to China

Community with a shared future for mankind is not only a beautiful philosophical idea and concept, but also plays a role in guiding the implementation of energy justice or policymaking. The following part will start from the relationship between energy justice and the community with a shared future for mankind and take the domestic and international challenges currently faced by energy justice as examples to discuss the possible solutions to energy justice from the perspective of the community with a shared future for mankind.

In fact, even in the history of Western philosophy, the concept of justice from the perspective of community or overall harmony has a long history. In the history of Western philosophy, justice has been the core concept of philosophical ethics since ancient Greece. In Plato's view, justice is regarded as a kind of order law, and the embodiment of this order law in the city lies in the three professions of the city: ruler, soldier, and ordinary laborer have corresponding different virtues in different positions, each in his proper place and each in his duty, so as to ensure the harmony of the whole operation of the city. Plato said, "a city was thought to be just when each of the three natural classes within it did its own work" (Plato 1997). That is to say, justice is consistent with the overall harmony of the city-state as a community. Aristotle inherited and developed Plato's thought. On the one hand, starting from the political animals characterized by social groups, Aristotle regarded the interests of the city as the place where justice is based, and believed that justice is "to live together in self-sufficiency, to achieve equality through proportion or to be equal in quantity" (Aristotle 2003). On the other hand, he points out that justice is not only of overall significance, but also related to individual interests, including honor and wealth. In the distribution of these benefits, there is inequality, that is injustice. Therefore, justice consists in the distribution according to the corresponding contribution, in proportion to the distribution, the distribution not in proportion is injustice. Justice here contains the meaning of equality and fairness.

Although there is also a holistic interpretation of justice in the history of Western philosophy, it is quite different from Chinese philosophy's interpretation of justice from the perspective of relational justice. In China, the thought of "justice" is a further development of the thought of "yi," which plays an important fundamental role in the traditional Chinese moral value system and moral practice. In ancient Chinese, "yi" was the same with "appropriate," means "appropriate for people." The traditional characters "yi" and "appropriate" are both interpreted as "appropriate morality, behavior or reason" (Shen 2015). The explanation of "yi" in the *book of Rites · Mean* is concise and comprehensive. "Yi" means "appropriate" and "should." Xunzi also grasped the appropriateness of "justice" from a rational, reasonable, and appropriate dimension, and for the first time combined "yi" with "justice." Justice emphasizes the individual virtues, especially the individual virtues of a gentleman or a politician. However, justice is not only about personal morality, but also about the public morality of properly and appropriately handling various social relations,

international relations, and relations between mankind and nature (Guiyan and Jinyang 2016). Sor-Hoon Tan's points out that the concern of "yi" is "overwhelmingly about the effect of actions on specific interpersonal relationships, actual or potential" (Sor-hoon 2015). Chinese scholar Zhao Tingyang also put forward that, "we call the principle of legality of expressing interpersonal relationship justice, which is similar to the traditional Chinese concept of 'yi'" (Tingyang 2009).

The interpretation of "yi" or "justice" from the perspective of relationship in Chinese philosophy is exactly consistent with the multidimensional concept of "relationship" contained in the "community with a shared future for mankind." At the same time, energy as the material basis for human survival and development bears on the common destiny of all mankind. Therefore, it can be said that energy justice and the concept of the "community with a shared future for mankind" have intrinsic commonality in theory and external homogeneity in reality. To examine the justice issue common to all mankind in energy utilization from the perspective of "community with a shared future for mankind," we need to deal with the following relations.

11.3.1 The Relationship Between Economy, Safety, and Environment

The economic, security (politics) and environmental aspects of energy utilization are considered to be the "trilemma" by some scholars. Economic development and energy utilization are in positive growth. Economic development is the trend of human history and the goal pursued by mankind. Energy is the indispensable propellant of economic development. However, with the growth of economic development's demand for energy, the use of energy presents an imbalance, which often leads to a country's energy not being able to meet its development needs. The global nature of energy utilization becomes increasingly prominent, and the interdependence of energy utilization brings about national security or political problems. At the same time, the utilization of energy, especially the carbon dioxide emitted by burning fossil fuels, has brought serious environmental problems. How to balance the relationship between these three parts is the primary problem of energy justice.

11.3.2 The Relationship Between Individual's Energy Needs and Mankind's Needs/The Mankind's Need for a Clean Environment

The utilization of energy ensures individual food and clothing, improves the quality of life of individuals, these being crucial for every individual on the earth. However, as a relatively scarce resource at present, the amount of non-renewable energy

represented by coal and oil is decreasing year by year. In addition, due to limited technology and cost, new energy has not yet reached the level of large-scale utilization and complete environmental protection. From the perspective of humanity as a whole, the consumption of energy by some individuals is bound to reduce the use of energy by others, especially future generations. At the same time, the accumulation of individual energy utilization has caused environmental damage, which also contradicts with the human need for a clean environment.

11.3.3   The Relationship Between Mankind's Need for Energy and the Balance of Nature

Mankind is a part of nature, and energy is also a part of nature. As mentioned above, mankind and energy are symbiotic and equal. However, human's use of energy, especially fossil energy, is a plunder of nature, which destroys the balance of nature and violates the ancient Chinese concept of "unity of man and nature." Take Yulin in northern Shaanxi, China as an example. Yulin's economy is resource-based. In the twenty-first century, with the rapid economic growth, the strong demand for energy market drives the rapid development of Shaanxi's energy industry. It is estimated that 150 million tons of abandoned soil and slag are discharged from the exploitation of oil and gas fields in northern Shaanxi, with an annual increase of 18 million tons of soil and water loss. In Yulin, 17,300 hectares of vegetation have been destroyed and 20,000 hectares of land have been degraded due to wind erosion (Huiqin 2010). These lands have been unable to grow food crops, brought the local agricultural and ecological environment great impact. This also shows that the destruction of nature by human beings also brings crisis to the survival of human beings themselves.

11.3.4   The Relationship Between New Energy Development and Traditional Energy Utilization

Although the current utilization of new energy is still in the primary stage, but almost all mankind agrees that new energy in the future will replace traditional fossil energy and actively develop new energy. However, countries can largely differ not only in their resources, economy, science, technology and legal conditions, but also in their layouts of the old and new energy as well as development. Combined with that situation, the development of new energy and the replacement of traditional energy in the future may bring about indirect justice problems such as pollution and serious umemployment; therefore, we should not promote the progress of new energy all at the same pace.

Good to deal with above relations, first of all, we should think energy acquisition, distribution, utilization (consume), and post-processing (carbon) as a complete process, rather than to simply emphasize one link in the realization of justice, then put this process under the vision of community with a shared future for mankind, make "harmony" as the goal and method, from the perspective of "world system" of the overall balance of these relationships, refactoring the value system of energy justice.

In the case of China, let us start with a look at the country's energy situation and the challenges it faces. China's natural geological conditions determine the characteristics of its energy base, that is, complete energy mineral resources, but less per capita ownership, uneven distribution, and backward resource structure. To be specific, China's natural resources are unevenly distributed among the provinces. Taking Yulin area of Shaanxi province as an example again, the unreasonable and predatory development of Yulin's resources has aggravated the destruction of ecological environment, making the contradiction between population, resources, and economic development more and more prominent. From the perspective of energy justice, the causes of the lack of energy justice in Yulin region can be summarized as follows: first, the regional difference and differentiation of energy distribution are the structural premise of the lack of energy justice in this region. Differences in energy distribution will affect land development and regional development. The uneven regional distribution of energy has a direct impact on the development of resource-based industries, and thus leads to the differences in the distribution of resource-based industries in China's east, central, and west regions. The eastern region is a major energy consumption region, and the central and western regions have become the center of China's energy production. The east is not paying higher costs for consuming a lot of energy, and the mid-west is not implementing a resource proliferation program to protect the environment. The problem of unbalanced regional supply and demand of energy is prominent, which has resulted in a more significant deterioration of inter-regional relations of resources. Second, the economic and environmental effects of industrial development are not good enough. Many resource-based regions fail to truly get rid of the strategic constraints of energy development, and the interest compensation mechanism fails to play an effective role, making the output of energy raw materials in a low value-added way. Third, the interest distribution mechanism and fiscal and taxation policies of energy are unreasonable. In the distribution framework of energy benefits, enterprises represent the state to occupy and obtain the most part, and the central government gains profits through taxes and fees and the most important profit sharing. Local governments, on the other hand, mainly collect taxes and fees to obtain their own income. As a result, there will be an imbalance in the distribution of interests between state-owned enterprises and local governments, between enterprises and local residents, and between the places where energy is exported and imported, which makes it difficult for energy advantages to be transformed into local economic and financial advantages. Finally, ecological compensation mechanism is missing. For decades,

China's resource-rich western regions have been sending resources to the developed regions, but the developed eastern regions have not given enough compensation to the western regions. To some extent, this way of economic development, which involves the predatory development of energy resources and the transfer of ecological crisis, is at the expense of underdeveloped regions. Addressing the observed energy injustice in Yulin energy region requires the institution and strengthening of community consciousness and acting in unity with nature including maintaining corresponding responsibilities and obligations and appropriate ecological compensation mechanism. These will be necessary to ensure regional harmony and improved ecological environment.

Another case of energy justice is the issue of global carbon emissions. If in the 1970s and 1980s energy security meant ensuring adequate supplies of oil at low prices, today, it covers broader issues beyond oil supply. Energy is linked to economic development and other global issues such as climate change (Cherp and Jewell 2014). In the area of global energy governance, the first and most important change is linked to the issue of global climate change and "carbon reduction" in the global economy. Energy production and consumption are the biggest sources of greenhouse gases, accounting for nearly 70% of global emissions (International Energy Agency 2014). World carbon emissions continue to rise because countries and markets change slowly. There is a power imbalance between carbon emissions and climate change. Developed countries have historically enjoyed the benefits of climate-damaging economic activities, while at present it is mainly developing countries that bear the consequences of climate change. It was the historical emissions of developed countries that caused the current climate change problem, but now, developed countries will gain new institutional powers because of their participation in global governance of climate change. This injustice is double. The historical emissions of developed countries have given rise to the political and economic advantages that they dominate the world today, and will give rise to new political and economic advantages now, such as new energy development, carbon markets, and low-carbon technologies, in response to climate change (Laihui 2016). Today, the world is already in the age of Anthropocene, man-made climate change has posed a serious threat to the earth and human civilization, and carbon emissions have become as destructive as nuclear weapons. Therefore, we need to construct a community with a shared future for mankind under the guidance of such a holistic concept, with the mission of jointly building a better earth. China has taken a series of corresponding actions, such as carrying out carbon trading pilot projects in seven provinces ·and cities, including Beijing, to gain experience in exploring ways to form a national carbon market from the bottom up. These measures have achieved positive results in energy conservation and emission reduction. In 2016, China's energy saving accounted for 60% of the world's total energy saving. China accounts for 61.3% of the world's total carbon emissions reduction (Jieyu et al. 2019).

Through the above two cases at the domestic and international levels, we believe that energy justice involves international justice, universal justice, and environmental justice from the perspective of the community with a shared future for mankind.

First, from the perspective of international justice, in the process of energy development, production, and consumption, countries should adhere to the principle of sovereign equality, respect and accommodate the different cultures of different countries, and respect the independence of nation-states. In terms of economic justice, there are profound inequalities between developed and developing countries, and the concept of the community with a shared future for mankind also includes economic "benefit sharing" and "win-win cooperation," namely, the equality of economic rights. Second, from the perspective of universal justice, every human being in the world, as a member of the community with a shared future for mankind, is the most basic and ultimate unit of concern, and thus enjoys basic rights as a member. Therefore, in the aspects of energy development, production, consumption, benefit distribution, and ecological and environmental risk taking, we need to treat each individual equally, and everyone's interests should be considered equally. Thirdly, from the perspective of environmental justice, we need to pay special attention to the issue of human's environmental justice and environmental governance justice. All human beings live together on the earth, the earth is carrying human beings, and its ecological environment is the fate of mankind. Therefore, jointly building a better earth home is the sacred mission of contemporary mankind.

Specifically, China was still the world's largest energy consumer, accounting for 23.2% of global energy consumption in 2017. It can be said that China is a real energy giant. As a very large developing country, China's energy use has a sharp contradiction among economy, security, and environment. China's rapid economic growth has increasingly increased its demand for energy. In 2017, China's energy consumption increased by 3.1%, ranking the top in global energy growth for seventeen consecutive years and accounting for 33.6% of global energy consumption growth. At the same time, China's own energy storage and development cannot meet the needs of the economy, and the external dependence of energy is increasing year by year. In 2017, the external dependence of petroleum was 68.52%, which reached the highest level in history at that time, and the external dependence of natural gas also reached a new high, reaching 37.93%. Rising energy dependence has become a potential threat to China's national security. China's resource endowment is characterized by "rich coal, poor oil and little gas," which determines that China's energy use is dominated by coal. In 2017, coal accounted for 60.42% of China's energy consumption, and coal combustion is the main source of carbon dioxide emissions. Therefore, the environmental problems caused by coal-dominated energy use are increasingly prominent (BP 2018).

We are facing a "policy trilemma" in how to implement the principles and requirements of energy justice in global energy governance, namely, how to ensure energy supply, protect global climate, and reduce energy poverty, especially in developing countries (Cherp and Jewell 2011). How to balance security and environment with economic development is also the primary problem in China's current energy utilization. Starting from the concept of community with a shared future for mankind, there are several strategic principles for constructing a just energy system.

First, specific strategy. In other words, we are required to analyze specific problems on a case-by-case basis and determine specific energy development policies according to different regions, energy distribution, and energy consumption. At present, China's oil and natural gas consumption has reached a high level of external dependence, and the development trend of renewable energy is getting better. However, limited by the level of scientific and technological development, China's utilization capacity of renewable energy is still very limited. In 2017, China's non-fossil energy accounted for 13.56% of the total energy consumption. The above situation led to that China cannot follow the successful energy utilization mode of some countries. China is abundant in resources endowment of coal which will be still the main body of China's energy consumption in a long time. In a certain period of time. China can't, like other countries, cancel or reduce the massive coal use or transition to "oil era." China should, according to their own resources and development, reasonably layout the energy structure, problem-oriented management, rather than blindly following the energy path of other developed countries.

Second, real-time strategy. In other words, it requires us to assess the situation, make an immediate assessment and judgment on the specific situation of energy development, and adopt an open and dynamic attitude to timely adjust the energy development strategy. As mentioned above, to determine the dominant position of coal in China's energy use, it is necessary to address the existing problems in current fossil energy, especially coal utilization. At present, the main problems existing in the utilization of traditional fossil energy (including coal) in China are low efficiency of development and utilization, low level of scale, serious waste of resources, and low efficiency of conversion and utilization, and the proportion of high-quality energy in terminal energy consumption is low. The regional distribution of energy resources is different; many economically developed areas are energy poor, and the reverse distribution of energy production and consumption seriously affects the rational allocation and efficient use of energy. Based on these factors, China first needs a large amount of investment in science and technology to improve the efficiency of the use of fossil energy and clean use of fossil energy.

Third, holistic strategy. In other words, the whole process of energy development, production, and consumption involves stakeholders at different levels. Therefore, when it comes to major issues related to individual or human interests and basic principles, the interests of different stakeholders should be ensured based on the holistic interests of mankind. If the community with a shared future for mankind embodies the idea of a "great society," then the members of the community should not only reach consensus on the community, but also achieve substantial common development. Such development is not spontaneous, and it cannot be achieved without the coordination of entity organizations at a higher level. A more prominent problem in China is the imbalance between urban and rural development, which is particularly evident in the use of energy. At present, in some China's rural areas, energy access is relatively backward. Combined with the current trend, the energy utilization should be based on local conditions and local materials in China's rural areas in the future, for example, adopt the method of distributed solar energy

and biomass energy supply system. At the same time, limited to the level of rural economic development and science and technology, the national government must play a coordinating role, through policy guidance, in the form of subsidies and macroeconomic regulation and control.

11.4 Conclusion

In the process of the current global energy development, production, and consumption, seeking for the ethical principles which are out of economic and technological means, and seeking for the sustainable development of mankind become the most pressing needs. Based on the traditional Chinese ethical resources and the reflections on the tradition of community, this chapter links energy justice to the construction of community with a shared future for mankind and puts forward that the foundation of energy justice lies in how to construct the relationship between the subjects (both individual and collective) of justice in the community with a shared future for mankind. Through cases of Yulin and global carbon emissions about energy justice, we propose a holistic perspective on energy justice inspired by the idea of the community with a shared future for mankind, and then point out that we should deal with the four major relations involved in the complete process of energy acquisition, distribution, utilization, and post-processing, in order to build a just energy system. Finally, we propose three possible strategies to deal with issues of energy justice, namely, specific strategy, real-time strategy, and holistic strategy, which may shed some light on the global issues of energy justice.

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Part IV
Theoretical Approaches in Energy Justice Across Borders

Chapter 12
On the Concept of "Energy" from a Transcultural Perspective

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Abstract This chapter gives an overview of the concept of energy from a transcultural perspective. Often, energy is only approached by means of the stipulative definition as used in science. This usage disregards the specific philosophical origins of the concept. In the comparative philosophy of Ulrich Libbrecht, the concept of energy is used as a comparative category, which has related concepts in each of the various ideal types of worldviews—the Greek, the Indian, and the Chinese—his comparative model describes. By informing ourselves of particularly Buddhist and Chinese perspectives on energy and ethics, we can transform and expand our understanding of energy, in order to increase its explanatory power, with regard to contemporary questions of energy justice. This includes a posthuman approach towards it.

12.1 Introduction

This volume is aimed at an active engagement with energy ethics from a cross-cultural perspective. This chapter engages with the concept of energy on the most fundamental level. When we engage with the concept of energy from a cross-cultural perspective, this might lead to a deconstruction of some of our assumptions about it. This chapter will try to give an overview of the fundaments of the concepts of energy from different cultural starting points, while being inspired by the comparative approach of Ulrich Libbrecht to understand energy as a cross-cultural comparative philosophical category to understand philosophical difference.

When we engage with the ethics of energy, our enquiries are grounded in our imagination of the concept of energy. Energy can be approached in two ways, either

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as a physical and defined given, based on the laws of thermodynamics[1], or as a philosophical and open question. The way, however, how we imagine the meaning and reference of the concept of energy, already has ethical implications. How we understand the world and our ethical commitments can never be detached from each other. Regarding energy ethics, I propose we won't focus too much on the physically defined approach to energy and instead survey what is at stake when we survey energy as a philosophical open question. The definitional approach to energy is used for functional applications. But to understand energy from an ethical perspective, we need to see how it is embedded in broader frames and worldviews.

Energy is predominantly an ethical problem if it is understood as limited or if access to it is restricted. As a scientific and economic given, energy is indeed seen as both limited and its access restricted. This "applied" concept of energy is very different from its philosophical roots, which appears to understand it much more as an unlimited force. Ulrich Libbrecht's method has been precisely to use the concept of energy as a cross-culturally relevant philosophical principle. When we look at the environmental crisis of today as it is related to the energy crisis, it is ironic to see that though we believe that energy it is actually abundant. The real energy crisis is not a material dependence on fossil fuels as a source for energy, but a crisis of imagining a source of energy which taps into the philosophical understanding of energy. In a sense, even our imaginations of "sustainable" energy sources, such as wind, solar, hydro-, and biomass, still rely on a limited perspective on energy, in which energy is "measured" and "calculated" and in which the industries necessary to extract this energy still rely on scarce resources. The stipulative understanding of energy, which presents it as an unquestionable scientific given, might not be sufficient if we want to engage with deeper and ethical question in light of the ecological predicament and energy justice. It is therefore important that we imagine energy beyond the quantifiable concept as how it is often presented to us. Libbrecht's comparative philosophy starts from the philosophical open concept of energy. In this chapter, I will briefly survey his cross-cultural understanding of energy and relate it to energy ethics, to show how it helps understanding energy in a way which offers a more integrated and holistic approach to energy justice. Since energy justice is a global issue, it is important to take into account wider diversity worldviews.

12.2   Libbrecht and Worldviews

Ulrich Libbrecht (1928–2017) was a Belgian philosopher, who can be placed in the universalist school of comparative philosophy. This school assumes the possibility of designing a philosophical model to encompass all different philosophies of the world.

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[1] All definitions appear to include a reference to the "ability to perform work" and the property of "transference," in line with the first and second laws of thermodynamics. Wikipedia's current lemma starts with "energy is the property that must be transferred to an object in order to perform work on, or to heat, the object." For discussion, we refer to Lehrman (1973).

This possibility was later questioned by representatives of the hermeneutical school of comparative philosophy, who assume that any comparative philosopher is always reflecting on different philosophies from a particular hermeneutical perspective and would need to take this perspective into account (van der Braak 2014). One of the reasons that Ulrich Libbrecht was attracted to a universalistic approach to comparative philosophy was that he was trained as a mathematician (before finishing a PhD in Sinology in Leiden) and was strongly influenced by the Belgian philosopher Leo Apostel.[2] The project of Apostel can be seen as a rational-universal approach to philosophy, which attempted to unite metaphysics, logic, and ethics in an overarching collection of what he called *worldviews* (Apostel and Veken 1992). Any *worldview* is the idea a human being or human beings have about the world in which they live. It includes a set of assumptions about how the world in which we live is constituted. These assumptions are both descriptive and normative. Worldviews provide human beings meaning in life. Worldviews can change, and everybody has them. According to Apostel and Veken (1992), the plurality of worldviews and the encounter between them would ultimately lead to a merging of worldviews, which would result in a more correct understanding of nature and reality, and of the meaning, value, and ethics worth striving for. Ulrich Libbrecht entered this project from the approach of a sinologist, who was well acquainted with the non-Western worldview of Chinese culture. This added a comparative dimension to the worldviews project.

Libbrecht's model of comparative philosophy starts from two fundament concepts: *energy* and *information*. According to him, these can serve as "comparative foundations", since every philosophy has concepts which are similar to these concepts (Libbrecht 2007). Each philosophy expresses a worldview, a view of the world. The particular form of this worldview, this tradition, or this religion is what Libbrecht (1995) calls the "surface structure" or the worldview. How it is expressed, in which forms it is expressed, etc. This surface structure is culture dependent and variable. This is opposed to "the world" or the "real Reality" that is beneath these phenomenal worldviews. This is the "depth structure" of all worldviews. Libbrecht often uses the metaphor of the "ocean". The "surface structure" is the "waves" of the ocean; the "depth structure" is the water beneath the waves. These surface structures of different philosophical or religious cultures is what Libbrecht calls the world of *information*. However, the depth structure, or the water beneath the surface of the ocean, which is the "real Reality" is shared by all philosophies. This depth structure of philosophy is what Libbrecht calls *energy*. *Energy* is therefore the cause of everything. It is everything and nothing at the same time. However, according to Libbrecht, energy cannot only be understood as a substance, it can also be studied in its effects, and in how it functions. Different philosophies have different expressions of this depth structure or *energy*. These expressions are the different observations of how *energy* functions. This functionality, in turn, is expressed with the concept *information.*

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[2]Leo Apostel was one of the strongest representatives of post-war philosophy at the University of Ghent in Belgium. This school of philosophy not only represented both a secular and scientific approach to philosophy, but also emphasized the necessity for values and normative frameworks (Batens and Christiaens 1999).

Information, as Libbrecht explains us, is derived from in-forma-tion, or "being in form". Energy, on the other hand, is derived from the Greek ἐνέργεια, "in the works". He explains that energy is only observable "in its works", i.e. in its function. Libbrecht develops a comparative model to compare different philosophical worldviews. Methodologically, he believes that there has to be enough similarity as a ground to compare (the energy), whereas we can also observe that on the surface, various philosophies can be very different (the information). Libbrecht's models consist of three philosophical worldviews. These worldviews are "ideal types". This means that the worldviews are not discretely distinct from each other, but that each particular philosophy can tend towards with either of these ideal types. They do not exist in reality, but are limit situations. The geographical positioning of the three worldviews (Greek, Indian, and Chinese) is not a means of limiting these worldviews to these regions, as if Western philosophers only think a certain way, and Chinese philosophers another way. The three ideal types each emphasize a different relation to the world and the place of humans in it. In their contribution to this volume, Janssens et al. (2020) give a detailed outline of the comparative model and the three ideal typical worldviews, so I will only summarize it briefly relevant to the philosophical question of *energy*. The first worldview emphasizes "Being" and can be broadly related to the Greek-monotheistic-scientific philosophies. The second worldview emphasizes "Non-Being" and can be broadly related to the Indian-Buddhist philosophies. The third worldview emphasizes "Becoming" and can be broadly related to the Chinese-Daoist philosophies. We have denoted that *energy* refers to the "real Reality" beyond the phenomenal and the particular worldviews and that *energy* is defined functionally, "in its workings". This means that *energy* as a comparative concept in Libbrecht could also say to equal God, or nature, or *Emptiness*, or the ground of Being, dependent on which metaphysical model you prefer (Libbrecht 2007). *Energy*, for Libbrecht, is without properties, it is the foundation of reality, and it enables us to compare in the first place.

The first worldview, according to Libbrecht, is the scientific worldview which emphasizes reality as "Being". This means that reality can only be observed as it appears as information. Everything is "Being" is *energy*, but this energy can only be observed in its function. *Energy* in this worldview, according to Libbrecht, is still an "unknown", which becomes gradually known by means of scientific inquiry. The physical definition of *energy* is most applicable to the interpretation of the concept of energy in this worldview: "energy is the property that must be transferred to an object in order to perform work on, or to heat, the object". It is this understanding of energy that is commonly used in philosophical or ethical debates regarding energy. Let me put that more firmly: Greek-monotheistic-scientific is the dominant view on energy and therefore obfuscates other interpretations of energy.[3] The scien-

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[3] For the secular-minded reader, the hyphenation of "monotheistic" and "scientific" might lead to some confusion. According to Libbrecht, science and Christianity are much less oppositional as usually assumed. Scientific culture emerged in Christian Europe. To a large extent, both rest on a similar metaphysical imagination. The connection between energy, cosmology, and God has, for example, been explored in a theological edited volume by Bowman and Clayton (2012).

tific worldview aims to understanding the world through linear causality and through the functioning of energy. The advantage of this view is that it is able to acquire very precise measurements. How much energy is available? How is this energy distributed? How much energy is available for humanity and how is this energy distributed? It is a worldview that enables a calculative approach to energy and to energy ethics and justice. The disadvantage is that this view is too narrow. It fails to acknowledge that *energy* is not limited but limitless. It also fails to acknowledge that what we might do to achieve energy justice is not a more just calculus of distribution, but instead a broader imagination of *energy*.

This brings us to the other worldviews. Let me first note something relevant here. Comparative philosophy is sometimes used as a form of "escape" from a Western perspective. In a form of reversed Orientalism, the philosophies of the East are admired for being more wholesome, more sensitive, and more natural than the artificial, economical, and rational scientific worldviews of the West. In a recent publication of David Palmer on Daoism, he has pointed at the fact that Chinese and American expressions of Daoism are now already inextricably interwoven (Palmer and Siegler 2018). The difference between "West" and "East" becomes thus rendered meaningless; instead we have to acknowledge there is an accelerated circulation of cultural codes globally. One of the strengths of the comparative model of Libbrecht is that it does not oppose "the West" versus "the East", but that it instead proposes three worldviews: "Being", "Non-Being", and "Becoming", and that wholesomeness is ultimately to be found in a balance between these worldviews, rather than rejecting one in favour of the other (Libbrecht 2005). When we move to the second and third worldviews, we are not looking to contradict the Greek-monotheistic-scientific worldviews, but to broaden the scope of its horizon. A second note I should make here is that the specific biases in Greek-monotheistic-scientific worldviews are not limited only to the concept of *energy*—though it is the focus of this text—but also to the concepts of justice and ethics. To broaden our imagination from the Greek-monotheistic-scientific worldviews to an extended worldview means destabilizing all these concepts at the same time. We cannot simply hope to find solace in changing one concept by an extension with Eastern insights but stick to a calculus of justice and ethics that is informed by a Western worldview. When you change your metaphysics, you change your ethics as well. Part of this work is being done, for example, in Sovacool et al. (2017) and Janssens et al. (2020).

12.3 The Indian-Buddhist Worldview

Now then, the second worldview is expressed in Indian and Buddhist philosophical cultures and is characterized by an emphasis on "Non-Being". While in the Greek-monotheistic-scientific worldviews, *energy* is unknown, but will become known as a result of scientific inquiry, in the Indian-Buddhist worldviews, the unknowability of energy is absolute. It is rationally unintelligible. In Indian religion and philosophy, the world is considered *Māyā* or illusion. The concept of energy is expressed in Sanskrit

word *prāṇa*. *Prāṇa* can mean breathe and can also be compared to the concept "atman" which also means breath or soul. It is linguistically related to "atmen" in German (to breathe) or "adem" in Dutch (breath). The "real Reality" is beyond the world of phenomena, or information. Where in the Greek-monotheistic-scientific worldviews, the informational world acts as our only access to the real Reality, in the Indian worldview, only the *rejection* of the informational world can serve this purpose. Buddhists even go as far as to reject the concept of "atman" as something substantive. According to them, there is no human soul or "breath" as a form of energy beyond the phenomenal world. They state the idea of *an-atman*, no soul, no breathe, or no energy. The "real Reality" is, in the Buddhist tradition, called *nirvana* or *Emptiness*. Much has been written on how to interpret this. Libbrecht explains us that the *Emptiness* of *nirvana* should be understood as an *informational Emptiness* (Libbrecht 2007), but that this *Emptiness* is actually full of (pure) *energy*. This is not *energy* in its scientific definition, since it precisely lacks any capacity to perform any work. It has no informational properties. Later Buddhist writers would emphasize that both the informational world and the nirvana are the same thing. They say: "*Emptiness* is form, and form is *Emptiness*".[4] This emphasizes that the Indian-Buddhist worldview rejects to describe the world or the energy as "something", as a "Being", but as a "non-Being". What are the ethical implications of this position? For Buddhism, attachment to the belief that reality is something is the cause of all suffering. Our desires bind us to the phenomenal, informational, reality, which is not real. While in Western ethical frameworks, the concept of justice is based on an equal distribution of the fulfilment of desires (in the physically determined interpretation of *energy*), in a Buddhist worldview, it would actually be most just to relieve people from their desires and distribute Nothing. Climate crisis, in a Buddhist perspective, is precisely the result of our desires. The result should not be an equal distribution of energy in the form of work (*energeia*), but an equal diminishment of energy, until it is being reduced to its core—Nothingness. The lesser your responsibilities and attachments to life, the more developed you have become. In some Buddhist monasteries, the highest management functions are performed by the novices, while the cleaning of the lavatories is reserved to the most enlightened of monks. Energy justice in such a worldview would be the result of less energy for everybody, instead of an equal distribution of what we have. It would mean a re-evaluation of the lack of functional energy.

12.4   The Chinese-Daoist Worldview

There is a certain nihilism present in the Buddhist worldview, which has been pointed out by several philosophers, for example, by Friedrich Nietzsche (Mistry 1981). Buddhism, according to Nietzsche, is understood as a rejection of life, since the first Noble Truth identifies life as suffering. In this interpretation, Buddhism

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[4] This is a famous quote from the Heart Sutra.

does not really provide an ethics, but more of an anti-ethics—a path of liberation from suffering. Maybe it is impossible both to "equally distribute" functional energy and to diminish it to its "pure" quality of Nothingness as in the case of Indian-Buddhist worldview. Therefore, we have to look at the third worldview.

As I have stated before, it has been highly innovative of Ulrich Libbrecht to recognize that "the East" is not a single worldview opposed to "the West". Even more so, we could even say that the third worldview Libbrecht proposes is even more different than the Greek-monotheistic-scientific and the Indian-Buddhist worldview are from each other. The Chinese culture, according to Libbrecht, developed a philosophical perspective completely different from both the West and India. He summarizes this by emphasizing that the Chinese-Daoist worldviews emphasize *Becoming*, the transformative qualities of reality. These qualities are inherent to reality: they are immanent (which is expressed by the Chinese term *zìrán* 自然). The subject of the study of philosophy is not some abstract form of logical *Being*, but instead, the entire natural cosmos. Where energy is understood to be only observed in its functionality in the Greek-monotheistic-scientific world-views, and ultimately *Emptiness* in the Buddhist worldview, the Chinese-Daoist worldviews simply state that energy is inside everything; energy is understood as a force of life which they call *qì* 気.[5] This is not the same as a personal "soul". It is a life force which permeates everything. The body, which is the vessel of *qì*, takes a much more prominent place in the Chinese-Daoist worldviews. All forms of physical practices are propagated to increase the flow of *qì*. *Qì* is not external, but innate. It permeates everything. The limits of *qì* are only its limits to flow. The *qì* is not caused by anything—there is no moment of creation as is common in the Christian worldview or is, for example, stated in the scientific imagination of the big bang.[6] Instead, nature - or *energy*, the cosmos - is seen as its own cause, *zìrán* 自然 ("thus by itself"). It is "spontaneously at ease", and the flow is natural. It is artificial human culture which limits the flow of *qì*. Chinese medicine is therefore aimed at diagnosing the blockage in the flow of *qì*, in order to let it flow naturally again inside one's body. The same principle is applicable to Chinese ethics. Both in Confucianism and Daoism,[7] the ethical principle is to develop oneself towards the

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[5] The pinyin transliteration is *qì* and indicates a fourth tone (descending). In simplified Chinese, it is written 气 and it is a fairly common character, referring to gas, air, and breathe. *Tiānqì* 天气 means "weather" (literally "heaven air") and *xiāngqì* 香气 is a fragrance. It can also be used in expressions related to anger, such as *qì kū le* 气哭了, be annoyed to tears ("*ku*" is to cry). In classical Chinese, it is written 氣. Many earlier Western texts would use Wade-Giles transliteration and would write *ch'i*. This should not be confused with T'ai Chi, which should be written in pinyin as tài jí, which means great pole. *Qì* is, however, used in the name of the related practice Qi Gong.

[6] The big bang theory was proposed by a catholic scientist, Georges Lemaître.

[7] There are significant differences between Confucian and Daoist ethics. Although both philosophies agree that one should develop oneself, they disagree on how the final goal looks like. Confucianism emphasizes cultivation, while Daoist emphasizes de-cultivation. However, we should note that a strong difference between Daoists and Confucians is of later date and part of polarizing tendencies and power struggles in later Chinese history. At the times of the classical Daoist and Confucian philosophers, they did not recognize each other necessarily as different schools of thought. For the sake of argument here, it is not necessary to make a strong distinction either.

best possible natural flow.[8] In the Chinese-Daoist worldviews, everybody is understood to have an innate talent to develop this (Yao and Zhao 2010). This "mandate of heaven" is your ethical instruction, your assignment in order to let the natural *qì* flow as naturally as possible through your body.[9] In the Chinese-Daoist worldviews, according to Libbrecht, technological developments are looked at with much more suspicion. In Daoist philosophy, technology only brings humans away from the natural flow of life. Yuk Hui has made a convincing case to show that technology in China has a completely different meaning from the common Greek understanding (Hui 2018). The Western concept understands *energy* often as a cause which sets things in motion. In Chinese thought, *energy* or *qì* is transformative: it does not start a movement, but it changes the form through which it flows, literally. While the Greek-monotheistic-scientific worldviews understand *energy* to be the "cause" of an "effect" which can be measured, in Chinese thought, *energy* is a field which permeates everything. If the field "moves", everything in the field is moved. Libbrecht calls this a "reticular causality" instead of a "billiard ball causality". In terms of responsibility and therefore justice, this both increases and decreases individual responsibility. It increases the personal responsibility in the sense that your cultivation,[10] which enables (your) *qì* to flow more freely, has a direct effect on other beings around you. On the other hand, it also decreases personal responsibility, since you are only a very small part of a much larger framework. If all bodies move into one direction, your movement in another direction won't have much effect. The popular understanding of Chinese culture is that it is "less individualistic and more collective".

At this point, I would like to make a small side remark on Buddhism. In the comparative model, Buddhism is part of the "Indian worldview"—Buddhism originated in India and is a direct reaction to the Brahmanic worldview (which since two centuries would be called "Hinduism"). However, China has been strongly influenced and has a strong Buddhist culture itself as well. How does this relate to the Chinese worldview of *qì*? According to Libbrecht and other sinologists (Zürcher 1959; Mollier 2016), Buddhism in China was strongly influenced by the Chinese worldview. The best expression of this is found in Ch'an Buddhism, which is best known under its Japanese name Zen. Many have argued that Ch'an Buddhism is a sort of mix between Daoism and Buddhism. In Indian Buddhism, the ethical direction towards *Emptiness* is an active intentional process of "emptying". In Chinese Buddhism, however, the *Emptiness* is called *Buddha Nature*, and it is understood to be inside everything. This Chinese understanding of Buddhism is much more in parallel with the concept of *qì* in the Chinese-Daoist worldview. The only problem is that we are not aware that we are Buddha Nature; therefore,

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[8] We can recognize a Heraclitan understanding of nature as well in this form of thinking, *panta rhei*. This is an example of how these worldviews are not strictly geographically demarcated.

[9] The concept of "heaven"—*tiān* 天—in the Chinese worldview is not the same as the transcendent heaven in theistic metaphysics, as the place where God resides. Instead, it should be understood as the entire cosmos, of which our earth is part.

[10] A Daoist would say that this cultivation is in fact a de-cultivation, because it is precisely the culturedness of human society that prevents the *qì* from flowing freely.

in Chinese Buddhism, we should acquire merits so that we are graced with an awareness of our Buddha Nature. In these forms of Buddhism, you often see people offer incense to Buddhist statues (***bodhisattvas***)—this is a method to acquire the necessary merit to achieve the blessing. This view competed with the Daoist and Confucian worldviews. In Chinese Buddhism, other than acquiring merits, self-cultivation is of less importance; it has a similar metaphysical outlook, namely, it understands *energy* to be inside everything, and we would only need to enable it to flow freely.

To summarize, the comparative model of Libbrecht proposes three different worldviews, which are ideal types of philosophical systems: the "Western", the "Indian-Buddhist", and the "Chinese" worldview. According to Libbrecht, though they all have a concept of *energy*, this concept is expressed in different ways. He plots these worldviews on an axial model (see Fig. 12.1). The y-axis is the axis of
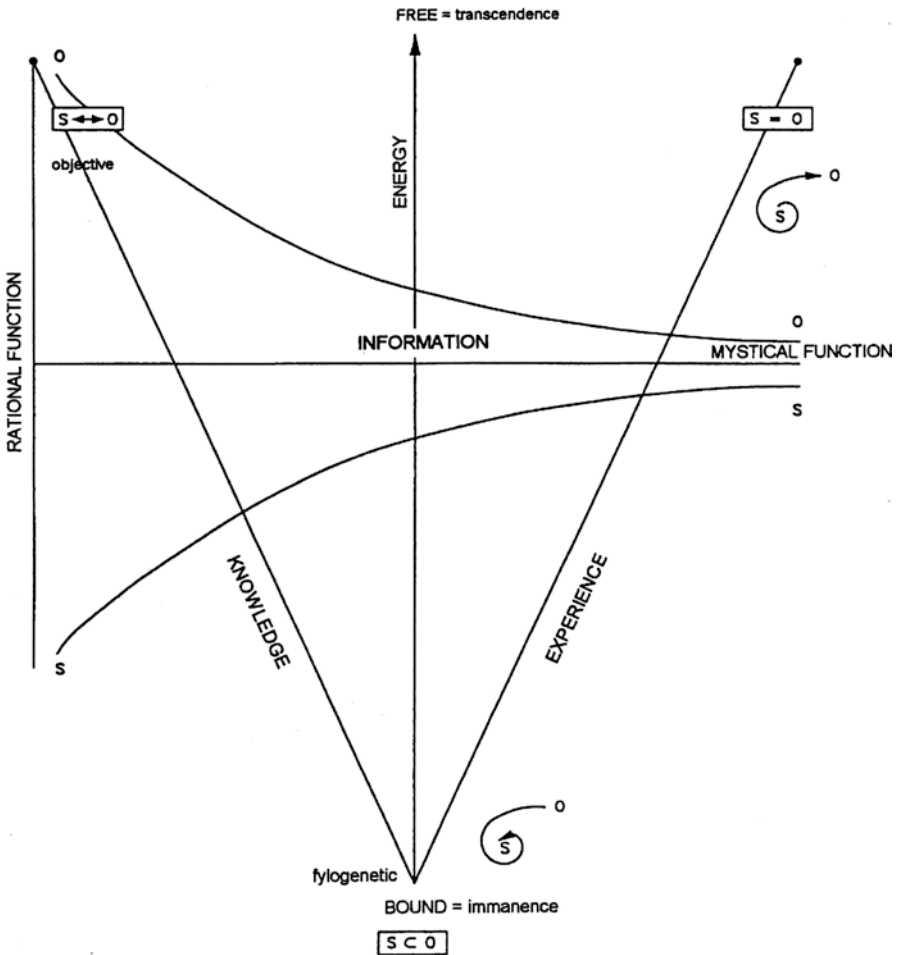
Fig. 12.1 Free and bound energy

energy. On the lower end of the axis, the energy is *bound* by the laws of nature. This is where Libbrecht situates the Chinese worldview. *Energy* is most "free" in these worldviews, precisely when it is not free to move beyond its natural flow. Energy is immanent to the world. The primary ethical principle of Daoism is *wúwéi* 舞為, the practice of non-action. By acting (freely), you disturb the free flow of energy; instead, by not acting, by just spontaneously following what nature orders you to do—which is, by doing nothing, *energy* is most free, but also most bound. On the upper end of the axis of energy, Libbrecht situates the other two worldviews. In both other worldviews, humans do not flow with how energy commands them to flow, but they use free energy to transcend the natural world. In this Western-scientific worldview, this means taking control over nature by means of developing an artificial world to create as much wealth as possible from it. This is achieved by measuring, understanding, and controlling nature in order to make it fit our needs. The challenges of climate change and the desire to "fight climate change" and "save the planet" are still part of this same worldview of taking control over nature. In the Indian-Buddhist worldviews, the flow of energy is considered a chain. Energy forces us to want one thing, and then something else, which results in a state in which our lives are in permanent illusion. Instead, the Indian-Buddhist worldviews propose to empty oneself of the flow of the phenomenal world, to experience the *Emptiness* that is behind all existence. For this, we need to direct our free energy towards our emotional experience and our ability to be touched by the mystery of nature. Though in both cases, the energy is free—which means unbound by the natural flow or things— the informational quality of it is different; in the Western-scientific worldview, we relate to it rationally, while in the Indian-Buddhist worldview, we relate to it emotionally.

12.5 Comparative Reflections

Our engagement with these concepts is very challenging to our commonly held beliefs. To be able to integrate them with the common Greek-monotheistic-scientific worldviews would be nothing short of a paradigm shift. They do not serve in any way to discredit these worldviews. In fact, it is quite the opposite: Greek-monotheistic-scientific-worldviews might even be reinforced. But it does set clear boundaries to the epistemological limits of scientific statements. The concept of *energy* cuts through the heart of the matter. I believe it is not enough to "only receive inspiration from other philosophies" in order to enhance our concepts of energy, ethics, and justice. We should have the courage to completely turn our concepts around. Only in this way, we can see how our bias expresses certain worldviews, which are common to the liberal democratic political world order and which are beyond scientific reach.

I will try to give an example of what I mean. The notion of "energy justice" appears to presuppose an equal or more equal distribution, for example, by means of access, to energy sources, which should also be environmentally sustainable. Concepts such as equality, sustainability, and distribution, however, let alone that we can have an impact on those things as humans, are absent in the non-Western worldviews which are described. Energy is in fact the most equally distributed resource of anything. In the Indian-Buddhist worldview, having more of it is even a disadvantage. While in the Chinese worldview, it is not about receiving or being permitted access to energy, but it is about finding your own way towards the source of energy inside yourself. In part, Eastern thought is so radical, because justice is not something to achieve (as is common to the transcendental ethical framework which is common in Greek-monotheistic-scientific worldviews), but the world is always already in and of itself.

The question of energy justice starts from our understanding of the community or communities who stakeholders in energy ethics are and therefore in the conceptualization of *energy*. It is obvious that there is a difference between an energy ethics which only benefits a certain group of people and an energy ethics which benefits the whole of humanity. But there is also a difference between an energy ethics which benefits humans and an energy ethics which also benefits animals, for example. However, this reasoning might need to be extended to even larger communities; the communities of all living beings (including plants, archaea, mushrooms, and bacteria), but maybe even to the community of artificial beings (robots, computers, smartphones; what is at stake for the non-human non-biological intelligent bodies on our planet?). While the concept of ethics appears to be straightforward, it is strongly dependent on the kind of community we want to imagine for the ethics to apply to. Often, there is an implicit universal humanism present in the understanding of ethics, which needs both to be acknowledged and put into question. The main reason for this is not only a philosophical critique of the primacy of the human as the sole or primary central point of meaning; it is mainly informed by an increasingly wide understanding that humanity is only a minor player in a much larger ecological environment and furthermore that the nature of this ecology has come under major transformations in the past century. In this light, ethics as the exclusive domain of human actions and behaviour should be put into question.

How can these transcultural understandings of energy help us advance our imagination of energy justice? I argue in favour of a strong re-evaluation in favour of *energy*, to prevail over the human world. Most ethical systems—such as utilitarianism, deontology, or virtue ethics—focus on the human actor as beginning and endpoint for meaning in the world. A conventional energy justice is still emphasized on justice for humans. When we take these transcultural considerations into account, the question of energy justice can therefore be restated as "What is justice from the perspective of energy?"

We have been comparing philosophies from long gone male philosophers from ancient times. They inhabited an earth that is absolutely different from ours today. As contemporary philosophers, we have become acquainted with all philosophies from all times. It has therefore become nonsensical to "locate" any philosophy in a certain area. The "Western" worldview we have described is equally, maybe even more, prevalent in China today, and the Buddhist idea that all "form is *Emptiness* and *Emptiness* is form" is expressed in the culture of the entertainment industry, for example. Philosophies have become planetary currents; their flow is ever increasing. We do not have to look beyond boundaries anymore, because there are no boundaries. Everything has become interconnected; everything influences everything—similar to the *qì*-field of the Chinese-Daoist worldview. The planet Earth is now so increasingly dominated by human activity that many philosophers and geologists are referring to our era as the Anthropocene. Human activity has become the dominant force in planetary development. And if the human-centred approach to justice, ethics, and technology will continue to dominate our actions, it is very likely that the conditions of flourishing of human and other life on this planet will be gravely undermined.

So, what is justice from the perspective of energy, beyond the human? In a humanistic perspective, humanity is seen as "responsible", for example, for climate change, and as the "caretaker" of nature, and therefore *energy*, and being an active participant in equal distribution. From a post-human perspective, it is *energy* which is responsible for planetary justice. Not human actions are the starting point of ethics, but the stored *energy* in fossil fuels that liberated themselves, enslaved a primate species in its wake, and now cause the planet to warm several degrees—some environmentalists have argued. All life, Jeremy England (2013) has argued, can be understood as an extension of the Second Law of thermodynamics, the dissipation of *energy*: entropy. *Energy*, as we have seen in the Chinese worldview, is transformation; transformation always has a dimension of loss and nostalgia: some forms of life won't be retained in the transformation of something new. The political is no longer a faculty of the human realm; it is a planetary, biological, and energetic field.

Humans are not excluded from the transformative planetary processes, but they are not central to it either. The *Buddha Nature* is in all of us: humans, animals, plants, fungi, stones, rivers, and mountains, but these days increasingly also in robots, smartphones, solar panels, coal plants, biomass, and nuclear plants, plastics, minerals, computer servers, concrete, wind turbines, and innumerous other forms of *energy* transforming bodies. All of us are equal stakeholders in the process of energy justice: this is what Bruno Latour (2014) has called the *Parliament of Things*. This posthuman shift in materialist philosophies has recently gained increased interest, for example, in the work of Karen Barad (2003) and Rosi Braidotti (2013), amongst many others. Energy ethics from a transcultural perspective challenges us to imagine a new collectivity, a new "we" beyond the West and beyond the East. In my own article on East Asian religion, I have emphasized that we should imagine a new form of "rhizomatic belonging" that acknowledges that many people do not exclusively

belong to one religion but navigate themselves in a religious ecology of various religious forms and expressions (Oostveen 2019). This call for "rhizomatic belonging" should also be extended beyond the domain of the human. Humans are not solely responsible for climate change or the ecological predicament. Humans are equal actors in and intra-species rhizomatic assemblage of terrestrial agencies. In the same way, humans are not the sole beneficiaries of the *energy* transition that is necessary. This transition is forced on "us", the posthuman collective assemblage, by climate change. The ethical assignment has not changed from Aristotle, or the Stoics, or the Confucians, or the Daoists: we have to develop our nature in a way that maximally enables our innateness to express itself. Energy justice can only be imagined if it serves *energy* itself. That is the task we are given by a truly transcultural philosophy. This transcultural philosophy is informed by various philosophical expressions of the imagination of the functioning of *energy* and serves values this diversity as the depth structure of reality.

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Chapter 13
Energy Justice and Intergenerational Ethics: Theoretical Perspectives and Institutional Designs

Check for updates

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Abstract In this work, we discuss how both contractualism, in the Western tradition, and communitarianism, in the African interpretation based on the idea of Ubuntu, conceptualise intergenerational justice. Even though both philosophical theories, taking into account differences and shortcomings, provide theoretical answers to intergenerational justice dilemmas, the implementation of actual policies in the interest of future individuals does not follow straightforwardly. Accordingly, in the second part of the chapter, we analyse what policy tools have been implemented or conceived to deliver intergenerational justice and we advocate a pragmatic approach pointing towards a mix of different policy tools.

13.1 Introduction

Energy justice is a relatively new theoretical framework for understanding the sustainability of the energy system and the allocation of burdens and benefits among all those actors that are involved in its various phases: those who produce, deliver, and consume energy and those who are called to manage the corresponding waste. McCauley (2018: 1–2) has recently defined energy justice as "the application of rights (both social and environmental) at each component part of the energy system". As any distributive scheme concerned with the assignment of social rights and the correlative duties among the members of society, energy justice brings with itself the problem of defining its scope. What are the *geographical* (or political) and the *temporal* borders that delineate the group of individuals whose rights and duties

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should be taken into consideration when referring to energy justice? Both issues are particularly pressing in the energy justice discourse, even more than in classic disputes of distributive justice, given that both economic gains and negative externalities stemming from the phases of the energy system tend to be global in the geographical extension and misaligned in time, the classic example being climate change.

In this chapter, we discuss the temporal aspect of the scope of energy justice. More precisely, we tackle the question of whether future people should be considered as participants in the scheme of redistribution that underpins the ideal of energy justice. In doing this, we firstly confront two prominent theories of distributive justice that have been constantly juxtaposed in the literature on political philosophy, starting from the second half of the twentieth century. The first one is the social contract theory, which we consider in the classic formulation given by John Rawls, in the moral variant proposed by Thomas Scanlon, and in the contractarian, version devised by David Gauthier. The second one is communitarianism, not simply in the Western formulation given in the literature on liberalism, but also through the lens of the African political philosophy of Ubuntu. Lastly, we discuss how the philosophical concerns for future beings have been translated into specific policies, with the aim of weighing the interests of present individuals against the social rights of posterity.

In pursuing this discursive path, we unfold our analysis in line with the approach taken by Sanusi and Spahn (in this volume), which is based on the dualism between an individualistic conception of human beings as utility maximisers (that they exemplify quite generally with the West) and a communitarian view on human relations (that they exemplify in the vision of Ubuntu). Yet, differently from them, we are mainly interested in investigating the intergenerational offshoots of these philosophical accounts and the public policies that they can substantiate.

13.2   Contractualism and Intergenerational Justice

In Western moral theory, contractualism is the doctrine according to which the rightness of any action can only be tested against the terms of a hypothetical agreement between free and equal people. In political theory, the ideal of an impartial agreement is mainly used to test the legitimacy of political power. Within political contractualism, it is possible to distinguish between Kantian versions of contractualism, in which people decide to conform to an impartial agreement because they are moved by the moral need to make inequalities justifiable to everybody, and Hobbesian versions of contractualism, where the primary impulse towards bargaining is for the individual to guarantee himself the maximum expected payoff.

In both moral and political theory, the problem with reconciling the idea of the contract with concerns of intergenerational justice is basically the same. If we assume that our obligations of justice stem from an agreement that we reach in a hypothetical bargaining situation, does it make sense to say that these obligations

also extend to people who are not born yet? A great deal revolves around the issue of why people should decide to look for an agreement in the first place and why they should conform to it thereafter. If they do it for reasons of reciprocity or mutual advantage, it becomes difficult to explain why the bargaining parties should take into consideration the interests of those people who cannot reciprocate because they are not yet born. In addressing this theoretical point, we shall consider contractualism in a transversal way, passing through moral and political theory and looking at three different bargaining models. The first one is the semi-political model of contractualism famously proposed by John Rawls in *A Theory of Justice* and later amended and integrated in subsequent works. Very briefly, Rawls considers society as a "cooperative venture for mutual advantage". By joining among them, people manage to yield, in absolute terms, more wellbeing than they would have were they to remain by their own (Rawls 1999: 4). However, a significant political problem is that those with more talent and with more resources will advance larger claims on the benefits stemming from cooperation. So, how do we justly divide the cooperative surplus? The answer provided by Rawls is in a fair way. In order to do so, Rawls returns to a thought experiment. He asks us to imagine all the participants in the cooperative venture in an "original position", where they are covered by a "veil of ignorance", meaning that they do not know their personal qualities and their social position, while simply having basic knowledge about politics, economics, and human affairs (Rawls 1999: 10–19, 118–123). Rawls' conclusion is that under such circumstances, the rational strategy for self-interested individuals would be to adopt a principle of socio-economic justice, named the "difference principle", according to which "social and economic inequalities are to arranged so that they are […] reasonably expected to be to everyone's advantage"(Rawls 1999: 53).

A second contractualist model, although some authors prefer to call it contractarian (see Cudd and Eftekhari 2018), is the Hobbesian interpretation of the bargaining for the cooperative surplus that was proposed by David Gauthier (1987). Here there is no veil of ignorance. Economic agents perfectly know who they are and which social and individual strengths they can rely upon during the session of the social contract. This means that there are no moral premises in the structuring of the initial bargaining situation, because the parties seek to maximise their individual payoff starting from positions that have not been hypothetically levelled out. Gauthier maintains that under these circumstances, the parties would be stuck in something like a prisoner's dilemma. The best collective strategy is to cooperate, in order to yield the cooperative surplus. Yet, every agent would find it rational to defect while others cooperate, in order to maximise her personal payoff and avoid the cost of cooperation. The risk, clearly, is that if every agent seeks the choice that is individually rational, i.e. freeriding, we end up in the worst outcome, both from the individual and the collective point of view—the non-cooperative equilibrium (Gauthier 1987: 113–156).

Given these premises, Gauthier argues, the bargaining parties have an interest in reaching an agreement and later in securing it, but at the same time, the best individual outcome is the one in which the agreement is obtained with the single agent making no concessions at all. Obviously, given the cooperative nature of the first

objective, it is not reconcilable with the second one, because self-interested agents would become stuck in a non-cooperative equilibrium. Therefore, Gauthier maintains that in drafting the social contract, the rational individual strategy consists in following the rule of the "minimax relative concession", according to which each agent makes subsequent concessions in relation to her best outcome, under the condition that each concession is reasonable in comparison to the ones made by other parties. The result, in theory, would be an agreement that makes society better off at the lowest individual cost for everyone (Gauthier 1987: 136–137).

Lastly, a third formulation of the contractualist idea is the model of reasonable non-rejectability that has been developed by Thomas Scanlon. He argues that an action is morally right if others cannot reasonably reject it after having been properly motivated. More generally, the rightness or wrongness of any action depends on whether it would be allowed or disallowed by a "set of principles for the general regulation of behaviour that no one could reasonably reject as a basis for informed, unforced, general agreement" (Scanlon 1998: 153). Obviously, any redistribution of resources is supposed to worsen the wellbeing of some individuals while benefiting some others. Given that in Scanlon's contractualism there is no veil of ignorance, the "losers" of redistribution, no matter how well off they are, would have reasons to oppose the redistributive policy from their specific social position. Yet, wellbeing is not the only thing that matters for the purpose of justification. The "winners" of redistribution might counter-oppose arguments based on the principle of fairness, of compensation for harm, of restitution for unjust enrichment, and so on. In the end, every person is required to weigh his reasons for action against others' reasons in an impartial way: an action that has passed this test is morally right.

From these brief remarks, it follows that the problem of future people can find a theoretical solution in Scanlon's moral contractualism, while it is more difficult to find space for posterity in Rawls' theory and extremely difficult in Gauthier's model. Regarding the first point, since in moral contractualism individuals are not seeking the right principles to split the cooperative surplus, but only those that others could not easily reject, the obstacle of non-reciprocality becomes negligible. Even though the present generation cannot enter in a mutually beneficial relation with future ones, provided that present actions can potentially affect the wellbeing of future individuals, there is no reason why present individuals should not weigh their reasons for action against the hypothetical counter-objections that might be moved by future individuals (see Ashford 2018). Moreover, given that moral contractualism is not aggregative as utilitarianism is, the fact that only a small group of future people might have reasons to reject an action that a large group of present people approve is not enough to make it morally acceptable, because we only have to take into consideration the weight of the reasons in favour and against this action regardless of the number of people positioned on the two sides of the dispute (Southwood 2009; Ashford 2003).

Yet, the complication when reasoning about energy justice is that we can only speculate about what reasons future people would have to reject our present actions, and in doing this, we do not have a precise knowledge about the technological capacities and the environmental conditions of the future societies that might suffer the consequences of past actions. Consider, for example, the basic case of over-

appropriation of fossil fuels by the present generation. In assessing the weight of the counter-arguments that might be raised by future people on the ground of justice in appropriation and of fairness in the allocation of negative externalities, we should predict how much future people would have to rely on fossil fuels versus renewable energy and what is the remaining quantity of CO_2 emission that the environment could absorb before being irremediably damaged.

When reasoning about contractualist models based on the expected benefits of cooperation, the huge obstacle we encounter, instead, has to do with the fact that reciprocity between generations can only be indirect (Gardiner 2009), and indirect reciprocity does not account for cooperation for the purpose of mutual advantage. Admittedly, Rawls has long pondered over this problem and has progressively changed his mind about it. His first solution, proposed in *A Theory of Justice*, consisted of arguing that the difference principle cannot be applied to different generations, because even though the veil of ignorance prevents them from knowing which specific generation they belong to, they know they are contemporaries; hence, they would have no reason as agents aiming to maximise their payoff, to redistribute towards future individuals. Nonetheless, Rawls adds that if we look at the parties as "heads of families", who care for their next descendants (Rawls 1971: 128–129), we can expect them to agree to an intergenerational "just saving principle" that constrains the application of the difference principle among contemporaries and is aimed at preserving the basic conditions for justice over time (Rawls 1971: 289).

In later works, Rawls postulated that the parties would agree on a just saving principle, for the mere reason that they "must want all previous generations to have followed it" (Rawls 2005: 274). Whether Rawls could have found a better solution for dealing with future generations remains an open issue. On the one hand, there is no apparent contractualist reason why an agent in the original position might find it rational to save for future people, rather the only thing she may wish for is that the previous generations have saved for her. On the other hand, Rawls maintains that there is a pre-existent duty to secure justice over time, and he seeks to anchor the just saving principle to it. Yet, as rightly stressed by Heyd (2009), this intergenerational commitment is moral rather than political, because it has nothing to do with fairness; hence, the just saving principle should be considered as a principle for securing justice rather than as a principle of justice *tout court*.

Nonetheless, against Rawls and against those who criticise Rawls for insisting on a principle of intergenerational redistribution where no cooperation occurs, the objection that a form of direct reciprocity is inherent in the fact that generations are porous sets that continuously overlap may also be raised. In any moment in history, there would be people from two or three (or even more) different generations coexisting at the same time, and obviously these generations need to cooperate among each other. David Gauthier follows this line of reasoning when he maintains that in dealing with future individuals, we do not need to drop the "assumption of mutual unconcern", because every individual has an interest in securing an agreement with those who overlap his generation (Gauthier 1987: 299).

Talking about energy, just think, for example, about a policy that maximises the wellbeing of the people that are likely to die within 30 years from now, while leav-

ing the biggest share of the costs—in terms of pollution and of adaptation needs—to those who will live during the next 90 years from now. Some of the people from the second group—namely, those who will die between the next 30 and 90 years—are already in existence; hence, we can expect them to oppose this policy on the grounds that it would be an unfair way to allocate burdens and benefits of social cooperation. Accordingly, we might be tempted to argue that indirect reciprocity is a false problem, because social cooperation unifies subsequent generations in an infinite chain of justice. Yet, the limit of this approach is that it does not work with the so-called "time bombs". That is to say with those situations in which negative externalities can be deferred far in time.

Radioactive wastes serve as a classic example of the time bomb dilemma. Assume that all the people who are alive at this moment in a given country were to decide where to stock all their radioactive wastes and how to do it. Consider two options. Option A: we invest N money and in so doing, we ensure that the radioactive waste containers will be safe for an indefinite period of time, only requiring future people to provide for minor maintenance. Option B: we invest N1 < N money though which we built containers that will only keep for the next 200 years, and thereafter our descendants will have to spend N2 > N > N1 money to build a new stocking implant—that is to say, they will have to shoulder the costs of past negative externalities without having enjoyed the correlative benefits. Do we have a duty of contractualist intergenerational justice to choose Option A? The answer is probably negative, because we do not overlap with anyone who will live 200 years from now, and we are not really sure that something like the just saving principle would compel us to choose Option A. This really depends on how we nail down this principle, both in relation to the current level of development and also to the issue whether selecting Option B might jeopardise the chance future people will have of maintaining just social institutions. The odds are that the just saving principle would not suffice to prevent us from leaving the burden of radioactive waste to future people, although this might seem, intuitively, a clear case of unfairness.

To conclude this section, adapting contractualist models to the demands of intergenerational justice presents us with three problems that are exacerbated when dealing with energy systems. First, if we return to a model of moral contractualism à la Scanlon, we do not have many troubles in explaining why we have to justify our actions to future individuals, but we are left with no political arguments to spend with mutually unconcerned individuals who are willing to accept the burdens of socio-economic justice only on condition that we demonstrate that this is the most rational strategy for them. Second, if we opt for a political contractualism à la Rawls, that is to say constrained by the veil of ignorance, we end up with a just saving principle that is incapable of sanctioning the unfairness in the distribution of benefits and negative externalities stemming from the production, distribution, and consumption of energy. Third and lastly, if we embrace Gauthier's political contractualism, we would have good justifications to offer to those people who even refuse the moral preconditions that Rawls imposes on the political bargain, but we remain helpless in cases like "time bombs" where generations do not overlap.

13.3 A Communitarian View on Intergenerational Justice

Another possible solution for building up a coherent set of intergenerational principles of justice might consist of moving to a different methodological premise. Instead of looking at individuals as separate maximisers of their own wellbeing, or "mutually disinterested" beings who struggle with each other for securing the widest possible share of the cooperative surplus, under more or less pronounced moral restraints related to the initial bargaining situation, we might want to centre our analytical focus on the community as a whole. Here, community is interpreted as a group of people who share the same social and cultural features and who are tied in the achievement of common ends. This part of the chapter will take a closer look at communitarianism in general and a specific African conception of the community.

Communitarianism is a broad term applicable to a range of philosophical positions and perspectives in political philosophy and meta-ethics. A central claim made by all communitarian thinkers is a strong rejection of the idea that there are universal values in any thick sense of the word. All comprehensions of value are relative to a specific point of view. It is possible to compare different points of view, but it is not possible to assume what Nagel calls "a view for nowhere" (Nagel 1989). Rawls contractarian ideas and "the original position" (Rawls 1999) are based on an abstraction of human beings that have little relevance to the real-world humans who are all deeply imbedded in language and culture (Taylor 1989; Sandel 1981; Walzer 1983). Thus, the communitarians reject the ontological and methodological assumption in the contractualist thinkers we have investigated so far. In MacIntyre's (1989, 2006) terminology, there are several moral traditions that are not only different, but might have conflicting interpretations of values and justice. This conflict cannot be solved by trying to apply a more rational universal point of view given that even the conception of rationality is based on specific intellectual traditions and we lack criteria to select which tradition that is most reasonable.

A communitarian comprehension of intergenerational justice is articulated by De-Shalit. A community is understood here as consisting of both past generations, current generations, and future generations. Thus, the present-day Jewish community considers itself to be part of a long history of communities that share norms, worldview, and practices. This community will also include future people who will share these commonly held beliefs. The different generations share a common identity of what it means to be part of the Jewish community, and they also share an ongoing discourse of what "Jewishness" means (De-Shalit 1995).

Justice in a communitarian perspective is primarily applicable inside a community since the members share special responsibility to its members. That does not imply that there is no moral responsibility towards non-members, but that such responsibility is based on another moral foundation, humanity (De-Shalit 1995). This raises several important considerations: First, how long into the future should the community be extended? Second, how strong are the responsibilities to future non-members? The current communitarian political philosophy has been developed in the Anglo-American discourse on liberalism and its associated theories of justice. However, the general idea that individuals need to be understood as parts of a

community and that our identity is formed in this community is not restricted to this discourse. Philosophers from sub-Saharan Africa define an example of ideas that have a similar perspective on the individual and the group, for instance.

There are numerous problems with trying to generalise about African thinking. The greatest risk is to use conceptual resources developed outside of these contexts to translate ideas that should be conceived as unique. Still, there are those that argue that there is an African conception of how a community should work (e.g. Mbiti 1969; Menkiti 2017; Praeg 2008; Eze 2008). This conception is not the same as communitarianism in Western philosophy, but it is beneficial to methodologically treat it as a special kind of communitarianism since that makes it easier to compare with other mainstream theories in Western political philosophy, especially contractualist theories. At the same time, we must be careful of not reducing the uniqueness of this tradition while translating it into foreign concepts. Nevertheless, African philosophers themselves use the terminology "African Communitarianism", therefore providing us with grounds for sticking to the same term of communitarianism (Eze 2008).

The key concept in African communitarian thinking is *Ubuntu*. This is a pan-African idea with several linguistic forms, and a simple translation is not possible. As noted by Praeg (2008), the content of Ubuntu is both novel and unique. Treating it as something totally untranslatable would be an exaggeration, but treating it as simply as an African kind of communitarianism would be wrong too. He also notes that we can separate the discourse about Ubuntu as political philosophy, e.g. communitarianism, with the workings of Ubuntu, e.g. sacred rituals in the village life. Both dimensions are concerned with the interdependence between humans (Praeg 2008).

One famous way to sum up the concept of Ubuntu is provided by Mbiti: "I am, because we are" (1969: 109). According to one interpretation of this statement, this means that the individual is not separated from the community but is epistemologically and ontologically submerged in it. According to Eze, we cannot talk about individuals as freestanding; instead, we should use terms such as interrelatedness. Being a person is to be in a dialogical relationship with the community where each member has a responsibility to recognising each other as a person (Eze 2008: 387). Justice, then, should be understood from the backdrop of mutual recognition and responsibilities. This is a mutuality that should not be understood as a form of contractual obligations, but as sharing a common life where each individual has specific roles to play. Some thinkers argue that this interrelatedness can go beyond the human community and also include parts of the non-human nature (Chachine 2008; Lenkabula 2008). However, in what follows the analysis will focus on the interrelatedness between present and future humans.

In Mbiti's conception, Ubuntu as interrelatedness seems to support a social holism where individuals are downplayed compared to the group. The good is primarily communal and not individual (Chachine 2008: 51). Gyekye proposes a more nuanced approach. He argues that Mbiti's analysis fails to take individuals into account and that a social holism is an inadequate interpretation of Ubuntu. Gyekye propose that Ubuntu includes a balance between communal good and individual good. A "moderate communitarianism" must entail proper protection for individu-

als, who retain their separate status despite the fact that they are immersed in the community (Matolino 2009: 163).

Thus, in the moderate communitarian form, Ubuntu does not mean that individuals are fused together with their community. The individual is still epistemologically and ontologically separate, but his or her identity is formed in the community and the individual good life must be found in the community. The common good consists of people living a good life in the community, and this involves each individual's unique subjectivity (Eze 2008). The common good could be conceived as a striving towards consensus between the members where the members adapt their individual pursuits to a degree where these pursuits are fused. Ideally, this would lead to a situation where distributional decisions are accepted as long as they are clearly the best means to protect or strengthen the common good. Yet Eze rejects this idea and argues that consensus will lead to totalitarianism. Instead, he argues that the guiding principle should be called realism. This principle means that we should recognise differences and make an honest attempt to understand the other's point of view. It is in the dialogue with different positions we can come to understanding and conversion of our beliefs (Eze 2008: 393–395). The distributional concern of justice can therefore not be abstracted from the relations in the community but must be shaped of the mutual recognition of such roles.

There are several forms of critique against the different interpretations of the Ubuntu concept. Sono (1994) criticises Ubuntu as glorifying the historical village life that in practice meant that some made decisions that had a significant negative impact on others (Sono 1994). Following Sono, one can argue that in order to answer distributive questions, it is necessary to prioritise some people's claims over other people's claims, and that can lead to a charge of unfairness and resentment. Such charges can be well justified especially when an individual's good is totally disregarded. Another critique is that the local life of the village has very little to do with the modern national states which include numerous groups who do not all share the same idea of the common good (Matolino and Kwindingwi 2013). In relation to this critique, some authors have argued that Ubuntu is an egalitarian utopic ideal that can provide us with a critical instrument on how to judge and plan our current society (Metz 2014).

If interrelatedness or interdependence is the core principle of Ubuntu, this concept should ideally include future generations. There is a relationship between current members of the community and future members since they share their identity. However, there is also a radical asymmetry between the generations in the form of power. Current generations have the power to affect the future ones, but the future ones could at most blame or praise the current ones. Another aspect of interrelatedness is tied to the recognition of each other as persons. Personhood requires recognition of others, presumably with face-to-face meetings as the paradigmatic example, which is not directly possible for future generations. This challenge can be met since recognition can take forms that do not fit the face-to-face form. Rituals that take the historical members of the community into account are concrete examples.

Behrens (2012), who argues that a core African belief is that ancestors should be treated with respect, provides a rationale of how Ubuntu relates to future generations. This provides the foundations for two obligations. First, current generations need to treat the environment as an asset owned by generations. Second, current generations can show their respect towards their ancestors by passing on the benefits they received towards future generations (Behrens 2012: 181f). When the environment is conceived as a common good shared by different generations, it affects the attitude we have towards nature. Overusing, abusing, or damaging the environment robs future generations of their inheritance (Behrens 2012: 183, 187). The second obligation provides an indirect responsibility towards future generations since we can only show our own gratitude to our ancestors by passing on land and resources to those who come after us (Behrens 2012: 185).

How would we understand energy questions through the prism of Ubuntu? A hypothetical example would be if a village faced the need to electrify. The issue can be constrained to be a choice between different systems, such as whether the village should obtain a government loan to buy a small diesel generator, a wind turbine, or solar panels. Any discourse about these decisions would include information about technical feasibility, lifetime, and costs. The concept of Ubuntu also suggests that the discourse would include questions about how this will influence the villages' relation to other villages and the national state. It would take into account equity issue of how the different systems influence the common life of the village. Will everybody have a chance to enjoy lightning during the darkness? Will groups in the community have better access than others? If Ubuntu is seen as striving towards consensus, the discourse should lead to an agreement that would fuse the different interests into a shared decision. As pointed out by Eze (2008), the discourse could also lead to conversion where one particular position emerges as the most reasonable. However, it is perfectly possible that no specific decision will emerge. A key attitude held by the participants of the discourse is that whatever decision made, it must play proper respect to the ancestors and pass on something good to future generations. Thus, one can claim that a diesel-powered generator, which by dispersing CO_2 emissions adds to climate change, will not be a fitting solution since it would be incompatible with passing on something good.

The connection between Ubuntu, intergenerational responsibility, and energy becomes more complex when we turn to large-scale energy systems such as hydro plants. The construction of such plants can not only affect numerous groups negatively, but also provide a positive overall effect on a nation. The main challenge with this case is that it can be argued that passing on a relatively stable source of electric power is the best way to honour the heritage of the ancestors. On the other hand, one can also argue that the construction of the plant will include a destruction of the environment that is owned by all generations of all communities. There is a clear risk that the two concepts conflict and that there is no clear normative path on how to prioritise between the claims of different generations.

The Ubuntu concept does not provide simple responses to the two questions previously asked about the limits to the community: How long into the future should the community be extended? How strong are the responsibilities to future non-members? One can argue that just because I might feel obligated to pass on

something to future persons in my own community, that does not mean that I also have obligations to other communities. An indirect response to this claim is that interdependence extends to the relations between communities. Our own community cannot be separated from other communities, and the common good requires something else than simply focusing at the interests of different communities. As noted above, this might not avoid conflict of interests, but it provides an argument for finding ways to overcome such conflicts. Such solutions need to move beyond personal relations and the village life. They must consider the institutional systems that will strengthen and weaken the spirit of Ubuntu in practice.

13.4   Intergenerational Energy Justice: Implementing Institutional Designs

As we have argued in the previous sections, intergenerational justice is a complex theoretical problem that can be addressed, but not without some caveats by the contractualist tradition, and perhaps more easily by the communitarian philosophical tradition.

In this last section, we will move on to discussing some of the policy attempts and proposals that have been made to address the problem of considering the interests of future generations in policymaking. These could be implemented to deliver some degree of intergenerational energy justice. In doing so, we recognise the importance of delivering a policy grounded approach to the philosophical discussion regarding intergenerational energy justice. The reason might be obvious to many: the urgency of the global environmental problems caused by climate change is a stark reminder that we need to confront ourselves with viable immediate policy solutions for implementing otherwise merely theoretical ideas.

Intergenerational energy justice does not have an established definition per se, even though recently an attempt at defining this concept has been made: "…as a state of policies conducive to an equitable distribution of finite natural and non-renewable energy resources aimed at avoiding any severe damage of the biosphere, which takes account of the equal dignity and of equality of rights of different generations, even when living in distant times" (Pellegrini-Masini et al. 2019a: 5), whereas "intergenerational energy equity", considered by several authors as one of the constituting principles of energy justice, has been defined as follows: "Future generations have a right to enjoy a good life undisturbed by the damage our energy systems inflict on the world today" (Sovacool et al. 2017: 687).

The challenges in establishing energy intergenerational justice lie in devising and implementing those policies that are considered necessary to deliver an equitable distribution of energy resources, particularly because the representation of the interests of future generations can be regarded only limitedly effective when it is delivered through democratically elected parliaments. In fact, we can assume that the elected representatives will, to some extent, also represent the interest of their immediate descendants (as we noted in earlier sections), but they will be less likely

to be concerned with the interests of generations living in the far future. The short-termism of current parliaments has already been highlighted with regard to financial sustainability and, to lesser extent, environmental sustainability (Tremmel 2006a), although the arguments that underpin this problem might be considered the same, particularly when it is argued that they are motivated by people's "perception" and "ideology" (Ederer et al. 2006: 130), meaning with that the public's tendency to consider environments stable over time on one hand and, on the other hand, the tendency of reducing complex choices to ideological issues. Other reasons have been indicated to justify short-termism, particularly the saliency of immediate costs and benefits versus the uncertainty of the long-term ones, and the anticipation of future technological solutions for long-term problems (MacKenzie 2016a). Beyond these general arguments, reasons for short-termism of political systems were identified in the specific motivations of political actors, voters, politicians, and special interest groups and in the objective absence of future generations (MacKenzie 2016a).

In order to correct short-termism, a range of institutional solutions with an assessment of their effectiveness were presented (MacKenzie 2016a: 31), which could bind political actors to a long-term policy view or that could provide representation to future generations. The variety of institutional design solutions proposed, and their relative effectiveness with regard to different subjects, not only confirms the complexity of the problem, but also implies that a combination of different solutions might be the most effective in limiting short-termism and therefore in warrantying a degree of intergenerational equity, especially in response to long-term complex problems such as climate change (MacKenzie 2016a).

Attempts to rank the efficacy of different systems have also been carried out by other authors (Dirth 2018), who have ranked different institutional design solutions based on five qualities: independence, legitimacy, feasibility, accountability, and normative significance. These qualities were defined (Dirth 2018: 20–21) respectively as an institution which is not dependent or managed by another institution, which has the authority to intervene in the legislative process, which is accepted and supported by its context and thereby enabled to carry out its purpose in a sustainable fashion, which is accountable for its actions, therefore serving through enacting its norms in a transparent way, and, finally, which is capable of upholding the normative principles that underpin it.

Both the described approaches (Dirth 2018; MacKenzie 2016a) could provide a benchmark to assess different solutions, although it appears that the criteria chosen are susceptible of being defined in different ways. Moreover, the institutional designs that could be examined are partially undetermined and could be specified in a number of different variations, thereby making difficult to rank them. Empowering future generations and protecting them from short-term political visions is therefore necessary, but whatever institutions are chosen to do so, the following problems arise: "authorisation" and "accountability", which are compounded by the "epistemic problem" (Karnein 2016). Essentially, whatever agent should represent future generations, there is a problem of its authorisation and accountability because, clearly, future generations will not be capable of electing a body or holding its members in account for their decisions. At the same time, such institutions will be

confronted with the complex problem of anticipating preferences and wishes of the future generations, and they will need to foresee the impact of policies as well as of their interventions in the policy formation process.

The problem of legitimacy of representation, i.e. authorisation, is not one that can be solved by institutional designs; it entails the philosophical debate that we have partly represented in earlier sections. It may suffice to say here that between the philosophical approaches earlier introduced, Ubuntu appears as the most suitable to attributing a moral legitimacy to this kind of surrogate representation, i.e. a representation in which the representative does not have any electoral relationship with the represented (Mansbridge 2011). In fact, the collective communitarian vision of Ubuntu could be considered, as we argued, far reaching and therefore capable of including future generations.

This representation of future generations' interests might be delivered in multiple ways, but inevitably, all are to some extent prone to a problem of misrepresentation, including the dishonest or anyway inaccurate representation of the interests at stake. The combination of different systems might reduce the problem of misrepresentation. Certainly, a more radical solution—perhaps the only one capable of avoiding the dangers of misrepresentation—would be to promote a cultural shift that would reframe the goal orientation of individuals and society from the satisfaction of immediate individual needs and wishes of accumulation (typical of anthropocentric perspective) towards an ecocentric one, which would recognise the dignity of natural systems to be preserved (Naess 1973). This shift from the individuals' pursuit of personal satisfaction or even accumulation is perhaps better facilitated by the Ubuntu's vision that holds all forms of life, human and non-human, and the natural wolrd as interconnected and worthy of being cherished and protected (see Lenkabula 2008; Chuwa 2014).

Other constitutional designs, which were and are used, and some that have been proposed, present solutions that appear worthy of mention. A first set are constitutional laws which are used in several countries. Tremmel (2006b) presents 21 examples of constitutional clauses that specifically target environmental protection; the oldest was adopted by Italy in 1947, but the majority of them were adopted from the 1970s onwards and mostly by European countries with the exceptions of Uruguay, Argentina, Brazil, and South Africa. More recently, Dirth (2018: 46) found 42 constitutions bearing clauses that aim to protect the environment for future generations, although only five of these have a legally binding wording and only two, Bhutan and Ecuador, make explicit reference to "intergenerational equity". In the case of Bhutan, we know by reading the preamble of the Environmental Protection Act (Kingdom of Bhutan 2007), for example, that environmental protection is embedded in a cultural environment promoting the so-called "development philosophy" of "gross national happiness". This, in turn, might have its historical routes in the search of a harmony with nature deriving from the acknowledgement of having a "…need to create institutional mechanisms to protect its fragile mountain ecosystem" (Kingdom of Bhutan 2007: 6). The Ecuadorian case seems to be the product of a long cultural process of recognition of the indigenous culture, and its inclusion in the institutional foundations of the Republic of Ecuador is explicit in the reference to social diversity and to the concept of "Pacha Mama", the deity of mother

earth, revered by the indigenous people of the Andes, that is found in the preamble (National Assembly of Ecuador 2008).

The South African Constitution (Art. 24, RSA 1996: 9) makes explicit reference to rights of future generations: "Everyone has the right—(a) to an environment that is not harmful to their health or wellbeing; and (b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that—(i) prevent pollution and ecological degradation; (ii) promote conservation; and (iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development". Cleary, from the explicit reference to sustainable development and the date of the document (1996), we can assume that the constitution and specifically Art. 24 were largely inspired by UN documents and debates about sustainable development. Nevertheless, as several authors pointed (Mokgoro 1998; Metz 2011), Ubuntu's values could be considered as a major influence over the constitution; therefore, it is not unfounded to hypothesise that the cosmocentric (Chuwa 2014) or ecocentric (Lenkabula 2008) vision of Ubuntu could have had a role in influencing the layout of Article 24.

Whether these significant constitutional provisions for environmental protection and the benefit of future generations are actually having a significant impact is a matter of debate. Observing the Environmental Performance Index (EPI) of the Yale Center for Environmental Law & Policy (2018), we can observe that on 180 countries ranked worldwide, the earlier mentioned cases of Buthan, Ecuador, and South Africa ranked only 131, 87, and 142, respectively. European countries occupied the first 16 places of the rank with Switzerland, France, and Denmark leading. In this regard, these differences may not seem to reflect largely on the constitutional designs that are conceived to facilitate a high standard of environmental protection for current and future generation even in poorly ranked countries. Rather they might be attributable to the widely known environmental Kuznets curve (Kahn 2007), which describes how environmental degradation increases in developing economies up to plateau, corresponding to certain level of income per capita, before descending, thanks to programs of environmental protection that are then put in place and financed.

Clearly, constitutional clauses, despite being useful, might have a varying degree of efficacy, not only in relation to their wording, but also with regard to specific provisions that the constitution might make regarding the institutions that should enforce the specific principles aimed at protecting the environment and future generations. Further, we might consider general constitutional implementation issues and particularly the possibility of individuals and/or state institutions to challenge state legislations as unconstitutional. To be more specific, each individual state has a constitutionally established method of enforcing constitutional principles. Usually, these are enacted by constitutional courts that are called by other courts or institutions to settle controversies. It is safe to say that the more entitled subjects to appeal to a constitutional court there are, the more likely is that the constitutional provisions will be enforced.

Another institutional design that is credited of having the potential of addressing intergenerational justice is the ombudsman for future generations (Beckman and Uggla 2016; Jávor 2006). The ombudsman was first experienced in Sweden in the early nineteenth century, and in recent years, several countries have experienced this institution in relation to environmental protection, future generations, and sustainability. The ombudsman can investigate the actions of state institutions and can recommend a course of action to relevant institutions; in some cases, it can initiate litigation taking to courts institutions whose actions or deliberations are considered against the interests that the ombudsman should protect, or it can delay legislation.

Beckman and Uggla (2016) point out that, far from being a weakness, the lack of definitive legislative power or judiciary authority of the ombudsmen may be a way to circumvent the problem of democratic legitimacy of the institution; in fact, democratic legitimacy is considered to rest solely on elected institutions; thereby only these are regarded of being entitled with legislative authority. In reality, it could be noted that significant powers to abolish or amend legislation are attributed to non-directly elected or non-elected bodies in many democratic states, both in common law and civil law systems (e.g. in the UK and Italy). Therefore, it could be possible to argue that even the ombudsman institution, opportunely appointed, could hold such powers. Perhaps, the major drawback of this system could be that the ombudsman is an authority which is concentrated in a single person or a restricted number of individuals (if its role is carried out by a commission like it was in Israel): this would make the institution not susceptible of exercising through multiple subjects its internal control, thereby possibly willingly or unwillingly missing some relevant legislative issues. Finally, it is arguable that being nominated by the parliament would make the institution prone to fall into the control of the parliamentary majority and therefore would incur the risk of being in line with the government. This could happen, unless a qualified majority rule is used in order to guarantee the choice of an individual representing, to some extent, the parliamentary minorities.

The third main system for protecting future generations that has been proposed, and in some cases implemented (particularly through youth quotas), regards the possibility of altering the composition of the parliament creating quotas for individuals who are supposed to represent the interests of future generations (Dirth 2018). Youth quotas are one of the means that were used for this purpose, but as duly noted by Dirth (2018) and MacKenzie (2016a), they do not appear effective, primarily because young generations will not extend much in the future the consideration of current problems and secondarily because they might be concerned with present needs as much as adults. Another, arguably more effective solution is that proposed by Dobson (1996: 132–135), a system where the interests of future generations would be protected by, what he calls, a constituency of proxy electors and proxy elected representatives, both of which would belong to the environmental movement or "lobby" (Dobson 1996: 133). Dobson admits that the composition of this lobby would be hard to determine, and this last point, among others, might actually be the main problem with Dobson's proposal. Beyond that, there is also a matter of

democratic legitimacy: selecting a proxy electorate based on green attitudes clearly attributes a higher status to green lobby's members who would get to vote both for the general parliament and for the future generations' representation seats. Obviously, this is at odds with the principles of universal suffrage and ultimately of formal equality and procedural justice, indicated by several authors as founding principles of energy justice (see McCauley et al. 2013; Pellegrini-Masini et al. 2019b). In fact, energy justice, as it has been argued (McCauley et al. 2013), should be founded on the tenet of procedural justice among others, which implies the equal rights (formal equality) of all citizens to contribute to the process of formation of energy policies. Having a number of citizens that because of their belonging to the green lobby would get two votes for the parliament and twice the opportunity of standing as candidates clearly circumvents the principle of formal equality of citizens that is at the core of modern democracies.

Another noteworthy proposal of parliamentary representation of future generations, which could circumvent the problem of infringing the principles of formal equality and procedural justice, would be the one proposed by Mackenzie (2016b: 282–283) of a "general purpose randomly-selected chamber". This proposal entails the selection of citizens through a stratified random process suitable to adequately represent "each politically relevant group", who would act in the interest of future generations. This chamber would be an addition to the main chamber of the parliament, which would have "soft powers", i.e. the possibility of delaying legislation (albeit not indefinitely), the ability of proposing amendments to legislation, and the possibility of "holding government in account" (MacKenzie 2016b: 283). In some respects, this proposal is undoubtedly attractive, because it would offer the possibility, even for ordinary individuals not belonging to political lobbies, to join the parliament, therefore respecting radically the principle of formal equality and procedural justice. Nevertheless, it is also worth observing that problems might arise in polarised political communities, where it is imaginable that the randomly selected members of parliament would possibly coordinate their activities with those political groups of the elected chamber that show the highest degree of affinity with their political views. Secondarily, in countries with high levels of corruption, it is imaginable that ordinary citizens without structured political views might fall for offering their support in exchange for some benefits.

The last parliamentary design that we wish to mention is the sub-majority rule model of Ekeli (2016), who proposes that parliament's minorities could be given the privileges to advocate for future generations' interests. These powers would be essentially twofold: the first would grant to a minority of at least a third of the chamber to delay contested legislation up to the next election, while the second would allow the same minority to demand a referendum to submit the final decision about a contested bill to voters. While the rationale of Ekeli is clear, and the proposal's respect of citizens' formal equality is evident, the criticism that could be moved is that there is no guarantee that experienced politicians might not use these rules to score political points against their adversaries, even when these powers are allowed only for cases of legislative proposals regarding future generations. In fact, arguably, a vast number of bills could be considered to have some degree of consequences for future generations.

In this section of the chapter, we have attempted to discuss institutional solutions for establishing intergenerational energy justice. While it is clear that there is a wide number of solutions, a few overarching points can be made: (1) intergenerational energy justice would be most likely implemented through a variety of institutional designs that aim to represent future generations' interests with regard to all the state legislation affecting current societal issues; (2) a combination of different institutional designs might be preferable for overcoming the shortcomings of each single design; (3) considering that formal equality and procedural justice might be regarded as core principles of energy justice, it is arguable that any institutional design which aims to fulfil energy justice with regard to future generations would be chosen attempting to uphold these principles. In this respect, it could be said that constitutional clauses enforceable by the initiative of multiple actors and some of the parliamentary designs that do not advantage specific lobbies would embody these principles more than the institution of the ombudsman, unless a large qualified parliamentary majority elects the ombudsman. In this case, although being a secondary elected body, it could be considered as having a reasonably wide democratic legitimacy.

13.5 Conclusions

The question of how future generations should be included in the group of individuals whose rights and duties should be taken into consideration in energy justice cannot be answered in a simple way. As we have seen, the philosophical underpinnings of future generations' rights face significant challenges. The various branches of contractualism struggle to find a coherent formulation of an intergenerational contract that both fits with our considered intuitions on human motivation and the plausibility of the contractual metaphor. The Ubuntu concept of a shared community, which is for many scholars intuitively fitting for human social relations, cannot circumvent trade-off situations and does not provide processes for managing such trade-offs.

Despite the weak arguably philosophical underpinnings of our chapters, our intuitions are relatively stable. It is few who deny that future generations have some moral worth and that our contemporary actions need to take this worth into account. There are several concrete policy proposals to make our institutions more adaptable to the challenges of long-term complex issues such a climate change. It is thus reasonable to say that the main problem facing intergenerational equity's implementation is not exclusively a philosophical problem, but also a policy one. Despite it being evident that there are problems in the philosophical conceptions of intergenerational justice, it is nevertheless difficult to trace any substantial stance against intergenerational justice in the academic literature, if not perhaps in some minority positions taken by radical contractualist libertarians, who disavow any rights of future generations, because they are considered simply as non-existing subjects. Therefore, in the presence of a reasonably wide agreement in academic and policy circles towards the need of protecting the rights of future generations, demonstrated also by the widely recognised UN sustainable development goals (UN 2015), the main hurdle for implementation rests on the choice of the most

effective institutional designs to achieve it. The effectiveness of this might change across different geographical and therefore cultural environments.

The choice of the most effective designs might be a complicated one and to some extent might be also linked to peculiar cultural-political environments. As we observed earlier, a combination of several institutional instruments might be the one that is most likely to deliver some degree of success. What perhaps can be stressed here is that the mere presence of institutional instruments devoted to ensure some degree of protection of future generations' environmental rights is far from being a guarantee that this protection will actually be implemented. A matter that might be paramount is to ensure an effective implementation with regard to the issues of agency and legitimacy of those who can exercise the actions necessary to protect those rights. This point also holds true to the philosophical underpinnings of such institutions. That a concept such as Ubuntu can be used to justify care for future generations does not clearly correlate to actual care for those generations. If a contractual interpretation of our responsibility towards future generations is more in tune with public sentiments and motivates this public to take concrete ways for protecting future generations, there is a pragmatic case in support of this interpretation.

Finally, the relation of specific institutional instruments with the legislative and the judiciary powers is important, as is their ability to hold governments in account. Therefore, broadening the agency base of the actors capable of initiating actions to defend future generations' rights and, at the same time, affording full legitimacy to the institution(s) that should enforce those rights, whether embedding it (or them) in the recognised legislative and/or judiciary powers, seem to be the only choices that could maximise the likelihood of and effective protection of future generations.

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Chapter 14
Exploring Marginalization and Exclusion in Renewable Energy Development in Africa: A Perspective from Western Individualism and African Ubuntu Philosophy

Yekeen A. Sanusi and Andreas Spahn

Abstract   The objectives of this chapter are to understand the ethical principles that are relevant to the achievement of energy justice; to explore energy marginalization in Africa and to analyse this marginalization from the perspectives of Western and Ubuntu ethics; to underscore the violation of ethics in renewable energy deployment; and to find means of addressing energy injustice through proper application of the respective ethical principles. Part of the data for the study were sourced from the reports of the Renewable Energy for Twenty-First Century (REN21).

14.1   Introduction

The critical role of energy in development is not in doubt. Life itself and human activities including economy are energy-driven. Although energy is not seen as a basic need, it is true that access to basic needs is 'closely connected to the price and availability of energy' (Kimmins 2001). This also partly explains the position that energy occupies in the UN Sustainable Development Goals (SDGs). The Goal 7 is to ensure access to affordable, reliable, sustainable and modern energy for all. This goal is a justice matter. The world is in a global energy transition from fossil fuel-based to renewable source-based. The renewable option is clearly favourable to most countries of the world but in particular to the developing countries where like in most other situations, people are underserved with desired energy. Sovacool et al. (2017) raised concern over energy dilemma, having too much resulting in

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environmental and social burden on one hand and not having enough indicating lack of access to modern forms of energy services, underconsumption and poverty on the other hand.

The contrasting situation in energy in Africa and Europe is shown by BP Statistical Review (June, 2017) and Akizu-Gardoki et al. (2017). For example, in 2015, while Europe and Eurasia accounted for 29.8% of world's consumption of natural gas, Africa accounted for 3.88%. Similarly, in the case of hydroelectricity consumption, while Europe and Eurasia accounted for 22% of total world's consumption, Africa accounted for 3% (BP Statistical Review, June, 2017). Reports show that in 2014, the annual rate of energy extraction stood at 159,320.85 TWh. Out of this, fossil fuel accounted for 86.36%. Although the global annual average energy consumption per capita was 22 MWh, Africa consumes 35%, less than the world average (Akizu-Gardoki et al. 2017). Against these backgrounds, the global energy transition to renewables is a welcome development particularly for the countries experiencing underconsumption of energy.

The objectives of this chapter are to understand the ethical principles that are relevant to the achievement of energy justice; to explore energy marginalization in Africa and analyse this marginalization from the perspectives of Western and Ubuntu ethics; to underscore the violation of ethics in renewable energy deployment; and to find means of addressing energy injustice through proper application of the respective ethical principles. Part of the data for the study were sourced from the reports of the Renewable Energy for Twenty-First Century (REN21) for 2015, 2016 and 2017 and from reports of other similar global agencies on renewable energy.

This chapter combines two disciplinary perspectives: the part about the West is written from a philosophical perspective; the African part is written from the perspective of urban planning. This leads to a different emphasis. In the part on Western philosophy (3) and its application to energy marginalization in Africa, the focus is on the elaboration of the ethical concepts of the West and how they relate to energy ethics and marginalization while in the third section (4), the emphasis is on the African philosophy of Ubuntu and its application to identification of renewable energy marginalization in Africa. Future research is needed on both levels to deepen the comparison on the conceptual level of western and African philosophy and religion and on the level of factual differences in the stakeholders and types of marginalization.

We emphasize that the data used in this study relate to broad national and continental levels. The simple assumption here is that these broad pictures provide average experiences of the various communities in renewable energy. There is no doubt that there are variations in these experiences within each country; however, this chapter is not concerned with detailed community level marginalization. Broadly and as emphasized in our analysis, energy marginalization has been examined in order to compare deployment of renewable energy of the African continent in relation to global experience, the experiences of other continents and then the experiences among the African countries.

14.2 Marginalization in African Renewable Energy

Marginalization is a situation where disadvantaged groups struggle to gain access to resources and full participation in social life (Anderson and Larsen, 1998 cited by Gurung and Kollmair 2005). It is seen as 'both a condition and a process that prevents individuals and groups from full participation in social, economic, and political life enjoyed by the wider society' (Alakhunova et al. 2015). According to Gurung and Kollmair (2005), there are two forms of marginalization: social and spatial. Social marginalization relates to the human dimension, while spatial marginalization relates to physical location and distance from the centre. Being at the margin puts the subject in a peripheral position where he is deprived of the good things from the centre. Hence, marginalization is a process of becoming peripheral and follows 'centre-edge analogy, in which actors at the edge are disempowered in comparison to actors at the centre, who are privileged and socially dominant' (Trudeau and McMorran 2011). Bernt and Colini (2013) interpreted marginalization as a process of peripheralization to denote 'a multidimensional process which includes economic (deindustrialisation, restructuring), social (impoverishment, discrimination, stigmatization) and political (exclusion from decision-making, dependence) phenomena and leads to the emergence of peripheries characterized by dependence, disconnection, poverty and outmigration'.

With reference to renewable energy, Sanusi (2017a) sees marginalization as 'a situation where territories that have the renewable resources at their disposal fail to key into the global drive of renewable energy deployment and therefore remains outside the drive of the renewable energy system'. Energy marginalization stands to violate most ethical systems. Marginalization is associated with exclusion. Thus, people who are marginalized could not have been included in the respective development activities. Exclusion represents a particular form of deprivation. Mowat (2015) saw marginalization as contextually related, and from the marginalized, Mowat (2015) also posited that marginalization is 'to feel, and be, excluded'.

The marginalized, excluded and deprived could not have said to experience a fair deal from the society, and from the ethical point of view, they remain 'not part of us' where the 'us' is the part of the society that has a fair deal of the command over resources, power, protection, patronage and favour. The energy marginalized is the energy excluded and suffers the disadvantages associated with this form of ill-being.

To illustrate the problem of energy marginalization in Africa, it is important to look at the relevant data. Table 14.1 shows the renewable energy capacity of Africa with regard to solar energy, wind energy, concentrated solar power and hydropower. It is seen that from a low base of 54 MW in 2006, solar energy capacity grew to 2491 MW in 2016. Significant increase started in 2014 when 1000 MW was exceeded. In the same manner, wind energy capacity increased from 386 MW in 2006 to 3786 MW in 2016. In terms of concentrating solar thermal power, African recognizable production started in 2014 when 65 MW capacity was achieved. The production rose to 425 MW in 2016. Hydropower capacity increased from 23,623 MW in 2007 to 27,657 MW in 2010 to 30,111 MW in 2015.

Table 14.1 Renewable energy capacity of Africa in solar, wind, CSP and hydropower

| Year | Renewable technology in MW | | | |
	Solar[a]	Wind[a]	CSP[b]	Hydropower
2006	54	386		
2007	78	469		23,623
2008	95	639		24,087
2009	138	819		25,317
2010	223	906		26,611
2011	331	1037		26,648
2012	409	1266		27,657
2013	689	1737		28,275
2014	1518	2455	65	28,737
2015	1653	3381	355	30,111
2016	2491	3786	425	33,524

Source: [a]BP Statistical Review of World Energy, June 2017. [b]REN21 2017

Table 14.2 Comparing African and global renewable energy capacities, 2016

| Renewable technology | Capacity in GW | | Africa as percent of world |
	World	Africa	
Solar PV	303	2.491	0.82
Wind	487	3.786	0.78
CSP	4.8	0.425	8.85
Geothermal	13.5	0.676	5.00
Hydropower	1096	33.524	3.05
Total RE with hydro	2017	40.902	2.03
Total RE without hydro	921	7.378	0.80

Source: REN21 2016

Report by Bertani (2015) shows that Africa's geothermal output increased from 45 MW in 1995 to 136 MW in 2005 and to 601 MW in 2015. The capacity increased to 676 MW in 2016 (BP Statistical Review of World Energy 2017). In terms of the relative contributions of the renewable technologies, Bertani (2015) also showed that hydropower is clearly the leading renewable energy provider in the continent, contributing nearly 82% of the renewable energy capacity of the continent. On the other hand, geothermal and CSP contribute less than 2% to the continental capacity.

Table 14.2 shows the capacity of Africa in renewable energy development against the global capacity in 2016. Africa's contribution to global capacity in all the five renewable technologies is less than 10%. It is very poor in the case of solar PV and wind where Africa's capacity is less than 1% each. The marginal position is also seen in hydropower generation where the continent contributed about 3% to global capacity in 2016. Overall, Africa's contribution to global renewable energy capacity was only about 2% in 2016.

The marginal position of Africa in renewable energy can be further seen in relation to the contributions of the other continents. This is seen in the case of wind energy as shown in Table 14.3.

Table 14.3 Installed capacity of wind energy among the world regions

Region	Capacity over the years in GW						
	2010a	2011b	2012c	2013d	2014d	2015	2016
Europe	86.3	96.6	109.817	121.5	134.0	147.8	161.3
North America	44.2	52,7	67.748	70.8	78.1	88.7	97.6
Asia	61.1	82.0	95.715	116.0	142.0	175.8	203.7
Latin America	2.0	2.3	3.530	4.8	8.5	12.2	15.3
Pacific	2.4	2.9	3.2	3.8	4.4	4.8	5.0
Africa and Middle East	1.1	1.1	1.2	1.6	2.5	3.5	3.9
	197.1	238.0	283.2	318.6	369.7	432.9	486.8

Source: Global Wind Energy Council 2011, 2012, 2013, 2014, 2015, 2016

Africa has the least capacity among the six continents shown in the table. However, while Latin America has pushed ahead to generate 12.2GW in 2015 and 15GW in 2016, Africa's wind energy capacity remains well below 5GW. The Pacific is doing well above Africa. A similar picture is seen in hydropower generation which should have given Africa an advantage given its enormous potentials in hydropower. In 2016, Africa contributed about 3% of global hydropower capacity as opposed to 16.1% from North and Central America, 13.2% from South America and 18% from Europe (International Hydropower Association 2017).

In addition to the intercontinental marginality observed, records also show that the contributions to renewable energy progress in Africa come from a few countries. This runs through all the renewable energy technologies.

As shown in Table 14.4, out of the 54 countries in Africa, 15 are the major producers of renewable energy in Africa. These interchange the top five positions in six renewable technologies. As the table shows, South Africa is in first position in four of the six renewables, wind, solar, CSP and biogas, while Ethiopia is first in hydropower and Sudan, first in bioenergy. Indeed, even in these other two, South Africa came second. The emerging picture is that South Africa is the renewable energy super power of the continent. In each of the six renewable sources of energy, the top five countries have commanding control in the African capacity. The combined output in each of the six renewable energy types is shown in Table 14.5.

In the case of wind, the top five countries have a combined output of 3637 MW representing 96% of the Africa total capacity. A similar situation is seen in biogas where the combined output of the top five represents 94% of the total continental capacity. It is an absolute possession by the top five in the case of CSP where all the 429 MW are from the top five countries. It is only in the case of hydropower that the top five generate less than 50% of the total continental capacity (46%). On the whole, about 80% of the renewable energy capacity of Africa is provided by the top five countries. However, the five countries do not necessarily constitute the most populous countries in each of the six renewables. The first five countries in solar energy have a combined population of 27%, 24% in wind energy and only 9% in the case of bioenergy. The table also shows people who are marginalised in this preproduction pattern. The marginalized population is as high as 91% in the case of

Table 14.4 Summary of top 5 renewable energy generating countries, 2016

Renewable technology	Top countries				
	1	2	3	4	5
Wind energy	South Africa	Egypt	Morocco	Ethiopia	Tunisia
Hydropower	Ethiopia	South Africa	Egypt	Democratic Republic of Congo	Zambia
Solar	South Africa	Algeria	Morocco	Egypt	Ethiopia
CSP	South Africa	Morocco	Algeria	Egypt	
Bioenergy	Sudan	South Africa	Swaziland	Zimbabwe	Mauritius
Biogas	South Africa	Reunion	Mauritius	Kenya	Morocco

Source: Sanusi 2017a

Table 14.5 Combined capacity of top five in renewable energy technologies compared to Africa's total capacity and population

Renewable technology	Combined capacity of top five countries (MW)[a]	Proportion of Africa capacity	Combined population (2016)[a]	Proportion of African population	Proportion of African population excluded from major players	Proportion contributed by South Africa
Wind energy	3637	96	296,408,034	24	76	38
Hydropower	15,318	46	271,674,073	23	77	11
Solar	2288	78	325,388,765	27	78	60
CSP	429	100	223,565,500	18	82	47
Bioenergy	656	64	114,702,780	9	91	14
Biogas	34	94	139,193,094	11	89	61

[a] Source: Sanusi 2017a

bioenergy and 82% in the case of CSP. In general, the top five countries in the six renewables represent about 18% of the African population while 82% are marginalized. The marginality can also be seen in the fact that the dominance of South Africa cuts across the renewable technologies. Its single contribution represents 61% of African capacity in the case of biogas and 60% in solar energy. Overall, South Africa provides about 39% of Africa total renewable energy capacity. On the other hand, South African population is only about 5% of the African population. The emerging marginalization is reflected in the overall access to energy by Africans. Records from REN21 annual renewable energy reports show that access to electricity has remained below 50% over the years, standing at 43% in both 2012 and 2013 and increased only marginally to 45% in 2014. But the situation is poorer in Sub-Saharan Africa as opposed to North Africa where electricity coverage is 99%. On the other hand, electricity access has been below 40% in SSA, 32% each in 2012 and 2013 and 35% in 2014 (REN21 2015, 2016, 2017). So, while it is true to say that Africa is on the margin of energy development and access, it is more true to say that SSA is grossly at the margin of this process.

14.3 Western Individualism: Nature, Humans and Society in Western Perspective

On the most basic level, the ecological crisis points at a fundamental problem in the relation between human beings and nature (Hösle 1994; Spahn 2018). We overuse our resources, we pollute the environment, and we are affecting the world climate negatively, rather than living in harmony with nature. The crucial philosophical categories, which are at stake, are thus our understanding of *nature*, or understanding of our duties and our freedom as *individuals*, and the role of the communities or *societies* we live in. Object, subject and intersubjectivity and their philosophical interpretation are the three key categories that we will use to structure our analysis of Western philosophy and its view on marginalization.

We will first explain these three categories with the help of an interpretation of the history of philosophy by Karl-Otto Apel and Vittorio Hösle (Apel 1973; Hösle 1987), which is inspired by Charles S. Peirce's objective idealism. The main claim will be that the categories objectivity, subjectivity and intersubjectivity are central categories in Western philosophy that receive fundamental attention in the unfolding of the history of Western philosophy (3.1). Secondly, we will analyse how the West arrived at a very peculiar interpretation of the three categories of nature, individuals and society (3.2) and how these in turn shape environmental ethics and the discourse on marginalization as seen in the West (3.3).

14.3.1 Object, Subject and Intersubjectivity as Paradigms of Western Philosophy

Historically, Western philosophy rests on two pillars: the tradition of Greek philosophy and the influence of the Judeo-Christian religion (Libbrecht 2007). It is equally true that over the recent centuries the West has become a highly secularized culture, even though within the secularised West, many Christian ideas still live on (Taylor 2007). We will argue that the West has a very specific understanding of nature, individuality and society, which distinguishes its worldview from other cultures. This thesis has a historical and a contemporary systematical perspective.

Historically speaking, it has been argued that Western philosophy moves from a position of harmony and unity of humans and nature (in Greek antiquity) to a sharp dualism of *res cogitans* (humans or 'subjects') and *res extensa* (nature or 'objects') in modernity with the birth of Cartesian dualism (Jonas 1984; Hösle 1994).

For the history of philosophy, Hösle and Apel have defended the idea that 'object', 'subject' and 'intersubjectivity' form key categories of different historical epochs: In Greek antiquity and early medieval Christian thinking, the *prima philosophia* is metaphysics or ontology. The quest of philosophy is to understand the fundamental principles of the world either as the harmony and logos of the cosmos (in the Greek interpretation) or as the Divine logos and its relation to its cre-

ation (in Christianity). With early modernity, we find a remarkable shift from the 'object' and ontology towards the discovery of modern 'subjectivity'. For Descartes, the evidence of the *cogito* is the starting point of philosophy; the main ontological division is the above-mentioned dualism between subjects (res cogitans) and objects (res extensa). Philosophy now starts from the subject, since knowledge about the outside world is fallible and might be illusionary. That I exist is, however, certain according to Descartes and can thus serve as *fundamentum inconcussum*. This turn towards the subject leads to the fact that epistemology becomes a more prominent discipline within philosophy: metaphysics is slowly replaced by a reflection on the knowledge claims of the subject as in Kant's Copernican revolution.

This shift prepares two influential Western ideas: the notion of the subject as 'rational agent' and the sharp dualism between subjects and (value-free) objects. Science takes on it the task to *explain* the realm of nature in a value-free, quantifiable mechanical way (in contrast to prior metaphysical or religious interpretations of the world); the humanities emerge as a counter-point to *interpret* the products and activities of human societies. The emergence of the humanities and the social sciences prepares the third paradigm according to Apel and Hösle: the paradigm of intersubjectivity with the discovery of the inner logic of societal relations, as in, e.g. *Marxism*, *hermeneutic philosophy*, *pragmatism* and the *linguistic* turn of analytic philosophy (Hösle 1997; Spahn 2008). All of these very different schools of thoughts have in common, that the rational subject is no longer seen as the central category of philosophical inquiry, but is being replaced by a turn towards intersubjective dimensions. Marxism and critical theory focus on societal relations; analytic philosophy soon emphasizes the importance of language (and thus intersubjective thought instead of individual rationality); pragmatism emphasizes the embeddedness of the individual in a societal context—a thought we also find prominently in continental philosophy from Heidegger's *Mitsein* to Foucault's analysis of the societal power relations.

The aim of this chapter is not to challenge these theses about the history of philosophy, but to use it as a starting point for an analysis of these three central categories insofar as they are relevant for our context.

14.3.2   *'How the West Was Won and Where It Got Us': Nature as Physical Objects, Individuals as Rational Utility Maximizers and Society as Social Contract*

In what follows, we aim to pick out three ideas that we regard as significant and prominent assumptions made in the West. It goes without saying that this summary is an oversimplification. The aim is not to render justice to the different approaches within the West to topics as broad as the interpretation of nature, the self-understanding of mankind and the quest on how to organize society. We rather aim to highlight those ideas that can be seen as typical for the West, certainly in line with Western Individualism and Western Rationalism.

All of these ideas are contented, even within the West. But nevertheless, they point to core assumptions that are shared by many prominent 'classical' thinkers of the West. We will summarise the three key ideas as three interpretations: 'nature as value-free resource', 'human individuals as autonomous, rational utility maximizers' and 'societies as social contract of rational individuals for common benefit'.

Nature as Value-Free Resource

The view on nature in the West changes from Greek ontology and the Christian worldview towards a modern scientific interpretation that underlies a modern naturalistic understanding of the world. In this modern view on nature, several key ideas are relevant.

Since Descartes, nature is regarded as the collection of value-free extended objects in space and times. Highlighting 'extension' as the key feature implies that nature can be quantified. This allows for the application of mathematics to nature, especially in *physics*. This way perceived qualities (e.g. 'colours') can be transformed into quantities ('wavelength') (Jonas 2001; Husserl 1994). It has been argued that this ontological picture of nature goes hand in hand with a de-evaluation of nature in ethics: nature in itself is value-free; it is only humans who possess intrinsic value and can value things (Hösle 1994). In the mechanistic worldview, animals are mere complicated machines that do not have any intrinsic value. We find echoes of this in Kant's reflections on the moral treatment of animals. While the ancient worldview has interpreted *biology* as a teleological harmony and could thus give ethics and virtues a rooting in biology; this seems no longer possible in modernity. Modern Darwinian biology rather tends to see nature as a struggle for existence. Ethics slowly loses its link to metaphysics and ontology (Jonas 2001; Ballet and Bazin 2017).[1]

It has been argued that this de-evaluation of nature has been prepared by Christian Monotheism. On the one hand, understood as 'creation' by God, nature can be seen as valuable, and humans can be regarded as the steward of nature; environmental ethics could thus be based on religious grounds (Carvalho 2015; Biviano 2018). On the other hand, if God is transcendent and 'outside' of nature, his 'creation' can be understood as organized according to rational principles and as a domain over which humans can reign as they see fit (Passmore 1980).

Heidegger has famously sketched this modern view of nature in his essay on the *Question Concerning Technology* (Heidegger 1977). His main argument is that the modern scientific worldview regards nature as a mere resource ('Bestand') that we can exploit as we like. We see in Heidegger—as in early environmental philosophy—criticisms of this Western conceptualisation of nature and attempts to re-

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[1] This tendency might be strongest within deontology; modern virtue ethics still uses the notion of flourishing and can thus cover animal welfare. Similarly, the capacity to experience happiness is common to humans and animals, so that utilitarianism can more easily be applied to non-humans.

evaluate nature to overcome the Cartesian dualism and the disregard for the value of nature (Sylvan 1993; Lee 1994).

In summary, nature is seen as a realm of value-free objects that can be studied with the help of observation and quantification and be put to use to fulfil the needs of humans. The advantages of such a worldview are obvious: sciences allowed us to drive technological progress, which in turn has helped us to improve the conditions of life dramatically. On the other hand, this view of nature has been criticized, because it de-evaluates nature and might lead to over-exploitation and pollution of natural resources.

Humans as Rational Utility Maximizers

The main starting point in the West is to focus on the fact that human beings are 'rational —agents'. The Greek philosophy emphasizes the importance of logical argumentation and a taming of the passions and emotions with the help of reason. For the Christian worldview, the soul is immortal and linked to our capacity to think and follow reason, whereas the body is mortal and linked to our impulses and emotions and/or desires that must be controlled. The tendency to give reason predominance in ethics over emotions is probably most clearly visible in Kant's attempt to base ethics on a theory of practical rationality.

It has often been argued that the scientification of the worldview has narrowed down the interpretation of nature from a cosmic harmony or a divine creation to a (value-free) interaction of casually interdependent matter and energy. Max Weber has famously called this process the disenchantment of the world in western. A similar reduction happens in the notion of rationality. For the Greek, the highest principle of rationality was wisdom, which combined a practical knowing-how to achieve something with a moral knowing whether it was worthwhile or valuable to strive for the thing in question (Mitcham 1994). For the Greek, the logos was furthermore also the principle of cosmic harmony and not just a mere human capacity of reasoning. For Kant, reason was both connected to science and theoretical philosophy (that discovers how the world is descriptively), but it could also answer which ends you should strive for morally. The distinction between a strategic rationality ('if you want to do x, you should do y!') and a communicative rationality ('we jointly agree that we should strive for value v') is still visible in Habermas (1987).

On the other hand, we find a narrowing down of rational behaviour as referring to either strategic or hedonic behaviour. This is especially the case in the context of economical or psychological theories: a person is rational if she can use the right means for her ends. Furthermore, a person might also be called irrational if she chooses ends that harm her and she thus ignores and/or endangers her own wellbeing. A rational agent is thus supposed to strive to maximize her happiness (or utility). Altruistic behaviour appears as irrational (or as rational only insofar as altruistic behaviour also makes the agent happy). In utilitarianism and game theory alike, western rationality is too often identified with utility maximization. It has been

argued that the focus on rationality at the extent of human emotions and the reduction of rationality to strategic rationality are problematic tendencies in the West.

While that is a plausible criticism, there is on the other hand a valuable insight linked to Western Individualism, namely the idea of a fundamental equality of all humans and a strong focus in political theory on human rights that are non-negotiable (2017). As human rights point towards the sphere of the political, we will come back to them in the next section.

To summarize, Western rational Individualism has brought forth the idea of a fundamental equality of humans, a focus on freedom and human rights and a quest to base (ethical) decisions on reason and the strength of the better argument. The advantages of these ideas seem obvious. On the downside however, one can argue that other aspects of human nature, such as emotions and biases, have been neglected. Finally, the definition of rationality as strategic rationality has endangered the project of a rational ethics that goes beyond preference coordination and maximization. The downsides of this will be particularly valuable if one looks at the interpretation of society.

Society as Social Contract

One of the most interesting contribution of Western philosophy to the interpretation of the relation of society and individuals is the concept of human rights. As seen above, the individual is the highest category in ethical theory and has basic fundamental rights that must be protected by society. The concepts of human rights might be based in different ethical traditions, ranging from ideas of moral agency and human dignity in the context of deontology or in the idea of the striving for happiness in utilitarianism or virtue ethics. In the political and legal domain, it has led to a shift from status-based societies, where the position you hold in the society determines your societal rights, to an interpretation of the society as a contract of equal individuals that enjoy in principle the same moral status and universal rights (Maine 1996; Donnelly 2013).

It is therefore no surprise that political philosophy, including ethics of technology and energy ethics, often takes the form as a subpart of a theory of justice (Pols and Spahn 2014; Sovacool 2013; Sovacool and Dworkin 2014, 2015). If we interpret society as a relation between rational free agents, then most political problems can be framed as questions of fair distribution of benefits and burdens (material justice) or as questions about how to establish a fair and transparent decision making about these distributions (procedural justice).

The ideas of justice, a social contract and human rights are thus important contributions to political philosophy. However, social contract theories that interpret the sphere of the social as rooted in the contract of rational utility maximizing individuals also have their limits (Hösle 2004; Beyleveld et al. 2015; Spahn 2018). As game theory shows, the coordination of utility maximization may lead to prisoner's dilemmas. It is not always possible to reduce the social good to the effective coordination of extended self-interests. This is particularly true in the case of sustainability (Care

2000; Gardiner 2001). It is thus not surprising that next to Western Individualism, philosophers have tried to highlight the role of community values (in, e.g. communitarianism) or the importance of virtues that got lost in the process of modernization—a critique that goes back all the way to the romantic reaction to enlightenment in Rousseau and finds its peak in Heidegger's critique of the logo-centric West (that then gets elaborated by his post-modern followers).

For our context, two shortcomings of the social contract theory in political philosophy are relevant. First, it ascribes values only to humans; the idea of an intrinsic value of nature is alien to many modern thinkers. This is the famous criticism of early environmental ethics and deep ecology (Sylvan 1993). Second, future generations cannot interact with current generations; they have no way to alter the social contract towards their needs. It remains an open question how to best incorporate their needs in the economic market, as their demands do not affect prices, and how to incorporate their rights into current policies, as future generations cannot affect the outcome of elections (Hösle 1994; Beyleveld et al. 2015). We will analyse next how the downsides of these influential ideas—nature as a mere object, humans as rational egoists and society as a contract—affect marginalisation and energy ethics.

14.4 Ubuntu and Energy Marginalization in Africa

In this section, the African ethical philosophy of Ubuntu and its relevant concepts for understanding energy marginalization in the continent are explored.

14.4.1 Understanding Ubuntu Ethical System

Ethical systems 'specify life's basic values and appropriate means to achieve them' (Verharen 2011) and are concerned with fairness, the bedrock of justice. In respect of Africa, Munyaka and Motlhabi (2009) see this as value systems, beliefs and practice that reflect the African worldview, while Mangena (2016) sees it as 'the guiding injunctions as well as the norms and values peculiar to the communities of Africa'. In Africa, the most abiding principle of this worldview is Ubuntu which represents a philosophy and way of life that has sustained African communities for many centuries (Munyaka and Motlhabi 2009). Broader image captured by Ubuntu ethics is seen in the descriptions by Munyaka and Motlhabi (2009):

> Ubuntu is more than just a manifestation of individual acts. It is a spiritual foundation, an inner state, an orientation, and a disposition towards good which motivates, challenges and makes one perceive, feel and act in a humane way towards others. It is a way of life that seeks to promote and manifest itself and is best realised or made evident in harmonious relations within society.

The central theme of Ubuntu is the idea of being human and the idea of community. It is a worldview or philosophical approach to human relationships that elevates the importance of human and shared community (Brubaker 2013). It is a complex concept with the duo of humanity and community (Arthur et al. 2015; Mangena 2016). It derives strength from the Bantu maxims: *Umuntu ugumuntu ngabanye abantu* (Hailey 2008) or *matho le motho ba bangwe or umuntu ugumuntu ngabantu* (Mokgoro 1997). These phrases share the meanings of a person is a person through others, or a human being is a human being through human beings or a person can only be a person through others. All these affirm the unity of the individuals within the community.

According to Jolly (2011), Ubuntu is a belief that a person is a person through other persons, that my humanity is caught up, bound up, inextricably with yours. When I dehumanize you, I inexorably dehumanize myself. Put differently, humanity is only complete if it re-affirms that of others (Chibvougodze 2016). The product of Ubuntu is humanity and humanness within the broader image of the community resulting in 'persuasive spirit of caring, and community, harmony and hospitality, respect and responsiveness that individuals display to one another' (Hailey 2008).

Mangena (2016) showed that there are both geographic and linguistic sources to Ubuntu. Geographically, it is said to have originated from Egypt through interregional interactions and is seen in the Egyptian word 'ma'at'. So it might have been corrupted to read *muthu*, *umuntu*, *botho and munhu* in Bantu. Ma'at represents highest good. From linguistic point of view, Ubuntu originated from Bantu speaking people of Southern Africa. The suffixes *utu*, *tho* and *nhu* suggest that they (the suffixes) have the same linguistic roots (Mangena 2016). In the account of Ramose (2002), Ubuntu is the fundamental ontological and epistemological category of African thought. While *ubu*, generalized understanding of being, is ontological, *mbu*, the nodal point at which being assumes concrete form or a mode of being in the process of continual unfoldment, is epistemological.

14.4.2   The Relevant Concepts of Ubuntu Ethics

In our presentation of the relevant concepts, we follow the categories 'nature', the 'individual' and 'society' that have been used above to characterize western ethics. This way the differences and similarities of the two traditions become visible. The relevance of Ubuntu ethics to energy discussion is seen in its basic concepts of community, communitarian, participation and inclusiveness, human rights, relationship and the unity of nature (environment).

Unity of Nature

Africans 'conveniently utilize the cultural beliefs and norms embedded in taboos, totems and proverbs to promote human tolerance of plants, animals, mountains and rivers' (Chibvougodze 2016). In the Ubuntu concept, 'The environment is part of the communitarian concept of life' (Norren 2014). There is the concept of communal ownership of resources. Norren (2014) also discussed the concept of Seriti (aura). This is seen as 'not only a personal field, but also as a field which connects all living beings'. In Ubuntu's web of life, humans, other living things and animated natural objects are all related (Norren 2014). The unity of the community extends to unity of nature reflecting comic harmony based on the tripartite relationship of the human, natural and spiritual. 'All people including elements of the natural environment possess a life/vital force and all forms of life are related. Indigenous people see themselves as part of the whole (the group and the environment) belonging to it are complimenting other entities' (Mkabela 2015). The conservation of the environment is part of Ubuntu with the primary objective of maintaining the integrity of the connective life force, the collective (Mkabela 2015). The conservation of the environment is seen in the meshing of clan identities with that of the animal names as a means of communal commitment to conservation of animals. For example, among the Shona people of Zimbabwe, there are clan names such as Mhofu (Eland), Samanyanga (elephant), Simboli (leopard), Shamba (lion) and Dube (Zebra). Hence, 'it is the collective duty of the clan bearing the name of the animal to keep that animal from harm and extinction' (Chibvougodze 2016). We can see, thus, that in contrast to the West, nature plays a more dominant role in Ubuntu ethics and the relationship between humans and nature is emphasized more. This is in contrast to the idea of nature as 'value-free resources' (see above), but in line with attempts in the West to revitalize the value of nature (as in deep ecology).

The Individual: The Importance of Human Rights

Similar to Western philosophy also, Ubuntu recognizes the importance of the individual and individual rights. These concern the following.

Freedom of expression: The individuals within the community have a right to freely express themselves, and the leaders provide the listening ears and provide summary of various viewpoints in order to arrive at group consensus. In Ubuntu, all persons are equal; 'no one is superior or inferior in humanity' and holds the sanctity of life supreme (Munyaka and Motlhabi 2009). It affirms equality of people. In Shona, Zimbabwe, it is stated that 'men are all the same, when their beards burn they help each other to extinguish the fire' (Mandova and Chingombe 2013).

Equality of persons: Irrespective of differences between people, 'persons are recognized, accepted, valued and respected for their own sake' (Munyaka and Motlhabi 2009). Equality is guided by the concept of *U-Ukulu-Ukulu*, the greatest of the great, the ineffable; the ineffable is neither male nor female. If it is genderized at all, it is 'female-male' (Ramose). Right to dignity of all persons is embedded in Ubuntu.

For example, Munyaka and Motlhabi (2009) state that by the Ubuntu ethic, all people have *isidima* (dignity), that life is the greatest gift of God and that 'no one is either superior or inferior in humanity'.

The Importance of the Community

In contrast to the more individualistic approaches in the West, Ubuntu ethics emphasizes the role of the community and the relations between the individual. With regard to that aspect, Ubuntu is closer to approaches such as communitarianism and in contrast to more neo-liberal individualistic tendencies in the West.

The community is 'a network of delicate relationships of interdependence' (Hailey 2008). It is a dynamic association of man and woman who have a special commitment to one another and have developed a distinct sense of their communalism (Ramose 2002 in Gumbo 2014).

Communitarian

The wellbeing of individuals is derived from 'communal imperatives' (Petersen 2006). The individual wellbeing is valued within the framework of group aspirations. Hence, 'the reality of communal world takes precedence over the reality of individual life histories' (Mandiva and Chingombe 2013). The emphasis of Ubuntu is 'living well together' (Denealin and Mcgregor in Norren 2014). Connel (2005) sees individual capacity within the collective as 'freedom to be together in a way that enhances everyone's capability to transform themselves in their society' (cited in Norren 2014). Ubuntu is also about collective responsibility that serves as 'a basis upon which social order is constructed' (Mtabela 2015). Communal action is to alleviate sufferings and provide assistance 'with the stronger helping the weaker members of the community' (Munyaka and Motlhabi 2009).

Participation and Inclusiveness

The community is active through participation and inclusiveness; All human beings have relevance in the community. Hence, 'no single human being can be thoroughly and completely useless' (Norren 2014).

Relationship

The community members are interrelated. According to Chibvougodze (2016), 'Ubuntu is concerned with human relations where one's being is tied to another'. The theme of Ubuntu points 'to a strongly constructivist ontology in which a person's sense of being cannot be detached from the social context in which they found

themselves' (Bolden 2014). Ubuntu places emphasis on cooperation rather than competition. The group solidarity is central to the cohesion of the community. Community members form a common front in facing the challenges that threaten their existence (Mandiva and Chingombe 2013).

14.5 Applications of the Ethics to Energy Marginalization in Africa: Comparative Reflections

14.5.1 The Western Individualism

The outcome of the observed marginalization in renewable energy development in Africa is summarised as shown in Table 14.6.

Elaboration and Reflection: Strength and Limits of the Western Framework

Looking at the foundation of Western Individualism and the application to the case of energy marginalization in Africa, one can see the strength and the weaknesses of the central ideas with regard to marginalization. If nature is seen as a mere resource, this explains the anthropocentrism of many approaches in energy justice (Sovacool et al. 2016). If the rational individual is seen as the starting point and the societal force field is seen as contract of rational individuals, this can both explain the strength and the limits of many approaches.

The strength lies in the ideas of justice and individual rights: energy justice in the West has been conceptualized in the context of cosmopolitanism of equal individuals (Sovacool et al. 2016). Justice demands that all individuals around the globe are treated fairly with regard to energy. This means that the benefits must be distributed fairly; the same holds for the burdens. Finally, the procedure must be transparent and fair. Sovacool et al. (2016) have therefore listed availability, affordability, due process and transparency; sustainability, intra- and intergenerational equity; and responsibility and central demands of energy justice (ibid.). All of these aspects can be justified morally in the light of the rights of the individuals to a fair and equal treatment.

Marginalization can then be identified on two levels. The first level lies in the lack of current *institutions* to meet the demands of energy justice; the second level concerns shortcoming of the *framework* itself. Let us look at both in turn.

With regard to the first, marginalization concerns the groups that lack political power. Minorities or the distant (either groups distant in space or distant in time) are negatively affected by the current state of institutions that rely on participation and representation to organize the distribution of resources or access to energy. Minorities and poor people often lack the resources to affect decision making in politics or in economical contexts. We can see this effect from the data in Africa.

Table 14.6 Outcome of renewable energy marginalized in the eye of the European ethics

Concept	Interpretation in renewable energy terms
Nature	*Cartesian dualism: nature as value-free resources* This perspective regards nature as a source of energy and food and neglects possible intrinsic values of nature
	Environmental ethics: intrinsic value of nature The ecological imperative calls for a shift to renewable energy production. As shown above, Africa has the least capacity among the six continents; however, the percentage of renewable energy is growing. Arguably, it is growing too slowly from an ecological perspective
Individual	*The individual as utility maximizer* The first principle of a utility-maximizing perspective would be to lift people out of physical poverty, followed by covering energy poverty. This might explain the slow uptake of renewable energy[a]
	The individual and human rights The right to adequate, reliable and convenient energy has been violated. The rights of future generation towards equal opportunity are endangered by a large-scale unsustainable energy production. However, this burden is arguably caused primarily by rich countries outside Africa with high GG emissions per capita. It is thus a problem of global justice (see next category)
Society	*Society as a contract: justice* The strength of the Western framework lies in the (anthropocentric) conceptualization of energy justice. However (apart from communitarianism), the community is not regarded as a central category Justice and access A large proportion of the people is excluded from access to renewable energy and the benefits of its services. Energy exclusion can explain low livelihood capability and poverty among many members of the African community. This is a problem for justice Representation of marginalized groups Participation and representation of the poor are low Representation of future generations The urgency to fight challenges of current energy poverty puts considerations for future generations second place

[a]As an anonymous reviewer has pointed out, it might constitute a burden rather than a right for the poor people to use more renewable energy with the consideration of the higher cost and inconvenience of renewable energy as opposed to traditional large-scale energy production of unsustainable sources, such as coal

However, it is arguably a global problem. For example, minorities in the USA, such as people of colour or native Americans, are disproportionally affected by environmental hazards or health issues (Sovacool et al. 2016; Allen 2001; Holifield 2012; Ard 2015). Per definition, marginalized people are less capable to have an impact in the distribution mechanisms of the market or the democratic decision-making procedures. Therefore, it is maybe not surprising that they are disproportionally negatively affected. These effects might be disproportionally more dramatic in countries with low GDP, such as on the African continent. It is thus important to strengthen impact of marginalized groups by means of representing their voices in policymaking and by turning away from top-down decision making towards deliberation and fair participation (Sovacool et al. 2016).

The same holds for 'distant' groups, such as the globally distant whose voices are not represented in decision making or the temporarily distant: future generations. Neither of these groups can affect market or policies. Since participation of distant people is either difficult (as in the case of citizens of distant countries) or impossible (as in the case of future generations), their needs and rights must be properly represented in parliament and (western) legislation (Pols and Spahn 2014; Beyleveld et al. 2015). Again, this effect is more prominent in poor countries, as the moral imperative of overcoming existing marginalization and poverty in the present might be seen as more urgent than long-term challenges. The more resources a country has, the more duties it has to address global challenges (Hösle 2004). International energy justice is, for example, increased if the West outsources his environmental challenges to other continents, as discussed in the debate about the ethical challenges of biofuels (to reduce western carbon footprint), produced for export to the West in countries with higher food and energy poverty (Pols and Spahn 2014).

This points to challenges for the framework of contractualism itself (Spahn 2018).

Furthermore, we have duties towards future generations that go beyond what is 'rational' from the perspective of game theory (Gardiner 2001). The relation of energy depletion and pollution between us and future generations remains an unsolvable prisoner's dilemma, unless we accept that our moral duties go beyond the demands of enlightened egoism. This brings us to the fact that in order for the individual to be willing to make the necessary sacrifices for distant people (either in the future or in distant countries), we need to first overcome energy poverty and increase capacity to meet your basic needs. In richer countries, such as the West, we need to develop a mindset that goes beyond care for one's own interest and includes respect for the interests of others. Care suggested to re-evaluate traditional notions of love, community identification and shared-fate motivations that go beyond Western Individualism (Care 2000). This might thus include a re-evaluation of the notions of community and nature, for which we in the West could learn from other cultures—such as Africa—or from prior conceptualizations within our own culture (as in Greek philosophy or in some aspects of Christian religion). The urgency of the problem of energy marginalization should be a call for philosophers to engage in cross-cultural learning with the aim to seek motivational and theoretical resources from a rich reservoir of philosophies that can help conceptualize the moral demands and motivate individuals to make moral choices.

14.5.2   Ubuntu Interpretation

The outcome of the observed marginalisation in renewable energy development in Africa is summarized as shown in Table 14.7. As shown in the table, the basic concepts of the Ubuntu have been violated. The Ubuntu interpretation of energy marginalization in Africa is made in respect of six Ubuntu ethical principles. These are community, resource management, participation, relationship, inclusiveness and human right. In respect of the community, the renewable energy situation in Africa

undermines the community. The community is in energy pain and then its dignity compromised. Both the joint ownership of renewable energy resources and beneficial exploitation have been ignored.

The participation of the people in renewable energy development cannot be seen in the current renewable energy situation in Africa. The community members have not invested enough in terms of real engagement, financing, organization and partnership in making renewable energy available to household, institutions and the economic enterprises. There is a clear loss of positive relationship between renewable energy resources and the people on one hand and among people and relevant energy institutions on the other hand. The sense of harmony embedded in Ubuntu is lacking in the renewable energy development process. In terms of inclusiveness, a large proportion of the people is excluded from access to renewable energy and the benefits of its services. The spillover effect is deprivation in productive activities for which energy is required and low livelihood capability and poverty among many members of the African community. Similarly, the right to adequate, reliable and convenient energy has been violated. The implication of all these is that the basic principles of Ubuntu are evidently violated in renewable energy development in Africa.

In spite of all these violations of the true spirit and intent of Ubuntu and its criticisms, the ethical philosophy clearly has relevance in the quest for better service delivery in general and renewable energy development in particular. When a part of the community is underserved with basic services, the spirit of Ubuntu should be

Table 14.7 Observed marginalization in relation to Ubuntu concepts

Concept	Interpretation in renewable energy terms
Community	There is a clear evidence of violation of the values of community and communality in renewable energy development in Africa. A large segment of the community is in energy pain. Dignity of the members of the community is already undermined, and the energy welfare is grossly absent. A visibly unfair situation exists, and so, energy justice is threatened
Resource ownership	There is a gap between the renewable energy resources of the community of Africa and the taking of its possession in terms of active and beneficial exploitation and development for the welfare of the people. Energy as a property of the community has been ignored
Participation	Both marginalization and its cause can be associated with lack of participation. Community members have not invested enough in terms of real engagement, financing, organization and partnership in making renewable energy available
Relationship	The relationship is loose. The sense of accountability to the spirit that encourages positive action is absent in this case. By failing to mobilize renewable energy resources, nature is also neglected. There is lack of harmony that should engender positive action for energy development
Inclusiveness	A large proportion of the people is excluded from access to renewable energy and the benefits of its services. Exclusion leads to further deprivation as productive activities for which energy is required are affected. Energy exclusion can explain low livelihood capability and poverty among many members of the African community. It is also seen in the large disparity in access to energy between rural and urban areas
Human right	The right to adequate, reliable and convenient energy has been violated

invoked to create a better deal for all, to make the delivery institutions responsive and to make the distribution of responsibility and benefits even from and to all. To overcome these obvious deviations from the principles of Ubuntu, we recall the earlier suggestions by (2017b):

- Ensuring fair treatment for land owners when land is appropriated for energy development
- Adopting a decentralised renewable energy development that can ensure close link between communities and energy supply sources and to guarantee a fair internalization of energy benefits
- Adopting participatory system that ensures partnership, sharing of risk and sharing of benefits
- Providing energy leadership that ensures efficient renewable energy development and community trust to participate
- Ensuring intra-continental cooperation that effectively employs the true spirit of 'I am because we are; we are because I am'
- Adopting the concept of community energy where community energy-based resources are used by the people for energy development
- Developing effective energy citizenship that attracts commitment of community members, respects energy resources, honours energy obligations and obeys the rules of energy development

14.6 Conclusion and Future Research Questions: What the Two Perspectives Can Learn from Each Other

We have analysed energy marginalization from two disciplines (philosophy and urban planning) and from two perspectives: one focusing on relevant concepts in the West and the other one starting from the African Ubuntu framework. It is difficult to render justice to such a complex comparison in a short essay. Our attempt is a first step in the direction of a comparative approach of Western and African perspectives.

We have noted that the West emphasizes the rights and roles of the individual and tends to regard energy ethics a question of justice. This is an important perspective; however, the West might learn from other cultures, such as the African Ubuntu ethics to re-evaluate the importance of nature and of community alike.

There are both overlaps and differences between the western and the Ubuntu perspectives. The most striking difference lies in the relative importance of the community in Ubuntu framework which is community-focused. It emphasizes communal life. Here, the rights, dignity, obligations and entitlements of the individuals depend on the community. The joy and pain of the individuals are community-based. It emphasizes cooperation rather competition and communality rather than individuality. The chapter by Peligrini et al. in this volume goes into detail by investigating the different notions of 'justice'—a western individualistic framework as opposed to a more communitarian perspective. We see overlap in the emphasis of ethics in the West and Africa for the needs of people: it is a moral imperative to overcome

energy poverty and to allow equal access to opportunity, both for currently living people and with regard to future people. Another striking difference might lie in a different view on 'nature' within Africa and the West, even though this difference relates more to an underlying cultural interpretation of the role of nature and is difficult to pinpoint it down to very specific, empirically observable differences in the concrete field of implementation and development of renewable energy production. However, we would argue that the 'nature as resource' view, which is quite common in the West, needs to be overcome since one can argue that it rests on a problematic metaphysics of nature and since it may stand in the way of further developing an environmental ethics that goes beyond anthropocentric conceptions. Another striking difference is in the realm of formality of the two frameworks. The individuality philosophy has been allowed to permeate the practical life of the people; it has been made to be reflected in the institutions of the state and in the conduct of the people. This cannot be said of the Ubuntu philosophy. Its influence on institutions is limited, while its application among people is only informal. While progress is achieved at both formal and informal levels, the difficulty of enforcement of basic rules under informal arrangement in the modern times undermines the utility of the Ubuntu framework.

Taking these findings into account, we suggest the following questions for further research in comparative philosophy.

We would like to argue that two strands of comparative work are needed in the future. The first one concerns the level of conceptual analysis and is mainly a task for philosophy and the humanities: What are the similarities and differences between Western and African frameworks? How do e.g. religions in the West conceptualize notions of individuality, nature and community and how does this relate to African interpretations of these same notions? Where do we find common emphasis and where do we find striking differences?

The second strand of research question requires the work of empirical social scientists: If we are able to identify differences in philosophical and ethical conceptualizations, how do these in turn affect energy politics in the real world? How much of the decision making is currently influenced by widely held beliefs about what the value of nature is, what the core of human existence entails and how communities are understood? This comparative work is a broad field of research; our joint essay could only offer a modest first step towards a comparative philosophy of energy justice.

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