Environment for Development

THE POLITICAL ECONOMY OF COAL

OBSTACLES TO CLEAN ENERGY TRANSITIONS

Edited by
Michael Jakob and Jan C. Steckel

ROUTLEDGE

The Political Economy of Coal

This volume provides an overview of the political economy of coal in diverse country contexts.

Coal is the largest source of greenhouse gas emissions globally, accounting for about 40 percent of energy-related CO_2 emissions. Continued construction of coal-fired power plants could make the climate targets of the Paris Agreement infeasible to achieve. In spite of sharply declining costs for renewable energy sources, many countries still heavily rely on coal to meet their energy demand. The predominance of coal can only be adequately understood in light of the political factors that determine energy policy formulation. To this end, this edited volume assembles a wide variety of case studies exploring the political economy of coal for across the globe. These includes industrial and developing nations, coal importers and exporters as well as countries that are either substantial coal users, are just beginning to ramp up their capacities, or have already initiated a coal phase-out. Importantly, all case studies are structured along a unifying framework that focuses on the central actors driving energy policy formulation, their main objectives as well as the context that determines to what extent they can influence policy making. This large set of comparable studies will permit drawing conclusions regarding key similarities as well as differences driving coal use in different countries.

This book will be of great interest to students and scholars of energy, climate change, resource management, and sustainable development. It will also appeal to practitioners and policymakers involved in sustainable development.

Michael Jakob is a senior fellow at the Ecologic Institute and a fellow at the Mercator Research Institute on Global Commons and Climate Change, Germany.

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Environment for Development
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Preface

Coal has been on top of our research agenda for more than a decade now. As it constitutes the most important source of global greenhouse gas emissions, phasing out coal is a prerequisite for achieving ambitious climate targets. At the same time, most coal is burnt to generate electricity, for which increasingly affordable substitutes exist in the form of renewable energy sources. These clean energies not only mitigate climate change, but also yield substantial co-benefits, such as reduced air pollution when replacing coal. Hence, a transition from coal to renewables seems like an obvious starting point for climate policy, a fact that is frequently emphasized by modeling efforts and the IPCC.

The question of why coal plays such an important role in energy production was closely linked to our investigation of the relationship between economic development and energy use patterns, which we both undertook as part of our Ph.D.s at the Potsdam Institute for Climate Impact Research (PIK). Much of this research has been driven by our desire to identify ways how poor countries can achieve progress in the fight against hunger and poverty without repeating the carbon-intensive development patterns of industrialized countries. From this perspective, widely available and relatively cheap coal seemed like an obvious choice for countries for which short-term economic development objectives are more pressing than long-term climate goals.

With rapidly declining costs of renewable energy technologies, we realized that pure economic explanations cannot fully explain countries' energy policies, and in particular their stance toward coal. We fully agreed, and still do, to the prescription of economics that markets should be designed in a way that ensures that emissions from fossil fuel use reflect the associated social costs, for instance by means of carbon pricing. Yet, we were also aware that this prescription misses a crucial point: how should such measures be implemented if policymakers think that they delay industrialization, have adverse consequences for energy security, and might result in concentrated job losses in vulnerable regions? How can the political resistance of powerful interest groups, such as utilities, owners of coal mines, energy-intensive industries, and trade unions, who might bear the brunt of the costs of an energy transition, be overcome?

This is how we got involved in the study of political economy. Being new to this field, we had to spend quite some effort to catch up to a vast field to which a plethora of authors have made seminal contributions over many decades. The approach we intended to take was first and foremost applied, resulting in analyses that are accessible to a broad readership without requiring extensive training in political science. Hence, we decided – in collaboration with Christian Flachsland from the Hertie School of Governance and Johannes Urpelainen from Johns Hopkins School of Advanced International Studies – to develop an analytical framework, which allows a straightforward identification of key elements of the political economy of coal. This approach aims at spelling out the objectives of key actors and how they can influence policy making. The resulting AOC (actors, objectives, context) framework constitutes the basis for all 15 case studies assembled in this book.

Breathing life into this abstract concept requires applying it to specific real-world cases. For this reason, we traveled to different countries and – following the framework – interviewed key stakeholders about their perception of recent developments in coal politics. Our first two case studies brought us to Vietnam and Indonesia. Both studies, which are reprinted in this volume in modified versions, raised our awareness for the importance of vested interests and the crucial role of state-owned enterprises in the power sector.

We soon realized that it would be worthwhile to have a broad range of studies of this kind to eventually be able to carry out cross-country comparisons, very much in the spirit of the case studies undertaken by Elinor Ostrom and coworkers regarding governance system for commons. We also realized that we – even with the great support from our colleagues at the Mercator Research Institute for Global Commons and Climate Change (MCC), who were engaged in further studies on Colombia, India, Kenya, and the Philippines (all included in this volume) – would not be able to produce the amount of studies needed to get a comprehensive picture of the political economy of coal in different contexts.

This was the start of this project. To make sure that studies in the end will be comparable, we invited interested authors to Berlin with whom we first conducted a workshop on the theoretical framework. We established regular meetings with all authors over the course of three years, tracking progress and providing room for detailed feedback and discussions. Hence, a small community has emerged, which finally delivered the excellent studies compiled in this book. The team of authors includes highly renowned specialists in their fields with often many years of experience with the country under study. We are grateful for all the time and effort each of them dedicated to this book. All authors gained or completed their insights through stakeholder interviews, for instance with representatives of key ministries, political parties, civil society, industry, and academia. The 15 case studies included in this integrated volume stem from a large variety of countries differing, inter alia, in their levels of economic development, political systems, endowments with fossil fuel reserves and potentials to generate renewable power. In this manner, we were able to produce a substantial amount of empirical evidence for the factors that promote or slow down coal use.

We have deliberately chosen a mainly descriptive approach that clearly highlights the underlying political economy mechanisms that determine the formulation, implementation, and enforcement of energy and climate policies. That is, readers should not expect comprehensive proposals on how to phase out coal in the countries under study. Yet, by shedding light on the driving forces behind coal use, each analysis is highly policy relevant by providing a solid understanding of the complex interplay of different actors and their interests. We firmly believe that this understanding must be the foundation of developing further solutions, not only to phase out coal, but to enable effective climate policy. We thus hope that this book is not the end, but rather the beginning, of a journey toward an ever-expanding understanding of the political economy of coal and more generally climate policy – and thus will eventually result in policies that ensure that international climate targets can be met. For this reason, all interested researchers are invited to produce their own country case studies or build on the studies in this volume to develop policy recommendations.

Acknowledgments

This book has been a journey that started sometime in 2017. It is time to thank all of those who helped to pave the way from first vague ideas how to conceptualize and analyze the political economy of coal to a book that now comprises 15 integrated cases study chapters.

We would like to thank our colleagues at the Mercator Research Institute on Global Commons and Climate Change for commenting on first ideas and earlier drafts, including Ottmar Edenhofer, Christian Flachsland, William Lamb, and Jan Minx. We would also like to thank Susann Reinsch, Annelie-Saskia Wal, Franziska Faber, and Elisabeth Nierhoff who supported us in managing this project administratively. We would like to express our gratitude to Antonella Bosio and Lina María Puerto-Chaves for outstanding research assistance and support with editing the book, and Lorenzo Montrone and Niccolò Manych for helping with figures and maps in the introduction.

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1 Introduction

The political economy of coal[1]

Michael Jakob and Jan C. Steckel

Why political economy matters

The goal of reducing greenhouse gas emissions has been recognized on the international level, for instance within the Paris Agreement of the United Nations Framework Convention on Climate Change (UNFCCC, 2015). The large majority of countries have stated their intention to contribute to this target in the form of voluntary "Nationally Determined Contributions" (NDCs) as well as national climate change strategies and plans.

Nevertheless, in many countries, we still observe substantial new investments in fossil fuel–based energy infrastructure, in particular coal-fired power plants. This development not only contradicts climate change mitigation targets but also carries substantial social costs, for example, related to public health issues arising from local air pollution. Taking these costs appropriately into account would make a transition to clean energy sources worthwhile for most countries even from a purely national short-term perspective (Rauner et al., 2020).

Policy makers frequently fail to adopt such "no-regret" options because political decisions on energy and climate policy are not exclusively driven by considerations to improve overall well-being but are also heavily influenced by special interests. These include, inter alia, public demand for low energy prices, lobbying from powerful interest groups, or the desire to create jobs and accelerate structural change. The extent to which such political issues hinder the transition toward a clean energy system crucially depends on the specific context, for example, a country's endowment with fossil fuels, its potential for alternative energy sources, its industrial structure and public attitudes toward climate change.

Continued investments in coal-fired power plants would lock in emissions and impede the implementation of climate measures in the future, as this infrastructure has a lifetime of several decades. For instance, if all coal-fired power plants that are currently announced, planned or under construction were actually built, the 2°C-target would likely be out of reach (Edenhofer et al., 2018; Tong et al., 2019). In order to devise strategies that prevent such developments and instead highlight possible entry points for ambitious climate policies, it is useful to gain a better understanding of why individual countries currently

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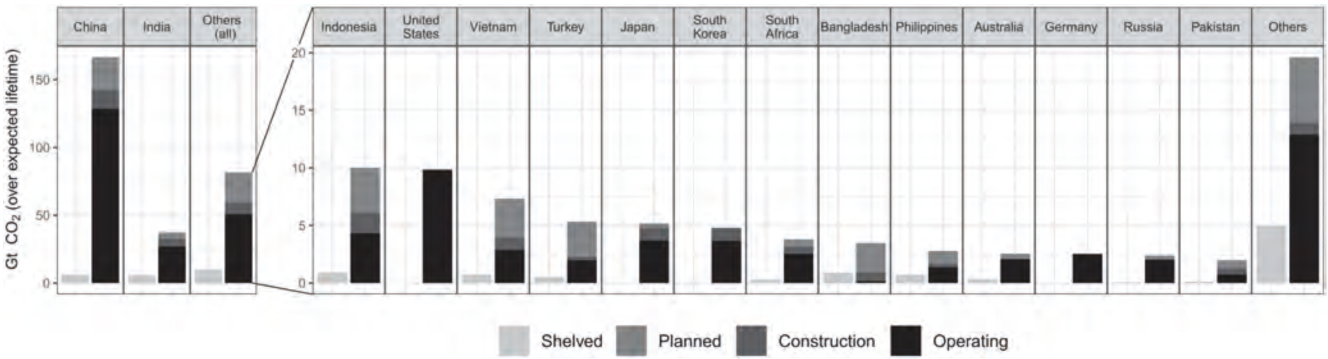

Figure 1.1 Emissions that can be expected from coal capacity (existing, under construction and planned) as of January 2021 for top 15 countries.

Note: Calculations of committed emissions are based on average historical values.

Source: Global Energy Monitor (2021).

build up carbon-intensive energy systems. Despite obvious benefits of climate change mitigation policies for the public good, particular interest groups might lose from more ambitious climate policy. They might even have the power to veto any reform that would change the status quo. In order to identify politically viable entry points into ambitious climate policy, one needs to understand the underlying political economy, that is, how the economic structure, the political institutions and the political environment shape policy outcomes.

Yet, the literature (see the "Different approaches to understanding political economy" section) usually looks into country-specific details of the political economy. In this book, we aim to disentangle the underlying factors of the political economy of coal. We present 15 different country studies that all follow the "Actors, Objectives, Context" (AOC) framework (Jakob et al., 2020, see the "The AOC framework" section), allowing to compare countries and draw some cross-country conclusions. The countries under consideration show broad variation in, for example, their levels of economic development, political systems, technological capacities and endowments with fossil as well as renewable energy sources. The countries included in these studies together cover more than 80% of the current global coal-fired capacity and coal-fired power plants that are under construction or planned, and about 85% of global coal production (cf. Figure 1.1).

We group countries into four characteristic country clusters as shown in Figure 1.2: (i) countries where coal use is already declining or that have adopted plans to phase out coal, (ii) established coal users with a long-standing history of coal-fired power generation, (iii) countries that are on the verge of adding substantial new coal capacities and (iv) countries that are important coal exporters. These groups are neither exclusive nor homogenous. For instance, some coal-exporting countries also consume substantial amount of coal (such as Australia), whereas others mostly target the export market (such as Colombia). Moreover, countries may aim to phase out mainly because of either climate concerns (such as Germany, or the United Kingdom) or as a result of market forces (such as Chile or the United States). Nevertheless, they exhibit important similarities that help to structure our analysis.

All studies were undertaken by authors who are experts in their fields and possess substantial knowledge on country-specific circumstances. Evidence was derived by semi-structured interviews as well as thorough analysis of publicly available documents (such as laws, regulations and government reports). To ensure that all case studies meet scientific standards, they have undergone a strict peer-review process. Intermediate project results have been discussed on multiple workshops in 2019, 2020 and 2021.

For each country, the respective authors systematically address the following questions: Which objectives are behind specific actors' decisions to invest in coal? What have been reasons to phase it out or phase it in, respectively? Which narratives are used by coal incumbents? What is the role of vested interests versus economic factors?

Figure 1.2 Countries covered in this book sorted by country groups.

Note: Phase-out countries (Chile, the United States, the United Kingdom, Germany and Bulgaria) and established users (China, India and Turkey); phase-in countries (Kenya, the Philippines and Vietnam) and export-oriented countries (Australia, Indonesia, South Africa and Colombia).

Comparing the single case studies – interesting in their own right – allows for identifying specific patterns and stylized facts that are valid across various jurisdictions. Understanding those patters will help to identify entry points for policies that can effectively phase out coal. By systematically analyzing the political economy of coal across countries, this volume contributes to a better understanding of political influence and the mechanics of vested interests that go beyond coal and climate policy. The final chapter of this volume draws together insights from the individual case studies and discusses which roles specific actors, objectives and context factors play for the political economy of coal for each country group. These insights help to identify crucial entry points for coal phase-out policies that take into account country-specific circumstances.

Different approaches to understanding political economy

The study of the political economy of policy formulation, implementation and enforcement is firmly established in a range of policy fields, including, for example, trade (Grossman & Helpman, 2001) and environmental policy (Aklin & Urpelainen, 2013; Keohane et al., 1998; Oates & Portney, 2003). Public policy scholars have advanced and empirically tested a range of theories of the policy process (Majone, 1975; P.A. Sabatier & Weible, 2014). These emphasize different factors, including the role of the construction of interests and policy learning of key actor groups (P. Sabatier & Weible, 2007), policy entrepreneurs (Kingdon, 1995) and institutional contexts (Ostrom, 2005). Gilens and Page (2014) point out the differing power of voter and interest groups in affecting policy outcomes, with economic elites and organized business interest groups having higher influence than median income voters in the US context.

Research on the political economy of climate and energy policy often builds on insights from literature on the political economy of environmental policy developed in earlier decades. Oye and Maxwell (1994), for example, distinguished between "Stiglerian" settings, in which the beneficiaries of an environmental policy are well-organized and costs widely dispersed (thus making policy adoption more likely), and "Olsonian" settings, in which costs of regulation are concentrated but benefits are dispersed (making policy adoption more difficult due to free-riding problems in interest group formation). These considerations have also sparked a substantial amount of work examining how special interests lobby to achieve favorable regulation, for example, by providing contributions for electoral campaigns (Kim et al., 2016).

Previous studies on the political economy of climate and energy policy focused on explaining fossil energy system lock-in (Helm, 2010; Moe, 2010; Unruh, 2000) and on the challenge of transitioning toward a low-carbon energy system (Geels, 2014; Hochstetler, 2020). These studies identified a combination of powerful rent-seeking incumbent interest groups, technological infrastructures favoring fossil fuel use (such as grids built around large-scale coal and gas power production) and regulatory regimes stabilizing this configuration. Various studies have examined potential mechanisms by which transition toward more sustainable energy systems might be politically feasible, including notions of niche development of renewable technologies (Geels et al., 2017), polycentric governance approaches emphasizing decentralized efforts at sustainability transition (Ostrom, 2010; Urpelainen, 2013) and the role of building "green" constituencies that would counteract the interest of incumbent veto players (Aklin & Urpelainen, 2018). Concerning the latter, Meckling et al. (2015) argue that it is essential to build up renewable energy technology interest groups first, to enable more ambitious climate policy formation in later stages. Pahle et al. (2017) advance this line of research on climate policy sequencing by suggesting a typology of barriers to climate policy stringency and options to relax these over time. Hughes and Urpelainen (2015) develop a political economy model that emphasizes public opinion and special interests as drivers of economy-wide and sectoral policies.

In addition to research examining the strategic interplay of actors with diverse objectives in specific institutional and technological settings, a more recent line of research is systematically investigating a broader range of structural political economy factors by applying econometric techniques on large cross-country samples (Sam Fankhauser et al., 2015; Samuel Fankhauser et al., 2016; Lachapelle & Paterson, 2013; Tjernström & Tietenberg, 2008). Other studies explore support for different kinds of climate policy instruments (Rhodes et al., 2017), including the factors determining the adoption and level of domestic carbon pricing in-depth (Dolphin et al., 2016; Levi et al., 2020; Rafaty, 2018) or focus on carbon market design (Ervine, 2017; Jenkins, 2014) and revenue recycling (Carl & Fedor, 2016; Klenert et al., 2018).

Another recent line of research, which is closely related, synthesizes theoretical and empirical insights on the political economy of climate and energy policy. Biber et al. (2016) review the literature and discuss a long list of political economy factors influencing energy and climate policy. In a similar vein, Karapin (2016) identifies a range of structural and process factors in the literature and applies these in a comprehensive comparative case study on California, New York and the US federal level. However, neither proposes a generalized framework suited for organizing political economy analysis of climate and energy policy, which is the aim of this chapter. Finally, a meta-theoretical framework to analyze the interplay between techno-economic, socio-technical and political factors in energy system transitions is provided by Cherp et al. (2018).

The AOC framework

The AOC framework provides a flexible, generally applicable framework for comparative case analysis that simultaneously considers actors, objectives and context as potential drivers of policy outcomes. It follows the approach for building analytical frameworks outlined by Ostrom (2007) to allow for a flexible combination of different theories that consider individual subsystems and more specific causal effects that are relevant for the understanding of political processes. This framework could in principle be applied to describe a broad range of political economy issues and incorporate a range of disciplinary approaches, including political science, social choice and neoclassical welfare economics. Due to its focus on structural variables and the interplay between different actors, it is particularly well suited for the analysis of energy and climate policy. It adopts the perspective that energy and climate policies emerge from a complex interplay of a diverse set of actors, such as influential individuals, key ministries, industry groups, unions or voters, that all have different objectives as well as different means for influencing policy-making. It builds on the central assumption that policies reflect the objectives of those actors that have the greatest influence in the decision-making process. This general structure is especially valuable to conduct comparative case study work.

The framework to analyze the political economy of energy and climate policy builds on three central elements, (i) the relevant *actors*, (ii) their *objectives* and (iii) the *context* determining how a certain objective matters for each actor and how these actors can influence policy formulation.

Actors, objectives and context

First, the AOC framework aims at identifying the most important *actors* that influence the formulation of climate and energy policies. We divide this category into *societal actors* and *political actors*. Societal actors include unions, industry associations, civil society organizations and voters as well as international organizations and bi- and multilateral development banks. Political actors include, among others, political parties, the parliament, key ministries, regulatory agencies and the president. While the behavior of political and societal actors is embedded within a set of formal and informal institutions constituting a society's polity, we suggest a strong focus on actors as a core unit of analysis because these are the driving forces of policy change or continuity. Choosing actors as a key unit of analysis is also helpful to facilitate empirical access to the field (e.g. via interviews, stakeholder analysis), and to consider strategies available to different actor groups in policy advice.

Second, the AOC framework entails establishing a list of *objectives* which matter for these actors. This perspective acknowledges that energy and climate policies are usually implemented with multiple policy objectives in mind (Edenhofer & Kowarsch, 2015; Jakob & Steckel, 2016), and that objectives and their prioritization differ across groups (Joas et al., 2016). The scientific literature has identified numerous trade-offs and synergies of energy and climate policies with other policy objectives, including economic costs and their distribution, industrial development, job creation, energy security considerations and ambient air quality. Hence, we assume that in general, each actor's stance toward energy and climate policy may depend on their relative weighting of several (but not necessarily all) of these policy objectives. For instance, environmental civil society organizations may be most concerned about environmental issues, unions about employment and wages and the private sector about profits. Yet, each of these groups may also care about other aspects more directly concerning other groups, such as distributional implications. We assume that for societal actors, these objectives matter directly (societal objectives) and that political actors are concerned about the interests of the societal actors they represent but may also have additional idiosyncratic objectives, such as being reelected or increasing their standing or power (political objectives). As an example, the ministry of the economy might be most responsive to the demands of key industries, while the ministry of the environment might be more amenable to lobbying by environmental NGOs. Which policies eventually are implemented will be determined by the complex interplay of the interests of these political actors mediated by political process dynamics. For the analysis, it is helpful to distinguish between objectives that are directly affected by energy and climate policy, such as low energy prices or security of supply, and those that relate in a more indirect fashion, such as employment and structural economic change.

Third, the AOC framework examines the general *context* in which policymaking takes place. In our formulation, context is a broad category, including economic, environmental, institutional and discursive aspects. Economic factors include, for example, the level of development, the economic structure (e.g. share of energy-intensive industries) or the energy resource endowments (e.g. fossil or renewable energy resource-base) of a country. Formal and informal domestic institutions structure both how societal groups interact with policy actors, and how formal policy decisions are being taken (e.g. electoral system, constraints on lobbying) and implemented. Beyond domestic institutions, the international embeddedness of a country may also matter for domestic climate and energy policy formation in varying forms and degrees (e.g. Paris

Agreement, access to international financial markets). Discursive factors include public opinion (e.g. the share of the population believing in global anthropogenic climate change, political polarization, or the level of government support) or the governance and behavior of media actors. Environmental factors include affectedness of a country or more specific regions by local (e.g. air pollution) and global (e.g. climate change) environmental problems.

Context matters in four ways. First, it specifies how specific policy objectives matter for individual societal actors (Oye & Maxwell, 1994). For example, the way in which profits matter for utilities likely depends on whether electricity generation is mainly carried out by private or state-owned companies (i.e. organization of the power sector). Second, context determines the form and degree in which societal actors have an influence on political actors (Gilens & Page, 2014). For example, the extent to which organized lobby groups can influence policy decisions can be expected to depend on the formal and informal forms of interest group representation, the prevailing level of corruption, political ideologies and trust in government. Third, context matters for how political objectives matter for individual political actors (Alesina, 2013). For instance, decision makers might be able to place higher importance on their personal influence in authoritarian regimes compared to more democratic settings. Fourth, context structures the form and degree of how these political actors can influence policy-making, implementation and enforcement (Cremer et al., 2008). For example, parliament chambers and ministries likely have different powers in presidential and parliamentary systems, and the power of political parties can be expected to differ between proportional and majoritarian electoral systems.

In applying the AOC framework, carefully characterizing the dynamic relationships and power structures determining political actors' objectives is important. These are shaped, first, by the objectives of societal actors that can influence political actors inhabiting formal positions of power in various ways (e.g. campaign financing, voting behavior). Second, distinct objectives of political actors such as ministries aiming at increasing their political power need to be accounted for as well. These also interact with the objective functions of other political actors (such as the president) via bargaining and power struggles in the policy process.

The AOC framework is based on the idea that decision makers can choose from a given set of policy packages. We presume that those policies will be implemented that best meet the objectives of those actors that have the most pronounced influence on policy formulation, implementation and enforcement, either directly in their role as political actors or indirectly, in the role of societal actors that can influence political actors. National as well as international context variables shape both the formation of objectives of actor groups, as well as the broader economic, institutional and discursive context in which they aim to advance them. In this sense, the AOC framework is based on the view that policies are supplied by decision makers to fulfill a demand by certain interest groups.

It does not presuppose a particular mechanism of how actors' interests are aggregated into policy outcomes in the policy process, as these will vary by context and are to be determined in empirical-descriptive studies. Due to its general structure, the AOC framework can accommodate a large variety of empirical settings and theoretical perspectives. These range from developing to developed countries, and from well-governed cases that achieve outcomes which in the welfare economic perspective can be considered to be close to the social optimum, to clientilistic regimes and interest group–based explanations of public policy in which policies are adopted to serve a narrow political and economic elite. The AOC framework does not assume rational policy design in the sense of an optimization procedure. It is applicable both in contexts where policies are implemented to predominantly serve the interests of those actors that have disproportional influence on policy-making, or in settings where the interests of majority (and minority) voter groups are shaping policy adoption.

Table 1.1 provides some examples of potential societal and political actors, as well as potential environmental, socioeconomic and strategic objectives relevant for climate and energy policy formulation. It also displays a number of factors that might matter for the techno-economic, institutional, discursive and environmental context. This list is far from being comprehensive. Instead, each individual country and policy package will require carefully examining which actors, objectives and context factors are relevant in a particular case.

Table 1.1 Examples of actors, objectives and context factors relevant for the political economy of climate and energy policy

Societal objectives	*Societal actors*
Environmental	Voter groups
Climate change mitigation	Unions
Local air quality	Energy-intensive industries
	Utilities
Socioeconomic	Resource owners
Economic costs and efficiency	Financial institutions
Employment and wages	Industry associations
Diversifying the economy, structural change	Researchers, academia
Poverty alleviation	Multi-national corporations, investors
Social inclusion	Civil society (e.g. NGOs, religious groups, local citizens)
Health	International NGOs
Distribution	
Public revenues and investments	
Profits	
Strategic	
Technology transfer	
Energy security, energy sovereignty	

(*continued*)

Table 1.1 Cont.

Political objectives	**Political actors**
Reelection Increasing influence and political power International standing	Influential individuals (e.g. president) Key ministries and agencies (across different governance levels) Political parties (e.g. via parliament) Regulators, implementing agencies
Context	
Techno-economic Economic situation (GDP, business cycle, fiscal deficit, population density, inequality,…) Fossil fuel endowments, dependence on fossil imports/exports (Global) market developments for fossil fuels and renewable technologies RE potential Grid infrastructure and existing generation capacities Industrial structure (e.g. share of manufacturing and energy-intensive industries)	
Institutional Organization of the power sector Representation of interest groups Political and judicial system (e.g. democracy, parliamentary vs. presidential, electoral system) Government capacity International agreements (climate, trade, investment, technology)	
Discursive Political events (champions for green policies, media attention, framing, socio-environmental conflicts, COP or similar event in country under consideration) Ideational factors (climate change knowledge, right-left polarization, international diffusion of ideas) Trust in government	
Environmental Vulnerability to climate change Focusing events (climate-related impacts, Smog episodes, power cuts)	

Combining the elements of the AOC framework

The interactions between actors, objectives and context are depicted in Figure 1.3. Let there be a number of *a* relevant *policy objectives* that matter for *societal and political actors*, denoted by O_1^S to O_a^S and O_1^P to O_b^P, respectively. The *context factors* are labeled C_1 to C_c. The weights α_{ik} state the importance of policy objective *k* for societal actor *i*. In a similar vein, we regard each political actor to have two sets of objectives: first, idiosyncratic objectives, such as ensuring reelection or increasing influence, where the weight political actor *i* puts on objective *k* is given by β_{ik}. Second, we regard societal actors as influencing political actors, such that the importance societal actor *k* has for political actor *i* is

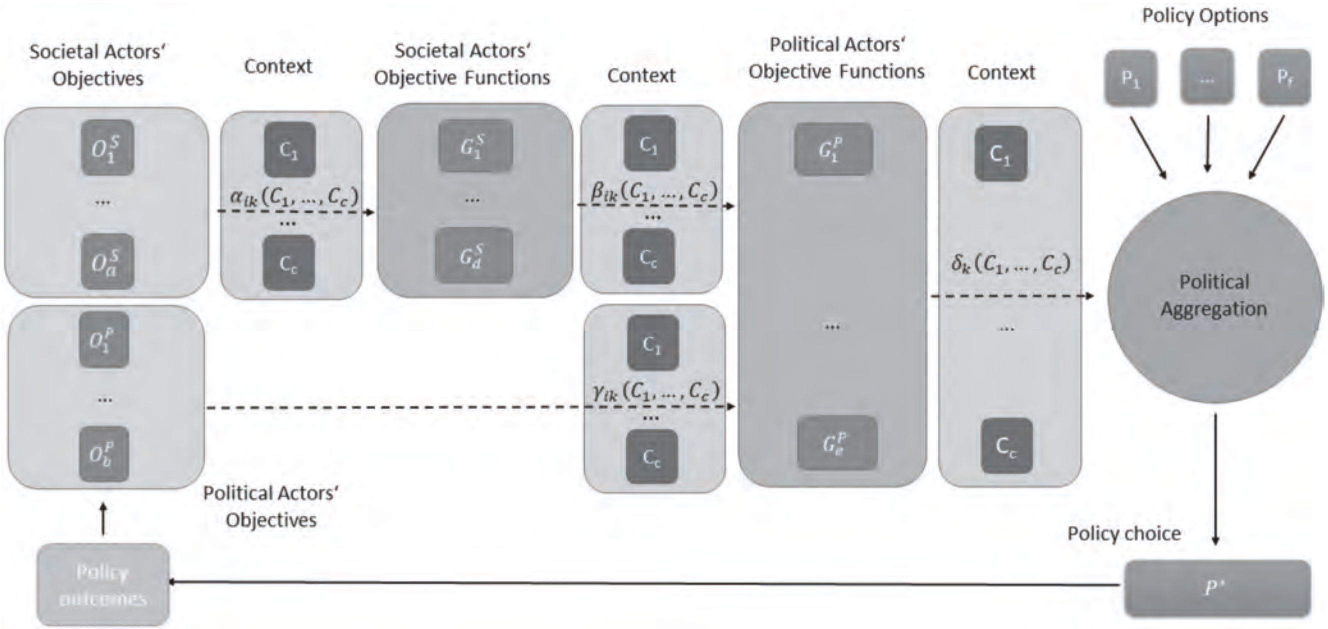

Figure 1.3 Graphical representation of the AOC framework.

Table 1.2 Key elements of the AOC framework

Framework element	*Notation*
Societal actors' objectives	$O^S{}_1 \dots O^S{}_a$
Political actors' objectives	$O^P{}_1 \dots O^P{}_a$
Context factors	$C_1 \dots C_c$
Importance of objective *k* for societal actors *i*	α_{ik}
Influence of societal actor *i* on political actor *k*	β_{ik}
Weight of political objectives for political actors	γ_{ik}
Power of political actor *k*	δ_k
Policy packages	$P_1 \dots P_e$

given by weight γ_{ik} (if an objective or societal actor is not relevant for a certain political actor, the respective weight is zero). Finally, let us denote the degree to which political actor *k*, via the policy process, influences policy outcomes, implementation and enforcement by δ_k. We assume that all weights α_{ik}, β_{ik}, γ_{ik} and δ_k are determined by the context factors C_1 to C_c.

We denote the set of *f* possible policies (in the sense of policy packages that combine different instruments, such as taxes, subsidies, performance standards, transfer payments) that can be implemented by P_1 to P_f. Each policy will result in a specific outcome vector, over time, for each of the objectives of societal and political actors, i.e. O^S and O^P. Then, the *policy package* that yields the maximum political support at a given point in time will be chosen, implemented and enforced because it best meets the objectives of those actors that have the most influence on policy formulation.

The key aspects of this approach are summarized in Table 1.2. This approach can be regarded as an analogy to the comparative static approach in economic theory that describes how an equilibrium between supply and demand (in our case for policies) arises and allows an assessment of how this equilibrium would dynamically change as a result of changes in certain parameters of the system.

This approach can also be conceptualized to study the dynamic aspects of policy change and inertia due to resistance of powerful interest groups to change, creating path dependence and lock-in of fossil infrastructures. This can be achieved by including future outcomes in the list of societal and political actors' objectives in conjunction with how they form expectations on future developments. For instance, certain actors might strive for short-term objectives (such as influencing public opinion or changing the institutional environment), which do not directly meet their immediate priority objectives (such as profits or political power), but facilitate their achievement in the future.

Structure and purpose of this book

This integrated volume assembles 15 country case studies analyzing the political economy of coal. It is divided into four main parts, each of which includes case studies for a particular country category.

Part I discusses the political economy of coal in countries phasing out coal. Hermwille and Kyar explain how concerns about jobs, local economic activity and discontent in vulnerable regions as well as political power of trade unions have contributed to the late date and high public costs of **Germany**'s coal phase-out. Pavlov illustrates that in **Bulgaria** alignment with EU policies constitutes one of the most important policy objectives. For this reason, the government is prepared to implicitly accept a coal phase-out that can be expected to result from EU climate policies, in particular rising carbon prices in the EU Emission Trading Scheme. As shown by DeStephano et al., in **Chile** climate change mitigation is seen important to advance international climate policy and local environmental movements have mobilized against coal. Nevertheless, affordable and secure electricity supply constitutes the government's prime objectives. Due to the country's substantial potential to produce low-cost renewable electricity, these objectives are well-aligned with climate change mitigation, making a coal-phase politically feasible. Walk et al. demonstrate how past efforts to reduce the power of unions have reduced employment in coal mining, and hence political support for coal use in the **United Kingdom**. The liberal power market, in which cost-efficient power generation is prioritized and renewable energy sources are supported by a carbon price signal, has led to rapid declines in coal use in recent years. Liu and Nemet provide a description of how in a liberalized power market increasingly cost-competitive renewable energy sources as well as natural gas are driving out coal in the **United States** despite the lobbying of vested coal interests.

Part II includes case studies on established coal users that struggle to phase out coal and even continue to invest in new capacities. For **China**, Han-Springer et al. point out how the political pressure for regional governments to fulfill economic growth targets incentivizes overinvestment in coal-fired power generation. These excess capacities are not only harmful from a climate perspective, but also economically wasteful. Montrone et al. highlight that in **India**, phasing out coal would entail substantial economic as well as health benefits. However, concerns about job losses concentrated in economically disadvantaged regions, revenue losses from coal transport by the Indian Railway, as well as the prospect of bad loans granted to coal-fired power plants jeopardizing the stability of the financial system make policy makers hesitant to curb coal use. Ayaz and Wiseman demonstrate how in **Turkey** energy policy-making is first and foremost conducted under the perspective of maintaining political control and the legitimacy of current regime. Thus, in exchange for political support, the government actively promotes coal mining and uses by means of financial incentives as well as provision of crucial infrastructure.

Part III features studies dealing with countries in which coal so far has played a (relatively) minor role, but which are planning to expand coal use in the future. Ayhan and Jacobs elaborate how in **Kenya** the ruling elites' vision of modernization and industrialization promote coal use. Yet, resistance by civil society against local environmental impacts has thus far successfully prevented the implementation of the government's plans. For the **Philippines**, Manych and

Jakob emphasize the key role of oligarchs dominating all aspects of economic life. These powerful vested interests have influenced energy policy in favor of relatively expensive coal, in spite of a liberalized power market. Dorband et al. analyze how in **Vietnam** a state-controlled electricity sector allows vested coal interests to exercise substantial influence on energy policy. This creates regulatory conditions that are highly disadvantageous for alternative energy sources, allowing the incumbent coal industry to fend off competition from increasingly cost-competitive clean energy sources.

Part IV assembles analyses of countries with a strong focus on coal exports. For the case of **Australia**, Christoff shows that there is a strong support for exported coal, whereas domestic coal use is increasingly challenged by low-cost renewables and environmental concerns. Puerto-Chaves and Corral-Montoya show that even though to date **Colombia** uses little coal domestically, its well-established export industry in combination with an economic structure geared toward extractive industries provide an impetus to expand domestic coal-fired capacities. These developments stand in stark contrasts to the country's declared interest to contribute to global climate change mitigation efforts. **Indonesia** is a further coal exporting country aiming to ramp up domestic capacities considerably. The chapter by Ordonez et al. argues that these plans are to a large extent driven by vested interests, such as politically well-connected owners of coal mines and regional governments dependent on royalties from coal extraction. In addition, expansion of coal capacities plays a key role in the president's plans to boost the country's economic development by means of infrastructure provision. For **South Africa**, Hanto et al. point out emerging support for renewable energies from liberal parts of the government, international investors and the civil society. Nevertheless, employment and revenues from coal extraction, combined with a powerful state-owned utility adverse to alternative energy sources as well as coal's close relation to black economic empowerment policies, provide powerful incentives for policy makers to delay a transition to clean energies.

In the final chapter, we offer some tentative conclusions that can be derived from these studies and discuss possible policy implications. Each case study on its own can provide important country-specific insights. We hope that – in addition to spurring research in countries that are not included in this volume – this rather unique compilation of case studies can also prepare the ground for future comparative work. Such a research effort might help to distill characteristic patterns of how specific constellations of actors, objectives and context factors influence policy outcomes in a systematic manner. The results would not only provide insights that are valuable from an academic point of view but might also be highly relevant to assist the design of coal phase-out policies.

Note

1 Sections "Different approaches to understanding political economy" and "The AOC framework" draw on the article Jakob et al. (2020). We gratefully acknowledge permission to reproduce parts of the content from Elsevier.

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Part I

Countries phasing out coal

2 Late and expensive

The political economy of coal phase-out in Germany

Lukas Hermwille and Dagmar Kiyar

Introduction

Coal used to be the backbone of the German electricity system. In the late 2000s still, Germany saw a "dash for coal" with soaring investments in new plant capacities (Pahle 2010). While Germany has a long history of managing the decline and ultimately phase-out of hard coal mining, the future of lignite mining was contested. However, until recently there was no formal policy process in place to debate the final chapter of coal phase-out. The adoption of the Paris Agreement with its ambitious 1.5°C target has contributed to raising political attention. Ultimately, the German government decided to appoint a "Commission on Growth, Structural Change and Employment" – hereafter coal commission – to settle what had become one of the most contested environmental issues in recent history (see also Leipprand and Flachsland 2018). The coal commission was first proposed as part of Germany's long-term low-emission development strategy (*Klimaschutzplan 2050*) (BMU 2016) and subsequently included in the 2018 coalition agreement of the new German federal government (Christian Democratic Union [CDU], CSU and SPD 2018) after featuring prominently during the election campaign.

The commission was appointed in June 2018 with a mandate to come up with measures that minimize the mitigation gap for meeting the German emission reduction target for 2020 and to ensure the attainment of the 2030 target (BMWi 2018). The commission was set up independently from the German federal government but received logistical and substantive support from the Federal Ministry for Economic Affairs and Energy (BMWi) and other ministries. The commission comprised 28 members who were selected to represent all major stakeholders (BMWi 2018). Moreover, the commission meetings were open for participation by legislators from the federal level as well as members of subnational governments, including from federal states. Those guests had the right to speak but not the right to vote on the final results. Internally, the discussions were prepared and driven by two "friends of the chair" working groups, one focusing on structural policy and the support for coal regions and one focusing on energy and climate policy aspects. These

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groups discussed key aspects of the phase-out schedule, particularly in the final phase of the commission when they met two times a week [san4, pean2].

The coal commission finally adopted its recommendations on 26 January 2019 (Kommission Wohlstand and Strukturwandel und Beschäftigung 2019; see also Litz et al. 2019). The hard-fought compromise was adopted by near consensus (only one member voted against it). Key recommendations include:

- a moratorium on new coal infrastructure and to phase out coal no later than 2038 with an option to bring forward the phase-out to 2035;
- closing 12 GW out of 43 GW of coal capacity by 2022;
- a continuous decline of coal capacity to 17 GW by 2030 with a substantial intermediate step in 2025;
- negotiated compensation for operators of coal-fired power plants; and
- financial support for structural adjustments in coal regions to the amount of € bn 40 over a 20-year period.

In the German political discourse, the coal phase-out decision was viewed favorably by most commentators (see e.g. Spiegel Online 2019; Handelsblatt 2019). But from an international perspective, observers were puzzled by the late final phase-out date. Clearly, the coal phase-out schedule is too slow to meet Germany's mitigation obligations (Höhne et al. 2019; Yanguas-Parra et al. 2019). A Paris Agreement compatible coal phase-out would have translated to a phase-out by 2030 at the latest (Climate Analytics 2018). According to Moore (2020), Germany is one of the seven countries blocking the European energy transition, which are responsible for 80% of the European Union's (EU's) power sector emissions. Besides Poland and Czechia, Germany will be one of the three countries that will contribute to a total amount of 90% of EU coal generation in 2030.

Also, the recommendations of the coal commission come with a hefty price tag. Litz et al. (2019) estimate that public policy cost may add up to € bn 69–93 over a 20-year period (€ bn 40 for structural support, € bn 16–32 for compensating the increase in electricity prices, € bn 5–10 for compensation for utilities, € bn 5–7 early retirement compensation for workers, € bn 3–4 to buy up excess emission permits in the EU Emission Trading System).

While these figures are impressive in absolute terms, they also need to be seen in context. Not all of the funding for structural adjustments is altogether new. As it is an economically weak region, Lusatia would have received funds for structural adjustments in any case. Furthermore, the financial implications of the coal phase-out need to be seen in the historical context of massive fossil fuel subsidies. Oei et al. (2020) highlight that between 1950 and 2008 subsidies for hard coal production amounted to € bn 289–331, that is, € bn 5–5.7 per year over that extensive period.

Still, the recommendations reflected a carefully balanced compromise. The members of the commission and many observers, including the prime ministers of the affected federal states, were adamant that the federal government needed to implement the exact recommendations promptly and without deviation, but that is not what happened.

The recommendations regarding structural policy were implemented relatively quickly. The federal government adopted the draft of the law on supporting structural change in coal regions already in August 2019. Formal parliamentary adoption was supposed to coincide with the adoption of the coal phase-out law covering the energy policy aspects of the recommendations. This, however, was significantly delayed. Both the law for supporting structural change in coal regions and the coal phase-out law were adopted in July 2020, more than one year after the conclusion of the coal commission.

These delays already rendered some of the short-term measures proposed to close the gap for the 2020 target obsolete. Also, in May 2020 the newly built Datteln 4 power plant began regular operations (Handelsblatt 2020) thus violating the recommendation for a moratorium on new coal infrastructure. The actual phase-out law also no longer foresees a linear and continuous reduction pathway with a substantial intermediate step in 2025.

These deviations led 8 out of 28 members of the coal commission to issue a statement in which they harshly criticize the implementation of the coal phase-out law.

> Climate protection was already taken into account insufficiently in the coal commission. It is irresponsible to extend this agreement further and damage climate protection. The social peace achieved by the compromise is a valuable asset that must not be given up lightly.
>
> (Praetorius et al. 2020, 4; see also Grothus and Setton 2020)

This chapter employs a political economy analysis based on the framework developed by Jakob et al. (2020) explained in Chapter 1 to uncover the role of key actors, their interest and the ecological, socioeconomic and political-institutional context in which the political struggle for phasing out coal played out. This political economy lens will help us to answer the questions, why the German coal phase-out was scheduled so late and why it was so expensive.

The analysis builds on a total of 18 semi-structured interviews with 19 individuals covering a wide range of stakeholders, most of them being part of the coal commission (see Table 2.1).[1]

Table 2.1 Overview of interviews held between March and August 2020

Code	*No. of interviews*	*Description*
pmn	2	Policy maker national: Ministry of Environment, Ministry of Economy
pmr	3	Policy maker regional: state-level ministries (2), municipality in the region (1)
pean	4	Private economic actors (national): utilities (2), industry associations (2)
san	10	Societal actors (national): environmental NGOs (2), local initiatives (2), trade unions (5), research organizations (1)

National context

Historical legacies

Germany has a long history of hard coal and lignite utilization. At its peak in 1955, the hard coal industry employed almost 600,000 people in mining; the last remaining mine was closed at the end of 2018. For lignite, it was more than 160,000 at the peak in 1985 and around 20,000 in 2019 (including employees in power plants) (Brauers et al. 2020). The share of coal in the gross power production has gone down over the last decades to 91.7 TWh or 16.3% from lignite and 42.5 TWh or 7.5% from hard coal in 2020 (Appunn et al. 2020). Although renewable energy share in gross power consumption is at 46.2% in 2020 (Hein et al. 2021), lignite is sometimes still referred to as the only remaining domestic energy source in Germany (Kiyar and Wittneben 2015).

The German electricity market was opened up for market liberalization with the German Energy Industry Act in 1998. After several mergers, four dominant utility companies ("the Big Four") emerged: E.ON AG, RWE AG, EnBW AG and Vattenfall GmbH (later LEAG).[2] The portfolio of the Big Four continues to be dominated by fossil-fuelled and nuclear power plants. Especially in the first years after the liberalization, those four companies only very reluctantly invested in renewable energies (Hirschl et al. 2011) despite generous incentives provided according to the Renewable Energy Sources Act (EEG) introduced in 2000.

The Fukushima Daiichi nuclear disaster in March 2011 meant another decisive shift for German energy policy (Kiyar 2014; Hermwille 2016). Only half a year prior to the accident the German government had produced an *Energy Concept* which formulated mid- and long-term emission reduction targets for 2030 (–55%), 2040 (–70%) and 2050 (between –80% and –95%) (BMWi and BMU 2010) and extended the lifetime of nuclear power stations. This latter decision was rolled back quickly after the Fukushima accident, but the climate targets were maintained.

Besides these national policies, Germany is also a member of the EU and hence subject to the framework of EU energy and climate policies. Specifically, large combustion facilities in the power and industry sectors are part of the EU Emissions Trading System (ETS). With the adoption of the "2030 Climate Action Target Plan" in December 2020, the EU has further raised the ambition of its climate target to –55% compared to 1990 levels by 2030 (EC 2020). According to several respondents, the increased ambition of the EU and consequently higher carbon prices in the EU ETS may well render the phase-out schedule obsolete and significantly accelerate the end of coal in Germany [e.g. pmn1, pmn2, pean3].

Ecological context

Germany has traditionally had a strong environmental movement. It first came to prominence in the 1970s and 1980s in the form of an early ant-inuclear movement and has continued to hold significant political power not least through the foundation and subsequent electoral success of the Green party in Germany (Schreurs 2012; Uekötter 2014). This influence of the environmental movement has contributed to the perception, both internally and externally, of Germany being a global climate leader even when over the last decade or so, this leadership was more rhetorical than founded in actual progress (Handelsblatt 2018). Consequently, the discussion of coal phase-out was clearly framed in the context of the Paris Agreement. In fact, the call for a commission to determine the coal phase-out was first anchored politically in Germany's long-term low greenhouse gas development strategy that was submitted to the United Nations Framework Convention on Climate Change (UNFCCC) in 2016. This is also reflected in the mandate of the coal commission, which clearly determines the attainment of the German emission reduction targets for 2030 as a key objective. But nuance is important here: the mandate of the coal commission referred to the German domestic climate targets, which date back as far as 2010 (BMWi and BMU 2010), and consequently were not aligned with the increased ambition of the Paris Agreement.

Another important ecological context, especially during the negotiations in the coal commission, was the iconic battle for the Hambach Forest at the fringe of the Hambach lignite mine in the Rhineland. Local activists managed to mobilize some 50,000 participants demonstrating against the clearing of the forest (Aachener Nachrichten 2018) positioning the issue on the top of the political and public agenda.

Still, our respondents disagreed about the effect this had on the immediate negotiations in the coal commission. One respondent opined that at some point the protests threatened the continuation of the negotiations [pmn1], another characterized it as "accompaniment" [san1] while another stated that the protest did not play a significant role for the outcome of the negotiations [san4]. Several interviewees were annoyed by the topic of the forest [san7, pmr3, pmr1], as it was too much in the center of the discussion, "a very cleverly staged campaign" [san7].

Socioeconomic context

Generally, the political discussion on the phase-out of coal occurred during a phase of economic stability and growth which facilitated the discussions because there was a sense of resources being available for compensation [san4–6, pean3]. However, the circumstances differ significantly between the different mining areas. The Rhenish mining area is located between three economically strong urban centers (Cologne, Düsseldorf and Aachen) each with a diverse industrial base. Meanwhile, Lusatia, the other major German lignite mining area is a peripheral and rural region with only limited industrial activity not directly related to coal (Stognief et al. 2019; Oei et al. 2019). This much more dire prospect of the Eastern German mining regions has been highlighted by almost all respondents.

This is further compounded by the Eastern German legacy of transformation after the German unification in the early 1990s. In 1990, then German Chancellor Helmut Kohl famously promised "blooming landscapes" in Eastern Germany in an attempt to soothe the concerns of citizens of the late German Democratic Republic over the future of their jobs and social security (Bundesregierung der Bundesrepublik Deutschland 1990). What followed was a massive transformation and in many places outright collapse of Eastern German industries. In many instances, this transformation was managed or in the eyes of many Eastern Germans forced through by Western German experts. And the Eastern German lignite industry was no exception. Within five years after the unification, the coal industry imploded from 140,000 employees to below 40,000 and production fell by 200 million tons per year (Herpich et al. 2018). "In Lusatia, the wolf came, but not blooming landscapes" [san8]. Coal mining is the last industrial core in Lusatia, after 5,000 jobs were lost in the textile combine from one day to another and 25,000 jobs in the glass industry. The ruins of the glass industry are still standing; it reminds people of what happened [pmr3].

Consequently, the Eastern German discourse on coal transitions is marked by what can be summarized as "transformation fatigue".

> People in these regions have already been through 30 years of transformation. Some of them have had to do different jobs in their professional careers, have retrained, have reoriented, have moved, have changed their lives and do not want to have to go through another transformation now. [san1]

For some stakeholders, the very terminology of transformation seemed to be political scorched earth [san8].

Political and institutional context

The political debate on coal was overshadowed by the rise of right-wing populism particularly in Eastern Germany [all respondents]. The far-right Alternative für Deutschland (AfD) gained strong support at the expense of established parties, particularly of the CDU, and even became the strongest party in some areas of Eastern Germany. Among other things, this upturn is also linked to the historical experience of the transformation of the Eastern German economy after 1990 (Weisskircher 2020). Populism is marked by a strong separation of "the ordinary people" vs. the outside elite (Mudde 2004). The coal phase-out being imposed on the region from Berlin, Brussels or Paris clearly resonates well with this foundation of populist attitudes. While the AfD was not involved directly in the negotiations, the fear of further strengthening the AfD was always present and had a lasting effect (see also Rosa-Luxemburg-Stiftung 2019).

Perhaps the most important institutional context for understanding the German coal phase-out is German federalism. Although the German federal states had no formal role in the coal commission, they exerted tremendous power and were clearly a major political force in shaping both the phase-out schedule as well as the compensations for structural adjustments in the mining regions (see discussion below).

Key actors and objectives

Societal actors

Environmental groups

A key driver of the political debate on coal phase-out was the strong environmental movement. However, the environmental movement is not a uniform block, but a rather heterogeneous alliance [san3, san4, pmr1, san7]. It includes organizations such as Greenpeace with a focus on broad ecological issues and climate change as a systemic issue, as well as organizations with a much narrower focus on the conservation of particular ecosystems. Part of the wider environmental coalition were also local groups such as "Alle Dörfer bleiben" fighting to save those villages falling victim to the expansion of the open cast mines [san1, san10]. The main objectives of the environmental movement are to accelerate the phase-out of coal in line with the Paris Agreement's 1.5°C goal and to safeguard local habitats (most saliently the Hambach Forest, see above) and villages. Some of the more radical actors also called for a more fundamental "system change" calling capitalism itself in question [san2, san3, san8, san9].

Closely associated with the environmental groups were several environmentally oriented research organizations that have conducted a host of studies covering nearly all aspects of the energy transition in general and coal phase-out in particular (Leipprand et al. 2017). This knowledge was the foundation for an objective and fact-based debate [san1, pean1, pean4].

Trade unions

Organized labor played a major role, in part in collaboration with environmental groups, in part in opposition to them. As one respondent put it: "the trade unions need to manage a balancing act between social responsibility for climate protection, and on the other hand responsibility for the employees, not only in the coal industry itself but also in the energy-intensive industry" [pmr2]. But not all jobs are created equal: jobs in the coal industry are particularly well-paid – a shift manager's wage in the German lignite sector can be comparable to a university professor's pay [san4, pean1, pmr3]. Also, they have many other benefits and many workers are unionized [san5, san6]. Yet, unions also recognize that the fight cannot be about salvaging the same jobs, but to create adequate alternative employment [san8]. Moreover, the unions were concerned about jobs in other energy-intensive industries that may be threatened by increased power prices as a result of coal phase-out.

Three labor organizations were represented in the coal commission: the mining, chemical and energy industry trade union (IGBCE) representing the workers in the mines and heavy industry (except steel). For IGBCE, coal phase-out may be an existential question, at least on the level of some of its local groups. Also represented was Verdi, the union of the service industry and Germany's largest trade union. Verdi's constituents will also be affected indirectly, if coal phase-out leads to significant economic downturn in the mining regions. On the other hand, Verdi represents many of the potential alternative jobs mentioned above. Finally, Deutscher Gewerkschaftsbund (DGB), the umbrella organization of German trade unions, was also represented.

Due to the diverse interests represented in the labor movement, many environmental NGOs had hoped to form a coalition with more progressive labor unions and isolate those interests that wanted to slow down the phase-out (especially in the IGBCE) [e.g. pmn1, san4]. However, organized labor invested heavily in coordination between the different unions as well as between their respective local, regional and national organizations and successfully managed to speak with one voice [san1, san5, san6, pmn2], and that voice was dominated by the IGBCE's position "that no one [of the employees in the coal industry] should fall into the void" [san7, pean4, pmr1]. Particularly, the IGBCE's representative Michael Vassiliadis with his long-term negotiation experience was characterized as "as a power in his own right" [pean1].

Industry

Several industry associations were involved in the discussions, most notably the Federation of German Industries (BDI) who previously also participated in German energy policy debates inter alia by commissioning studies outlining ambitious pathways (BCG and Prognos 2018). Concerning the coal phase-out their main objective was about maintaining affordable electricity prices potentially impinging on industrial competitiveness and particularly about secure electricity supply [san2–6, pean3] and the future of the employees in the coal industry [san7, pean4, pmr1]. However, industry representatives overall seem to have embraced or at least accepted the long-term need to decarbonize and achieve climate neutrality [pean3], a surprising deviation from previous analyses that saw German industry associations as strong defenders of the status quo (Leipprand and Flachsland 2018).

Utilities

Utilities are an obvious group of actors relevant for coal phase-out. But again, the group of actors is more diverse than it might seem. Being directly affected, RWE and LEAG, the two major utilities running the lignite mines and power plants, were not directly represented in the coal commission [pean1]. The two utilities were only represented indirectly by the German Association of Energy and Water Industries (BDEW) which also represents many smaller energy companies, many of which are heavily invested in renewable energy and natural gas [pean1]. The same holds for the German Association of Local Public Utilities (VKU). Notably, the operators of hard coal power plants were not particularly vocal in the phase-out negotiations and hence were considered as one of the losers of the phase-out [e.g. pean3].

Again, the objectives of the utilities were diverse. RWE and LEAG were obviously interested in extending the coal production, not necessarily because they opposed the phase-out per se, but because they wanted to maximize compensation payments [san10]. RWE has been characterized as a company with strong foothold but also strong responsibility in the region. One respondent has described it as a social contract: RWE will mine lignite and the region endures the side effects, including ecological damage and relocation. On the other hand, RWE invests in, for example, cultural activities and allows for a degree of participation [san2]. Moreover, RWE is closely linked to several municipalities in the Rhineland and in the Ruhr area (16% of RWE still being in the hands of municipal shareholders), and with these shares in the company they relied on dividends for part of the regular budgets in the past [pmr2, pmn1, san2, san3, pean4]. But most importantly, perhaps, RWE has started to develop alternative business models, has invested in renewable energies internationally [pean4] and intends to stay in the energy business and continue to operate also in the region [pmr2].

Meanwhile, LEAG is owned by a Czech financial investor and to date has developed much less of a proactive vision for its future beyond coal. According to one respondent, the investors of LEAG never intended to make money out of the coal business but from withdrawing capital and extorting financial support from the state [san3] (see also Greenpeace 2018). Even if this is true for the investors, it does not necessarily hold for all of LEAG's employees, many of whom have deep roots in the region and are genuinely concerned about the economic and social outlook of the region [pean4]. Like RWE, LEAG maintains close ties with regional governments. A case in point is the appointment of Stanislaw Tillich, former Prime Minister of Saxony and cochair of the coal commission, as LEAG's chairman of the board only months after the conclusion of the coal commission [san3, san4].

Political actors

Political parties

A striking result of our interviews is the fact that none of our respondents highlighted the role of the political parties. Political parties did not play a very overt and strategic role, because the conflict lines did not seem to fall *between* but *within* the major political parties, at least the SPD and CDU. This conflict made it impossible for the government to resolve the issue on its own and hence made the coal commission necessary in the first place [san4].

While the major political parties did not engage openly in the conflict, that does not mean that party politics did not play an important role in the process.

However, these politics played out mostly behind closed doors within the various federal and state-level ministries involved.

Perhaps an exemption from the rule is the far-right populist AfD. While the AfD played hardly an active role in the political debate, it cast a long shadow over the negotiations. Their political opponents feared that a too ambitious phase-out schedule would drive some voters toward the AfD [pmn1]. The AfD was also perceived as a threat to the trade unions labeling them as traitors of the working class [san8, san3].

Federal government

The political economy of coal in Germany can only be considered in the multi-level governance system. Germany's climate targets must be seen in the context of the EU Nationally Determined Contributions (NDC) and the EU ETS is the key governance instrument in the energy sector. In fact, as one respondent put it: "The whole idea started in a situation where many people realized that the languishing ETS with its low carbon price won't turn the tide for coal" [san1]. However, within the coal commission and also in the public discourse around it, the European dimension played hardly any role [e.g. san3, pmr2, pean3]. The recent uptake of carbon prices only set in during the final phase of the coal commission. After the commission concluded, it became clear that some of the hard-fought phase-out schedules may actually be obsolete [pean2, pmn1, pmn2] (see also Popp and Reitzenstein 2020) and the coal phase-out law became a guarantee or bailout for power plant operators [san1, pean3, san9].

Despite this backdrop, the battle for coal phase-out was fought on the national level. For the German government, the issue was at the intersection of competencies of two ministries. The Ministry of the Environment (BMU; led by the Social Democratic Party – SPD) is in charge of climate policy and has developed the German long-term low emissions development strategy (Klimaschutzplan 2050) for the first time specifying sectoral mitigation targets and recommending the coal commission. Their objective was first and foremost to safeguard that Germany achieves both its domestic targets as well as international commitments. Meanwhile, the Ministry of the Economy (BMWi; led by the CDU) is in charge of energy issues, energy-intensive industries and matters related to structural change and hence was also in charge of the coal commission. While formally, the BMWi also heeded the German domestic climate targets, there were also other more subtle interests at play within the CDU.

The two ministries cooperated well in the initial phase when designing the mandate for the coal commission and selecting its members [pmn1]. But toward the end of the commission and especially in the process of the implementation of its recommendations, nearly all respondents expressed their frustration with delays in the BMWi, "intolerable" [pean3] public consultation procedures for the draft laws with a deadline of just 24 hours, and the significant deviations from the original recommendations [e.g. pean3, san1, san8, san9]. According to respondents from all constituents, these delays and deviations were the result of a conflict within the CDU where many Eastern German legislators were afraid of a populist backlash [e.g. pmn1, pmn2, san1, san8]. On the other hand, some members of the federal government might have speculated that political resistance against coal phase-out from the Eastern German state governments might wane with new political constellations after the state elections in September 2019 [pean2].

Notable is also that during the negotiations of the commission, the Ministry of Finance (BMF) was involved only on the margins. While there was some degree of coordination between the leading federal ministries BMWi and BMU on the one hand and the BMF on the other [san1], it did not participate actively in the negotiations. This is particularly striking because the mandate of the coal commission did not include a budget restriction [san1, pmn2, pean3]. Consequently, the bargaining space between the diverse interests was unrestricted at one particular point. And apparently, not all financial aspects were consulted with BMF ex ante. For example, the issue of buying up excess emission permits in the EU ETS that result from the early phase-out of coal was supposedly not discussed in detail with the BMF before the conclusion of the coal commission, according to one insider [san1].

State-level governments

Below the national level, the Federal States (Bundesländer) played a powerful role in the coal phase-out decisions. Not only were their interests represented by two of the four coleads of the commission by two former state-level minister-presidents [san4] (alongside a researcher and a former federal minister and current executive of Deutsche Bahn). But despite having no official role in the coal commission, senior political personnel of all relevant states (North Rhine-Westphalia, Saxony, Saxony-Anhalt and Brandenburg) actively participated in all meetings of the commission [san1, san4, pean2] to the extent that one state-level representative stated "I definitely see myself as part of the commission and I stand by all of its results" [pmr2]. This strategic and high-level engagement contrasts starkly with the involvement of the federal government who was not as engaged in the commission and criticized for weak leadership by some respondents [san5, san6, san8, pean2].

The main objective of the state-level governments was to make sure that their respective territories would not be deindustrialized and receive adequate compensation and funding to adapt to the imminent structural changes. However, they differed particularly in the way they opposed or embraced changes. Perhaps also due to better starting conditions, respondents observed relatively little hesitation but willingness to engage in shaping the fate of the mining region beyond coal in North Rhine-Westphalia [san1, san4]. Meanwhile, the state governments in the East of Germany were looking to delay the phase-out, to portray it in the grimmest shades of color [san1, pean2] and marked by an "unwillingness to shape the change" [san4, also san1, san3], at least initially. As Haas and Gürtler (2019) point out, despite different party affiliations, the

Eastern German prime ministers formed a coalition and exerted strong influence on the negotiation process. They could wield this power also due to the looming state-level elections in both Saxony and Brandenburg using the fear of strong competition of the far-right AfD as a lever. Moreover, they could follow a particularly aggressive negotiating strategy, because unlike most other involved actors, for them the failure of the commission seemed to be not the preferred but an acceptable outcome [san1].

Two striking examples show how the state-level governments exerted this power. The coal commission was already close to adopting its final report in November 2018, in line with its original schedule. Having no formal right to intervene in the commission itself, the prime ministers met with Chancellor Merkel and successfully requested an extension of the commission mandate (ZEIT Online 2018) [pmr3, pean2]. Even more striking is that according to one of the respondents, prime ministers even intervened on behalf of the utilities in the negotiations on compensation between the lignite power plant operators and the federal government. "You think you are negotiating with power plant operators, but de facto there are still prime ministers negotiating in the background, or something like that, in order to push through regional interests" [pmn2].

Local authorities

Local authorities spoke on behalf of the coal regions. The authorities from the Lusatia region emphasized that the region has the "worst preconditions to successfully shape this structural change. It is always important not only to shape structural change, but to shape it successfully" [pmr1]. Demographic change, the rising of the far-right party AfD (see below) and the shutdown of important industries in the wake of the reunification of Germany have taken their toll on the region. Correspondingly, their main objectives are to get recognition for the dire situation of the region, to develop new visions and, especially, to receive financial support to implement those visions [pmr1, pmr3]. As an achievement of the commission process, one pointed out that they are closely networking with actors in the other coal regions [pmr1].

Discussion and conclusions

The public debate on coal phase-out was highly contentious, even heated, particularly during the massive protests in the Hambach Forest. But the interviews highlighted that there were no clear negotiating blocks and polarized confrontations in the coal commission. When asked about his opponents in the political conflict, one interviewee [san4] highlighted that this term was unfitting for the situation and another [pean2] highlighted that a vast majority of actors were interested in the resolution of the conflict and there were overlapping objectives between all involved actors. All seem to have accepted the mandate of the commission, namely to ensure that Germany will meet its climate change objectives. Still, respondents highlighted the high degree of emotionality of the debate [pmn2, san8].

While the analysis did not reveal any directly opposed objectives, their prioritization varied distinctly between the main actors:

- The **environmental objective of meeting the German climate change objectives** was accepted by all actors [pean2], but while especially the environmental groups considered the Paris Agreement and the 1.5°C target as a benchmark, most others considered much less stringent German domestic target as a condition for success.
- The **regional economy objective of supporting structural adjustments** in the coal regions was carried by a broad alliance of actors. For trade unions, it meant to compensate coal workers and create opportunities for other sectors. For utilities, it meant to delay change and maximize compensation payments. And for regional and local governments, it meant maximizing support for structural change.
- The **industrial competitiveness objective of maintaining secure and low-cost electricity supply** for the wider industrial economy was again supported by a wide range of actors, most prominently by the various industry associations as well as the BMWi and the state-level government of North Rhine-Westphalia, an industrial powerhouse also beyond the coal industry.
- Finally, a less overt **political objective of keeping the far-right AfD in check**, particularly in Eastern Germany, was shared by all surveyed actors but prioritized strongly by Eastern German state governments as well as within the federal government, particularly the BMWi.

In this chapter, we set out to assess why the German coal phase-out is scheduled so late and why it is so expensive. The main reason for this is the dominance of the regional economy objective over the other objectives. First, the proponents of the regional economy objective were able to leverage strong support also by those actors most concerned about the political objective of keeping the AfD in check. The AfD is particularly strong in the Eastern German lignite regions and it rejects the coal phase-out as such [pmr1]. Owing in part to the history of transformation of Eastern German regions in the aftermath of the German reunification, there is deep scepticism and "transformation fatigue" among the population. The coal phase-out is not accepted in the population in the Eastern coal regions; it's tolerated, they endure it but policy did fail to make the issue transparent and has not transformed it into a regional issue [pmr3]. The late implementation of the structural change and coal phase-out laws was hard to understand and criticized by all respondents, but cause for particularly bitter resentments in the Eastern coal regions [pmr1, pean1]. A slower phase-out schedule and strong support for the regions were seen by many powerful actors as an antidote to the growing populist movement [pean1].

Second, there was a friendly coexistence with the proponents of the industrial competitiveness objective. Currently, coal-based power generation ensures secure and cost-effective supply for a competitive industrial economy. Maintaining this status quo for a little longer is therefore well-aligned with the objective. On the other hand, the economic competitiveness objective played a secondary role only, because a wide range of scientific studies showed that a faster phase-out schedule also does not necessarily threaten security of supply even when considering the simultaneous nuclear phase-out (Pietroni et al. 2017; Kopiske and Gerhardt 2018; Climate Analytics 2018; Agora Energiewende 2017).

Finally, a late coal phase-out is obviously at odds with the environmental objective. However, this objective and its main proponents were in a sense muted by the way in which the objective was included in the mandate of the coal commission, which defined the dated German domestic climate targets as the benchmark for success. Discussing the adequacy of this target in the light of the more ambitious 1.5°C target of the Paris Agreement was out of bounds within the coal commission and would have thwarted any attempt to achieve a consensus according to some of our respondents [e.g. san1]. And the less stringent domestic climate targets left enough leeway to adopt a relatively slow phase-out schedule. Also, environmental groups generally supported the argument for structural support for the coal regions, albeit not as an argument to delay but to accelerate coal phase-out (see also Leipprand and Flachsland 2018).

Another reason for the late date and high costs of the phase-out was that the proponents of the regional economy objective were able to benefit from the institutional setup of the coal commission as well as the German federal system. Prima facie one could expect that subnational governments were sidelined in the process as they were not included formally in the coal commission. Yet, they managed to exert influence both inside and outside the commission in at least three ways. First, their interests were in part reflected inside of the commission by two of its chairs, former prime ministers of Saxony and Brandenburg respectively. In the words of one of our respondents, they "had completely dropped out of their role as chairmen. At 12:30 a.m. (of the final night of negotiations) they sang the Song of Songs of the Culture of Coal" [san1]. Second, while not being formal members, high-level representatives of the affected states participated in all meetings. They did not have the right to vote on the final report, but they made sure that their interests were nevertheless reflected [pmr2, san4, pean2]. Their success surprised even their counterparts from the federal government [pmn2]. They also benefited from the negotiation dynamics and the less than transparent way in which the negotiations were conducted. Previous drafts of the commission report had proposed structural funding of € bn 1 per annum for 20 years. But during the final day of the negotiations that figure was changed to two billion. This increase was never debated in the plenary of the commission [san4]. This was clearly enabled by the absence of budget constraint in the mandate of the commission as well as the lack of direct involvement of the BMF. Finally, the prime ministers intervened at the highest political level with Chancellor Merkel to demand an extension of the mandate of the commission when nearing the original deadline, they were unsatisfied with the results particularly with regards to the financial support provided for the coal regions.

Overall, the German experience is perhaps not exemplary in how a phase-out decision should be achieved, but it certainly is exemplary of what to expect. While the eventual end of coal mining and utilization in Germany now seems to be widely accepted, the pace of phasing out coal was and still is highly contested, and it will almost certainly be in every other country. Our analysis of the political economy of coal in Germany has laid bare the main drivers and avenues of power that the key actors used to negotiate what is neither a cheap nor a swift goodbye to coal.

Appendix

This chapter contains supplementary online material at www.mcc-berlin.net/pecoal/ch02.

Notes

1 The interview guidelines for the semi-structured interviews are available online as supplementary material.
2 In 2016 Vattenfall sold its lignite assets to Czech energy conglomerate EPH and PPF investment group which subsequently formed a subsidiary LEAG to operate the Eastern German coal mines and power plants.

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3 The political economy of coal in Bulgaria

The silent phase-out

Toma Pavlov

Introduction

To achieve the European Union's (EU) ambitious goal of carbon neutrality by 2050, Bulgaria will have to replace over a third of its power generation capacities. Coal-fired power plants provide on average 40% of the electricity generation (up to 60% during cold winter months) and have been essential providers of baseload energy for over five decades (EWRC 2019). With over 15 000 jobs in mining and power plants and approximately twice as many indirect jobs, Bulgaria is expected to be one of the most impacted EU Member States by a phase-out of coal (Vladimirov, Galev, and Primova 2020). Bulgaria's National Energy and Climate Plan (NECP) for 2021–2030 envisions the "full use of the existing potential of indigenous coal, which is sufficient to generate electricity for the next 60 years" (MoE and MoEW 2020, p. 25). At the same time, the increase in the price of allowances under the EU's emissions trading scheme (ETS), coupled with the underlying indebtedness and inefficiency of the coal industry, has resulted in soaring financial losses for power plants and mines. Domestic political decision makers have nonetheless demonstrated a willingness to go to extraordinary lengths in order to keep the industry afloat, even if some of its support is likely to be deemed a form of illegal state aid by the European Commission (Peeva 2020).

To better understand the continuous resistance to a shift away from coal, the present study investigates the political economy drivers of the coal regime in Bulgaria. Notwithstanding the lack of political willingness, the country has fully subscribed to the EU's carbon-neutrality goal (European Council 2019). Despite the favorable geographical conditions and the falling technological costs, Bulgaria has been reluctant in the introduction of renewables and has previously imposed numerous regulatory and administrative barriers after a rapid "boom and bust" deployment period (Couture, Pavlov, and Stoyanova 2021). The contradictory policy stances make Bulgaria a particularly interesting case study that requires looking beyond the techno-economic and innovation perspectives of energy transitions and analysing the role of sociopolitical factors.

The survey of literature shows that Bulgaria's coal regime has remained largely understudied. While there have been a few case studies on the

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Bulgarian energy sector, their focus has mainly been the mismanaged policy on renewables during the 2009–2012 period (Hiteva and Maltby 2017; Andreas, Burns, and Touza 2018; Ivanov 2019). For example, Ivanov (2019) stresses the negative role of state capture in the energy sector during the rapid introduction of renewables, where support schemes went to politically connected entrepreneurs. Outside the academic literature, various policy reports by the Center for the Study of Democracy in Bulgaria have shed light on key governance issues in the energy sector throughout the years (CSD 2017, 2018; Stefanov et al. 2014), including providing an assessment of the draft version of Bulgaria's NECP (Vladimirov, Galev, and Stefanov 2019). In a country report on low-carbon transition, Heilmann, Reitzenstein, and Ámon (2019) analyze three categories of Bulgaria's political economy – national conditions, political system, and external projection. Based on a mapping of threats and opportunities, the authors argue that most political economy factors stand in opposition to a transition to a low-carbon economy. The present study contributes to the developing literature on political economy drivers in energy transitions (Brauers and Oei 2019; Leipprand and Flachsland 2018; Lockwood, Mitchell, and Hoggett 2019). While other European countries, including Germany, Poland, Spain, and the United Kingdom, have already been studied (Brauers, Herpich, and Oei 2018; Rentier, Lelieveldt, and Kramer 2019), this is the first case study to provide an in-depth analysis on the political economy of coal in Bulgaria.

Methodology

The study adopts the political economy framework by Jakob et al. (2020) covered in Chapter 1 that comprises a three-step approach: (1) identifying key actors with stakes in the policymaking process, (2) mapping of the actors' underlying objectives, and (3) assessing relevant contextual factors that influence policymaking. The framework is operationalized in two steps. First, a design of an interview guideline used in 20 semi-structured expert interviews with actors from government, business, civil society, and the EU, who shape the climate and energy policies of Bulgaria; and second, an extensive review of government documents, financial reports, media coverage, and relevant databases to verify the information from the interviews as much as possible and substantiate the analysis.

Following the interviewing approach of Bogner, Littig, and Menz (2009), the research questions were first translated into an interview guideline, divided into five parts: (1) objectives and priorities, (2) actors, (3) policy content, (4) policy formulation, and (5) contextual issues. Context-specific questions were included based on ongoing debates concerning the energy sector and were varied by the type of actor interviewed (see online Appendix A.1 for interview guideline translated into English). Any information that can be linked to the subjects' identity was anonymized.

Relevant interview partners were identified based on a detailed desk research and a preinterview with a local energy expert, which was also used to refine the interview guideline. The majority of the interviews, 13 out of 20 in total, were conducted in-person in Sofia over the course of January 2020 and had an average duration of 60 minutes.[1] The remaining interviews were conducted in the months of February and April 2020 over the phone, due to limited availability (online Appendix A.2 provides a list of actors by type, organization, and date of the interview).

Country context

To better understand the underlying contextual factors influencing the coal regime in Bulgaria, this section provides a concise overview of the power sector and electricity sector in a historical perspective.

Power sector overview

Bulgaria has a well-developed power sector with a diverse energy mix consisting mainly of lignite-fired thermal power generation, nuclear and renewable energy. Lignite-fired thermal power plants (TPPs) provide, on average, nearly 40% of the electricity annually, while the country's only nuclear power plant (NPP Kozloduy) contributes another 36% (Figure 3.1b). In addition to the strong baseload component comprising coal and nuclear, the country relies historically on a system of hydropower plants (HPPs), including three pumped-storage plants, that work in tandem with the baseload plants and cover peak demand. Under a preferential feed-in-tariff scheme, a rapid expansion of renewable energy sources (RES), including smaller hydro, wind, and solar power plants, took place between 2010 and 2012. This led Bulgaria to reach and exceed its 2020 RES target already in 2013 when the RES share in gross final energy consumption was 19% – three percentage points higher than the 2020 target (Eurostat 2020b).

Coal is Bulgaria's only significant proven reserve of primary energy. Large deposits of low-grade lignite coal are found in the Maritsa East basin, located in the southeast of the country, along with smaller deposits in the southwest. Compared to the lignite coal mined in the rest of the EU, Bulgaria's is ranked among the lowest in terms of calorific values (Alves Dias et al. 2018). With the exception of lignite coal, Bulgaria imports almost all other energy carriers (crude oil, natural gas, and nuclear fuel) from a single trading partner – the Russian Federation (EC 2017).

Despite having reduced its greenhouse gas emissions (GHG) already in the 1990s, as a result of the structural change of the postcommunist economy, Bulgaria is the most resource, energy, and GHG emission-intensive economy in the EU. The national economy needs 3.8 times more energy and produces 4.4 times more carbon emissions per unit of GDP than the EU average (EC 2020b). Nearly half of the national GHG emissions in 2017 came from the

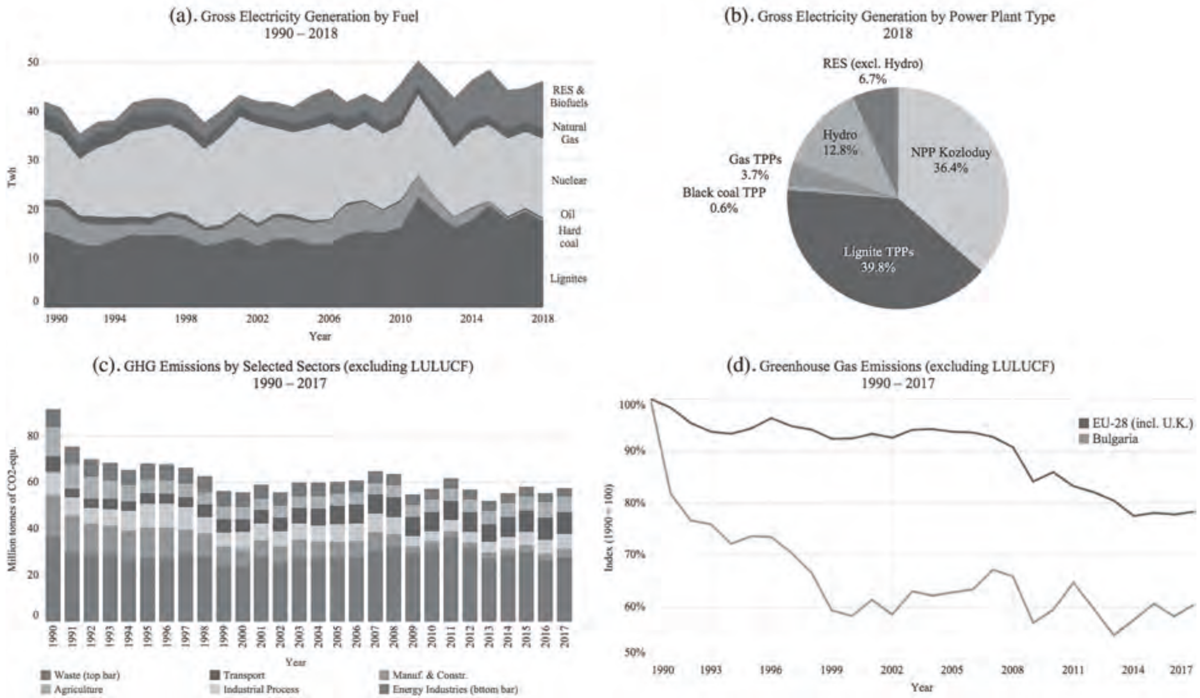

Figure 3.1 Key power sector statistics.

Note: (a) Gross electricity generation by fuel over time. (b) Gross electricity generation by power plant type in 2018. (c) GHG emissions by sector (excl. LULUCF) over time. (d) GHG Emissions Trends (excl. LULUCF; Index 1990 = 100).

Source: Author's representation based on data for (a), (c), (d) from DG Energy (2020) and for (b) from EWRC (2019).

energy sector with the production of electricity and heat from coal accounting for more than 90% of the emissions (MoE and MoEW 2020).

Bulgaria has a network of thermal-based power plants throughout its territory (Figure 3.2), including in most major cities where they supply district heating. Built mostly in the 1950s and 1960s, the majority of the plants are coal-fired with some having switched to natural gas later on. There are 38 power generation units in 11 coal-fired power plants with an average age of 39 years (EC 2020b).

The Maritsa East Energy Complex hosts the largest lignite mining and lignite-fired power plant area in southeast Europe. The Complex features three of Bulgaria's biggest TPPs, as well as a fourth, smaller, one. The mines and the power plants are interdependent, as the output from the mines is almost entirely sold to the power plants. All mines are part of the state-owned Mini Maritsa East, along with TPP Maritsa East 2, which is the biggest power plant in the Complex in terms of capacity. The rest of the plants are majority privately-owned with two being foreign-owned. In terms of employment, the Complex concentrates approximately 85% of all jobs in the Bulgarian coal sector.

Notably, the state-owned TPP Maritsa East 2 employs close to 2 400 people, while the second biggest privately-owned TPP ContourGlobal employs only around 400 people (AOBE 2020). Most of the employees in the Complex come from the nearby city of Stara Zagora, which is the sixth biggest city in Bulgaria and its economy is heavily reliant on the activities of the Complex.

Electricity market structure and governance

The electricity market in Bulgaria is the only one in the EU to consist of both a regulated segment and a free market one, where prices are defined along the entire chain (see Figure 3.3). Since Bulgaria's accession to the EU, prices have been gradually liberalized for industrial and business consumers, while prices for households continue to be set by the formally independent Energy and Water Regulatory Commission (EWRC).

In the regulated segment, electricity prices are defined along the entire production chain to final consumption, with the state-owned National Electricity Company (NEC) acting as a public supplier. NEC procures electricity at prices determined by the EWRC (hereinafter the regulator), from generators it owns or through long-term power purchase agreements (PPAs) with privately-owned generators and then sells the electricity to the end suppliers at fixed regulated prices. While the transmission network is owned and operated by a state-owned company, the distribution and supply of electricity is divided among three privately-owned companies, which have a regional monopoly. Bulgaria's household electricity prices have persistently been the lowest in the EU (Eurostat 2020c).

State-owned enterprises (SOEs) dominate the electricity market in Bulgaria. Collectively, they produce around 60% of the electricity in the country through a coal-fired, a nuclear, and a network of hydropower plants

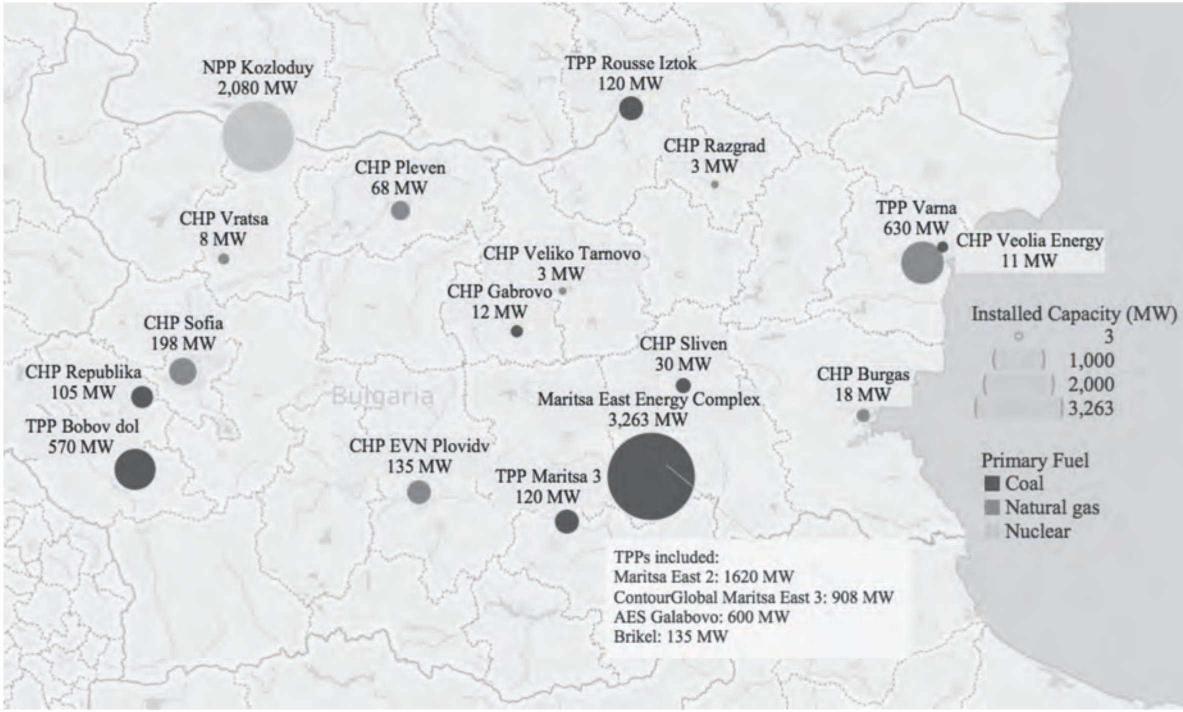

Figure 3.2 Map of thermal-based power plants.

Note: Fuel type (color) and installed capacity in MW (size of bubble). Map excludes auto-producer power plants.

Source: Author's representation based on data from Electricity System Operator, ESO (2020) and EEA (2019).

Table 3.1 Number of jobs in the Maritsa East Energy Complex

Mines	11 300
Power plants	3 200
Total direct jobs	14 500
Total indirect jobs (e.g. transport, maintenance, supply chain, etc.)	29 120

Source: Own calculations based on Vladimirov, Galev, and Primova (2020); AOBE (2020); TPP Maritsa East 2 (2019).

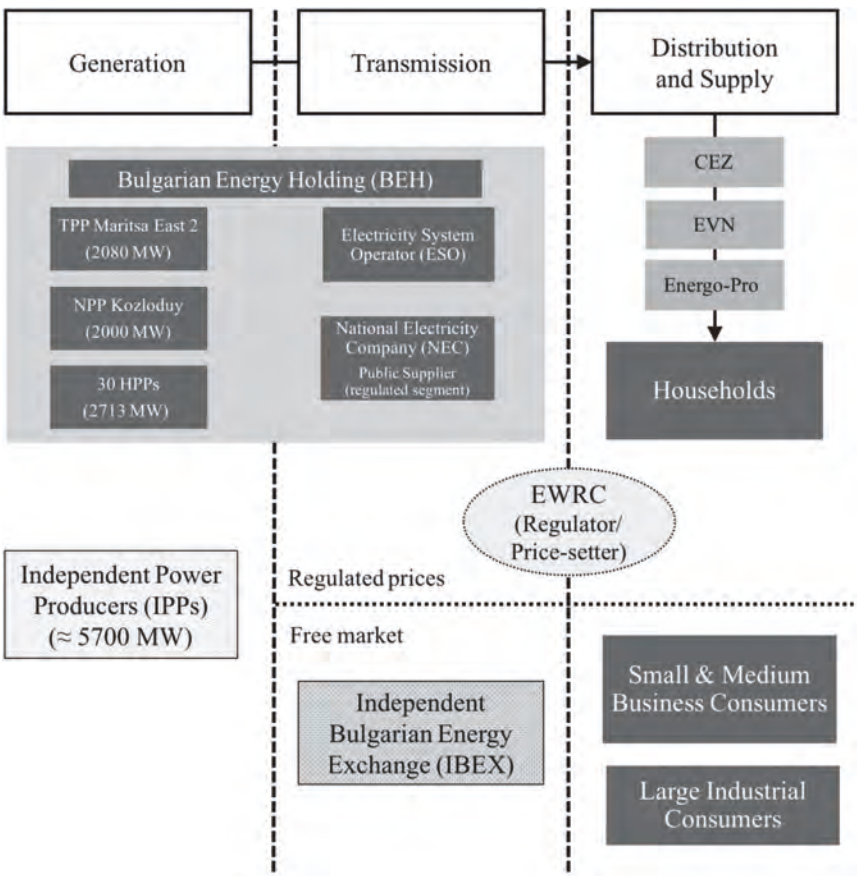

Figure 3.3 High-level structure of the Bulgarian electricity market.
Note: Amounts in MWs denote approximate installed capacity.
Source: Adapted from Ivanov (2019).

(OECD 2019). All of the SOEs in the energy sector are part of the Bulgarian Energy Holding (BEH), which is entirely owned by the state through the Ministry of Energy (MoE). With its subsidiaries, BEH engages in electricity generation, supply, and transmission, coal mining, as well as natural gas transmission, supply and storage.

Among the few large private electricity (and district heating) producers, two names stand out prominently – Hristo Kovachki and Ahmed Dogan. Formally a consultant, Kovachki is linked to some of the mafia figures from the 1990s and today his name is associated with 10 power and district heating plants across the country (U.S. Embassy Sofia 2006; Greenpeace 2018). Ahmed Dogan, is the former chairman of Bulgaria's third-largest party, Movement for Rights and Freedoms, and while no longer in active politics remains an influential political figure in the country. In 2018, Dogan became a majority-owner of TPP Varna. The sale of the TPP has been under an investigation by the Czech authorities because of potential underselling by the energy utility CEZ Electro Bulgaria AD (CEZ), which is majority-owned by the Czech state (ACF 2021).

Political economy determinants of coal use

Based on the analysis of the interviews and the extensive secondary research, this section outlines the political economy determinants of the coal regime in Bulgaria. The analysis is organized along the four general objectives for the energy sector identified through the interviews: (1) security of supply, (2) affordability of electricity prices, (3) promotion of domestic energy industry and local actors, and (4) alignment with EU policies. The coal regime has an influence on all four objectives, as it facilitates some, such as the security of supply, while it impedes others, such as alignment with EU policies.

Security of supply

Almost all actors identified the security of supply as the single most important objective for the energy sector [s1, p6, p7, s8, p9, s11, p12, b13, p14, s18, b19, s20].[2] This is mostly driven by the lack of other proven significant reserves of primary energy, except lignite coal, and the path-dependence in policymaking that relies on established sources of energy. Historically, lignite coal has played a significant role in Bulgaria's electricity mix and is thus perceived by most governmental actors as the best-known, most reliable, and locally available energy source that can guarantee the security of supply. Several actors singled out the January 2009 Russia–Ukraine gas dispute as the external event that strengthened the importance of coal the most. Due to Bulgaria's near full dependence on Russian gas supplies via a single route, Bulgaria was one of the worst affected countries when Russia cut off its supplies over the Soyuz pipeline. The government had to ask industrial facilities to stop production, while several gas-fired district heating plants were forced to switch to low-quality oil in order to maintain the heating supply (Kovacevic 2009).

The expansion of the coal regime in Bulgaria was last promoted in 2001 when the then government signed long-term PPAs with two foreign investors for 23 and 25 years, respectively. Consequentially, a new 600 MW TPP (AES Galabovo) went into operation in 2011 in the Maritsa East Energy Complex, representing the first (and so far the only) large power plant built in the country after 1989. In addition, after a major refurbishment and life extension, the 908 MW TPP ContourGlobal Maritsa East 3 reentered into operation in 2009 under a 73% foreign ownership and with the remainder being state-owned. Jointly, the two power plants produce about 20% of the total electricity in the country and their output goes entirely to the regulated segment of the market. According to several actors, the main event that contributed to the expansion of coal capacities was the decommissioning of four nuclear units in the early 2000s, as part of an EU pre-accession agreement [p7, p9, p10, b16, b19]. The government considered lignite-fired TPPs as a viable baseload alternative that can also spur economic development in the Stara Zagora region. Furthermore, the large amount of free emission allowances that Bulgaria received under Phase II (2008–2012) of the EU ETS also made coal economically viable (Staykov 2020).

Affordable electricity prices

The artificially low prices of the electricity for households was one of the most commonly mentioned issues in the energy sector and was brought up by all types of actors [s1, p7, p10, p14, p15, b19, s20]. According to governmental actors, most citizens (and hence the electorate) perceive the state as having a social obligation to provide affordable electricity. Despite the seemingly low electricity prices, in a 2018 survey, 30% of Bulgarian households said they were unable to pay their utility bills on time – the second-highest rate in the EU (Eurostat 2020a).

According to societal actors, prices for households are kept artificially low, in order to achieve certain political objectives [s1, s8, s11, p15, s20]. In 2013, mass protests brought down the ruling government, partially because of an estimated 20% spike in electricity bills, due to a mismanaged feed-in tariff (FiT) scheme for renewables (Kantchev 2013). Political decision makers have since become warier of the public opinion on energy prices, especially prior to elections. However, instead of protecting only the most vulnerable household consumers by creating an adequate compensation scheme, the authorities suppress prices for all households through the regulated market segment. According to one governmental actor [p14], Bulgaria still does not have a strategy on tackling energy poverty because responsible parties perceive it as a "thankless job," requiring a comprehensive assessment.[3]

The affordability objective is closely interlinked to the full market liberalization, which has been continuously delayed since 2013 and now should be completed by 2025 in line with relevant EU rules (Gocheva 2020a). The impact of below-market-rate prices is evident in the indebted utilities sector that systematically fails to generate profits. In 2018, the public supplier NEC was spending, on average, 92 €/MWh for purchasing electricity, while the regulator set the household electricity price to 37 €/MWh (Stanchev 2019a). While part of the price difference is covered by a designated Electricity System Security Fund, which all final consumers on the free market pay through the so-called obligation to society fee, this is still not sufficient for NEC to recover its full costs. In the coal industry, regulated prices are not an impediment per se. For the two foreign-owned TPPs, the electricity prices do not matter, given their long-term PPAs with the government. Other coal-fired power plants are usually not included as suppliers to the regulated segment, due to the availability of cheaper generators. The exception is the state-owned TPP Maritsa East 2, which secures a market for at least some of its output through a preferential tariff it gets for supplying electricity to the regulated segment (see the next section). The plant can hardly compete on the power exchange where the average electricity price on the intraday and bilateral markets was around 48 €/MWh in 2019 (IBEX 2020). Only the variable costs of the TPP were as much, and when the fixed ones were added they rose to nearly 75 €/MWh (EWRC 2019; TPP Maritsa East 2 2020a). This makes the regulated segment vital for the existence of the state-owned TPP.

Support for domestic energy industry and local actors

While not an explicit objective for the energy sector, direct and indirect subsidies are central to the coal regime in Bulgaria and were highlighted as such by all types of actors [s1, p10, p12, p15, s17, s18, b19, s20]. Formally, governmental actors justify the financial support with the need to ensure the security of supply. Politically, subsidies have a clientelistic role that ensures electoral support for the incumbent government, while preventing workers' protests from the otherwise bankrupt state-owned TPP Maritsa East 2.

Based on the interviews and the analysis of documents, four forms of coal subsidies emerge: long-term PPAs with the two majority foreign-owned power plants in the Maritsa East Complex, payments and intracompany loans to the state-owned TPP Maritsa East 2, high-efficiency payments for combined heat and power (CHP) plants, and the so-called "cold reserve" capacity payments. In total, subsidies amount to over €450 million per annum and have been significantly rising with the increase in the price of emission allowances (Vladimirov, Galev, and Primova 2020).[4] Officially, the Bulgarian government states that it does not grant any fossil fuel subsidies or state aid (MoE and MoEW 2020). With the exception of the two PPAs, the decisions regarding the distribution and amounts of subsidies are rarely transparent. As one business actor [b19] put it: "The only thing that becomes known is who the winner is."

A broad variety of support measures are directed toward the financially distressed and state-owned TPP Maritsa East 2 [s1, p12, s17, b19, s20]. The first is a preferential tariff for supplying electricity to the regulated segment through a production quota determined by the Minister of Energy. Formally, the justification is an exceptional provision in the Energy Act, allowing the Minister to determine such quota for reasons of "reliability of the supply" (MoE 2003). The TPP can hardly compete on the power exchange and is operating, on average, at 25–35% of its maximum capacity, making the quota a vital source of revenues (TPP Maritsa East 2 2020a). As a subsidiary to BEH, TPP Maritsa East 2 also benefits from cross-subsidization, whereby the parent company shifts capital from better-performing SOEs to the financially distressed TPP in the form of intercompany loans [s1, p12, b16, s17, s18, b19, s20]. Under the scheme, BEH paid nearly €158 million for the emission allowances of the TPP in 2019 alone, which were later written as liabilities on the balance sheets, saving the TPP from being legally insolvent (Gocheva 2020c; TPP Maritsa East 2 2020a). Even with preferential tariffs and cross-subsidization, TPP Maritsa East 2 is still incurring losses and requires capital injections from the fiscal budget. In an unprecedented vote in January 2020, the opposition and the ruling party in the National Assembly passed a decision that obliged the government to take all necessary measures to prevent the closure of the state-owned plant, "regardless of the opinion of the European Commission on this issue" (National Assembly 2020). To fulfill this, the parent company BEH increased the plant's capital by over €300 million, provoking sharp criticism by both industry associations and environmental NGOs, who sent a complaint to the European Commission (EC) on the grounds of illegal state aid provision (Gocheva 2020b).

Alignment with EU policies

Alongside domestic actors, the EU plays a major role in the politics and society of Bulgaria, including in the energy sector. However, as the following subsections reveal, while domestic decision makers support the EU's decarbonization policies in words and on paper, they show resistance to their full implementation, creating bottlenecks, as well as backdoors to potential policy reversals.

Decarbonization of the energy sector

In the context of the energy sector, most actors perceive the EU as the main (external) driver of policy change [s4, p5, p6, s8, p9, p10, s11, p14, p15, s17, s18, b19, s20]. While societal actors consider the EU's influence as mostly constructive and positive, governmental ones are far more critical, especially of the EU's 2050 carbon-neutrality goal. Governmental actors raised the issue of the distributional costs of decarbonization for poorer states that also are heavily reliant on coal as their primary source of energy. What has become crucial for domestic decision makers is having a sufficient level of funding from the EU, which traditionally plays a major role in public financing and is also a vital source of political capital and rents. This way domestic decision makers can be sure that the political and social costs of a coal phase-out would not be excessively high. As one legislative actor [p10] said: "The stick is there, but the carrot is too small, especially for countries like ours."

The discourse about decarbonization in Bulgaria was almost nonexistent in the political debate until the end of 2019. Occasional reassuring statements by the Minister of Energy that the country has enough lignite coal for 60 more years and the government plans to continue relying on it effectively suppressed a public discourse from emerging (BGNES 2019). At the same time, citizen awareness on decarbonization is assumed to be low, as most people are primarily concerned with the prices of energy, rather than where it comes from.

National Energy and Climate Plan (NECP)

The exact plans of the government about the phase-out of coal are unclear. There is no designated coal phase-out or "just transition" strategy, let alone a timeline for when power plants will be decommissioned. Bulgaria's NECP for the 2021–2030 period gives first implicit indications that a coal phase-out is coming but without any details around it.[5] The NECP and its implications for the coal regime were discussed at length with all but three actors. Eight of them had participated in providing comments to the draft version or in the actual writing of the draft and final versions of the document.

The NECP was first presented in December 2019 and was made available in full to the public in February 2020 with its main authors being the MoE and the Ministry of Environment and Water (MoEW). Coal phase-out is not mentioned in the document, instead reiterating repeatedly that Bulgaria "plans to make full use of the existing potential of indigenous coal, which is sufficient to generate electricity for the next 60 years" (MoE and MoEW 2020, p. 25, p. 148, p. 209). With no further details on how this potential would be utilized, the actual projections on the development of the energy system show a diametrically opposing vision for the future of coal (see Figure 3.4).

The projections of gross electricity generation included in a separate annex document to the NECP show that a coal phase-out would start gradually after 2025. In the 2026–2030 period, a 23% reduction in the electricity generation from coal is expected, followed by another 50% reduction in the 2031–2035 period. By 2040, coal will generate only a marginal amount of electricity, likely to cover periods of extreme peak demand. The first coal-fired power units are projected to go offline by 2025 when their installed capacity is expected to drop from the current 4.3 GW to 3.4 GW. According to the projections, coal will be replaced primarily by expanding the role of nuclear power and natural gas, as well as renewables albeit to a lesser extent (see online Appendix A.3 for projected installed capacity by all main technologies).

The contradiction between the repeated identical statements on the future of coal and the energy system projections in the annex to the NECP is an illustration of the tension between the two competing political objectives of alignment with EU policies and legitimation/reelection. Having the two opposing messages on the future of coal, with one being more hidden and the other very prominent, gives political actors flexibility to use one or the other, depending on the setting (i.e., at home vs. in Brussels). The contradiction also

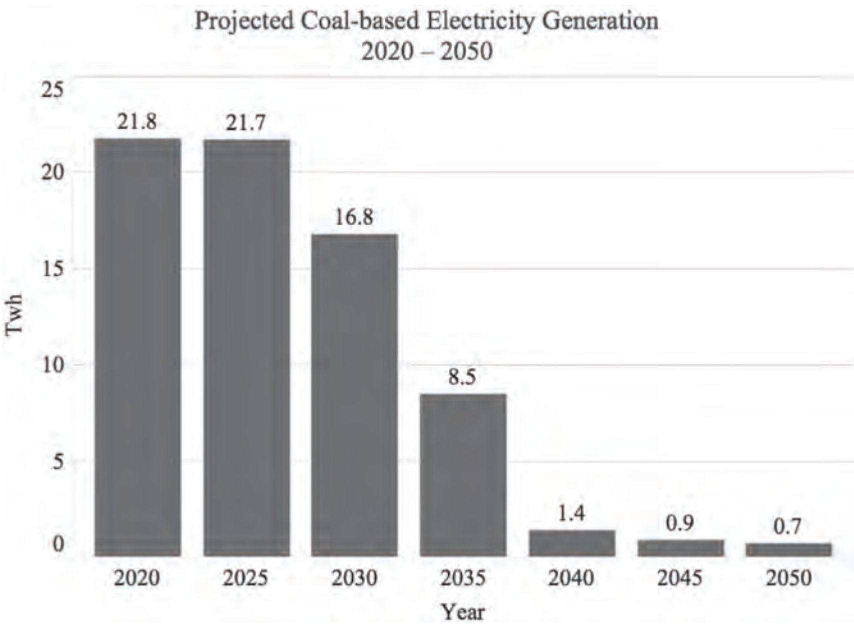

Figure 3.4 Projected Coal-based electricity generation (2020–2050).

Source: Author's representation based on data from annex document to the NECP (MoE 2020).

reveals the lack of consensus among domestic actors on the path the country would follow and discredits the NECP as a non-political document. This is evident also by the statements of public officials. When the NECP was presented by the Minister of Energy, she emphasized that the plan guarantees the long-term future of Bulgaria's coal-fired power plants until 2030 and only after that year a gradual phase-out will start, contradicting the projections (MoE and MoEW 2020). In a meeting with trade unions, the Minister was quoted as saying the year 2050 as a potential date for phasing out coal-fired power plants (KNSB 2020). Actors explain the continuous delay of a coal phase-out announcement with the government's fear of political backlash before key 2021 parliamentary elections [p7, p9, p10, p12, s17, b19, s20].

Trade unions were identified as the actor group with the highest bargaining power in the coal industry [s1, s2, s4, s8, p10, b14, p15, s17, s20]. Their large and concentrated membership base in the state-owned TPP Maritsa East 2 and in the mining company allows them to mobilize quickly and in large numbers.[6] According to one union representative, 2035 is a "realistic and acceptable" phase-out year for the state-owned TPP Maritsa East 2. However, numerous other actors, including governmental ones, spoke of the scenario that the TPP becomes the first one to close in 2025 or prior, due to its poor financial state and the rising prices of emission allowances [p1, p10, p15, b19, s20]. Furthermore, from an economic perspective, the TPP is considered a low-hanging fruit, given that the plant is fully state-owned and is not part of a long-term PPA. However, from a political perspective, closing the state-owned TPP first would be far costlier, given the high staff numbers and the strong role of trade unions.

EU mechanisms

While domestic decision makers reassure coal communities that there is no deadline for the phase-out of coal, most actors expressed certainty that EU mechanisms will force at least some of Bulgaria's coal capacity to cease operations on economic and environmental grounds [p1, s4, p6, s8, p10, s11, p12, p14, s18, b19, s20].

Due to the increase in prices of emission allowances (from €6 per tonne/ CO_2 in 2017 to €15 in 2018 and €25 and above in 2019 and 2020) and the significant drop in the amount of free allowances under the EU ETS Phase III, the variable costs of the coal-fired power plants have increased dramatically, making it harder for them to compete on the power exchange (IBEX 2020). Consequentially, the state-owned and biggest TPP, Maritsa East 2, has worked, on average, at 30–40% and at 25% of its total installed capacity in 2019 and 2020, respectively (TPP Maritsa East 2 2020b, p. 2). Despite the decreased utilization and increasing costs, the TPP maintained a workforce of nearly 2 400 people and allocated nearly €2.8 million of its 2019 budget to the sponsorship of a local football club (TPP Maritsa East 2 2019; Popova 2019). By contrast, several of the privately-owned plants linked to Hristo Kovachki have tried switching to refuse-dervived and biomass fuels in an effort to reduce their carbon emissions (Stanchev 2019b).

Further, the 2019 Regulation on the internal market for electricity was identified by actors as the mechanism of most serious future concern [s1, p6, p14, b19, s20]. According to the Regulation, from 1st of July 2025 onward, all of Bulgaria's existing fossil-fuelled power plants that emit more than 550 grams of CO_2/kWh would no longer be eligible to receive subsidies to remain on standby in case of peak demand for electricity (European Parliament 2019). In the interim time, authorities can still make such payments but only after receiving permission from the EC and organizing an auction-based capacity allocation mechanism.[7] According to governmental and societal actors, none of Bulgaria's coal-fired power plants can meet the 550-gram threshold without carbon capture and storage technology [s8, p14, s20].

Discussion and conclusion

The analysis of the four main objectives for the energy sector showed that three of them reinforce the coal regime. Viewed by political decision makers as the only reliable and locally available primary source of energy, coal plays a critical role in guaranteeing the security of the energy supply. In addition, the regulated segment has been an enabler for the state-owned TPP Maritsa East 2 to secure a market for at least some of its output. Furthermore, the synergy between the affordability and security of supply dimensions has been used as justification for the subsidies schemes that have given rise to clientelism in the state-owned plant and mining company.

Behind the coal regime stands a strong core alliance of incumbent players which includes the state, political decision makers from both the opposition and ruling parties, trade unions, and influential private actors. Contextually, the double function of the MoE as a government institution in charge of energy sector governance, but also one exercising ownership rights over BEH and its coal assets are leading to extremely high degree of politicization of energy policy decisions. Government policies become guided by favoritism for the SOEs, which help maintain the strong role of the coal regime and impede the energy transition. The findings suggest that the only viable way for a policy change to occur is through external pressures. As other cases have shown, regime destabilization takes place when more and more external pressures align (Brauers, Herpich, and Oei 2018; Leipprand and Flachsland 2018).

The biggest external pressure comes from the EU's decarbonization policies. While domestic decision makers have been shielding the coal industry from the negative impacts of more stringent EU standards by obtaining derogations or channeling subsidies, these are only short-term measures. The increasing price of emission allowances and the lack of staff optimization have already led to soaring economic losses and low utilization of the state-owned TPP Maritsa East 2, making it harder to justify the ever-increasing subsides without any reforms. Furthermore, the EU regulation on the internal market for electricity would make coal-fired power plants no longer eligible to receive payments for being on standby in case of peak demand after 2025. By the same year, plants would also become fully exposed to the free market competition, as the regulated segment gives way to the full market liberalization.

For domestic decision makers, the EU's carbon neutrality goal presents a difficult balancing act. On the one hand, adopting and implementing relevant EU policies is a high-level political priority. On the other hand, catering to the demands of the electorate for secure employment and affordable electricity prices translate to continuous delay and partial policy implementation. However, the delay of structural reforms could have high social costs, jeopardizing the "just" aspect of the impending transition. A viable way out for domestic decision makers is to have access to more EU funds that can be used as a reassurance to the electorate, but also likely as rents for firms close to the incumbent government.

The high allocation of funds to Bulgaria under the EU's 2021–2027 budget, combined with the market pressure on coal, has led to a notable change and Bulgaria has started preparing for the coal phase-out albeit without a defined timeline. While the government still has not announced any coal phase-out plans, territorial just transition plans on the regional level have been in preparation since the beginning of 2021. The plans are required by the European Commission to unlock funding from the EU's dedicated Just Transition Fund. In that process, even trade unions have started suggesting ideas, including the construction of an industrial solar photovoltaic plant on the premises of decommissioned mines with the participation and share ownership by former coal workers. Thus, despite all odds, Bulgarian coal regions have received a chance to plan more adequately their post-coal future.

Acknowledgments

I would like to thank all interviewees, who remain anonymous in this study, for taking the time to share their knowledge and opinions on the energy sector and the coal regime in Bulgaria.

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Appendix

This chapter contains supplementary online material at www.mcc-berlin.net/pecoal/ch03.

Notes

1 A representative of one of the biggest foreign-owned coal-fired power plants in Bulgaria provided a written response instead.

2 To anonymize the identities of the interviewees, each interview session was assigned a number from 1 to 20 using Google's random number generator. The letter preceding the number refers to the actor type (s – social; p – political; b – business). The cited numbers for the interviews do not correspond to the order in which the interviews are listed in online Appendix A.2, so that statements cannot be linked back to a specific interviewee.

3 As part of Directive 2019/944 on the internal market for electricity, the Bulgarian authorities have indicated that a mechanism for the protection of vulnerable electricity customers will be put in place by 2025 when the full market electricity liberalization should be completed (EC 2020b).

4 The figure includes only reoccurring transfers and not one-time-only transfers, such as capital injections and ministerial decrees.

5 The plan is required by the EC from all Member States to ensure the EU meets its energy and climate 2030 targets (EC 2020a).

6 Throughout the years, protests and threats for such by coal miners and workers have been a way to keep the government in check and ensure its continued financial support for the SOEs (Nova, 2020).

7 As of May 2021, Bulgaria is still in discussions with the EC over the new capacity mechanism.

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4 Positioned for consensus

Market-based approaches, civil society and the role of the state in Chile's coal phase-out

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Introduction

In a carbon-constrained world, coal needs to be phased out quickly and replaced with renewable energy sources (Rogelj et al., 2018). In 2019, Chile's President Sebastian Piñera announced a plan to close all coal-fired power plants by 2040, beginning with the early retirement of eight plants by 2024. This is an ambitious coal phase-out target, given that coal accounts for 35% of the country's electricity generation (CNE, 2020). Although this coal retirement scheme only applies to the four companies that currently own coal-fired generation assets in Chile, pending legislation in Congress aims to expand its reach to all energy companies and expedite the timeline for phase-out to 2025 (Bnamericas, 2020a). As a nation with minimal fossil fuel reserves and high renewable energy potential, Chile appears to be well-positioned for a quick and uncomplicated transition away from coal. However, our research finds that this agreement is far from a foregone conclusion and required decades of regulatory refinement, pressure from civil society and an expansion in the role of the state.

Our case study draws on 26 semi-structured interviews conducted in Santiago or virtually between January and December 2020. Interviewees were selected to achieve a balance of policymakers, societal actors and private economic actors. We analyzed qualitative information from interviews using the AOC (actors, objectives, context) framework by Jakob et al. (2020) covered in Chapter 1. The framework serves as a flexible means of examining the political economy underpinning policy formulation. It contends that policy formation is driven by various actors who have unique objectives and different levels of influence on the policy formation process. Policy outcomes reflect actors' objectives based on relative influence and contextual factors. After coding these interviews for relevant objectives and context, we triangulated the narratives that emerged along with secondary data and follow-up interviews to confirm the narratives we present below.

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To the best of our knowledge, there is no existing systematic understanding of how domestic and international interests and stakeholders influenced the development of coal phase-out in Chile. Our research adds nuance to the work of Florez-Fernández (2020), who finds Chile's energy transition to be a passive revolution reflecting the maintenance of technocratic power relations. Rather, our research aligns with the findings of Allain and Madariaga (2020), who document how traditional energy objectives have been reenvisioned by typically subordinated actors to garner broad support in favor of decarbonization. Our work also leans on the analysis of Alvial-Palavicino and Opazo-Bunsterac (2018), who chronicled the development of Energy 2050, Chile's long-term energy plan, and found an emphasis on building legitimacy and consensus between government, industry, academia and NGOs. This chapter largely confirms these findings on the alignment of actors, while focusing specifically within the context of Chile's coal retirement scheme.

This chapter is structured as follows: the "Background" section provides an overview of the historical and political underpinnings of the current energy policy regime. The "Findings/explanatory narratives" section presents the results of the analysis, outlining the actors' objectives that have defined Chile's transition to coal and its coal phase-out: affordability, energy security, improved air quality and decarbonization. Finally, the "Discussion and conclusions" section discusses crosscutting factors that have enabled Chile's transition and draw final conclusions.

Background

Historical and policy context

In the 1970s and 1980s, economists educated at the University of Chicago under Milton Friedman laid the foundation for Chile's economic policy during the authoritarian Pinochet regime (Tecklin et al., 2011). Market-oriented ideology is reflected in the Chilean constitution, which describes the primary role of government as supporting competition in the market (Constitution of the Republic of Chile, 1980). Some credit this ideology for the "Chilean Miracle," a period of economic growth from 1987 to 1998 during which per capita income grew by 88% (Friedman, 1992). Alongside this economic growth, energy demand grew by over 200% in the same 11-year period, while it had grown only slightly more than 60% in the previous 13 years. This economic growth relied on energy-intensive, extractive industries such as mining, which in 2015 accounted for 20% of Chile's GDP and 37% of the nation's electricity use (IEA, 2018; MoE, 2016).

Chile was the first country to enact comprehensive electric sector reform in 1982, unbundling and later privatizing state energy companies and creating separate markets for generation, transmission and distribution. In the 1990s with the reestablishment of democratic rule, the new democratic governments avoided radical economic reforms that could upset Chile's economic stability

Table 4.1 Key policies in Chile's electricity sector

Electricity market policy	*Year enacted*	*Description*
Long-Term Contract Auction Regulations	2005	Ended electricity price setting by National Commission of Energy and move to contracts that provide more price certainty for generators
Non-Conventional Renewable Energy Law No. 20.257	2008	Renewable portfolio standard of 5% between 2010 and 2014, increasing annually to reach 10% by 2014. Noncompliance was fined 42$/MWh
Non-Conventional Renewable Energy Law No. 20.698	2013	Renewable portfolio standard of 12% by 2020, 18% by 2024 and 20% by 2025
Auction Reform Regulation	2015	Created three time blocks, improving competition for variable energy resources
Transmission Law No. 20.936	2016	Created National Electricity Coordinator (CEN) to serve as independent system operator. Charged government with long-term energy planning. Shifts distribution costs from generators to consumers. Unified the grid

Source: Bustos-Salvagno (2019), Bustamante et al. (2016), Bersalli (2019).

or the elite who had mostly supported Pinochet's military regime (Barandiaran, 2016). Although government intervention increased, privatization and free market reforms were upheld (Solimano, 2012). Policymaking processes have largely remained stable, characterized by centralization, technocratic rule and strong executive authority. Key electricity policies are listed in Table 4.1.

Energy generation landscape

In the late 1990s, the traditionally hydropower-reliant nation expanded its fossil fuel generation (Furnaro, 2019). A severe drought, regulatory missteps and an incomplete energy market spurred an energy crisis in 1998–1999 (Madariaga & Allain, 2018; Murillo & Foulon, 2006). The energy deficit reached 7.6% at the height of the crisis and customers faced rationing and blackouts.

In the aftermath of the drought, natural gas imports from Argentina became increasingly important to Chile's energy mix. However, Argentina restricted natural gas exports to Chile in the early 2000s, prompting another crisis and once again revealing the fragility of Chile's energy sector. When the crisis began, Argentinian natural gas was slated to fuel 35% of Chile's installed power generation capacity (Chávez-Rodríguez et al., 2017). While the sudden curtailment of gas did not lead to blackouts, the crisis raised energy prices and sent generators scrambling for new energy sources. Chile's share of coal-fired power more than doubled over a decade, rising from 18% in 2006 to 41% in 2016 (Nasirov et al., 2020).

Despite significant coal reserves in the south, high exploitation costs and poor-quality coal limit Chile's domestic coal production. In 2019, Chile's domestic production of coal accounted for 12% of its coal supply, and its natural gas production accounted for less than one-quarter (EIA, 2021). Imported coal from Colombia, Australia and the United States has been instrumental in securing Chile's energy supply over the past decade (IEA, 2018).

Findings/explanatory narratives

Chile's decision to phase out coal-fired power generation is undergirded by decades of context that has helped to shape the objectives of key actors and bring them into alignment. Each of the following narratives describes an objective held by key political and societal actors and how it has contributed to the rise of renewable energy and the subsequent decision to phase out coal.

Affordable electricity and a competitive market

While cheap electricity is important for Chile's extractive economy, affordability among residential consumers is a key issue. Chile has one of the highest electricity prices in Latin America for residential users. Prices are an important "kitchen table" issue that the government is pressured to address, especially given the nation's energy poverty rate of 15%, defined both as perceptions of poverty or as energy expenditure as a percentage of income (Villalobos et al., 2021). Affordability has become critical in the wake of the social upheaval in 2019 that focused on economic inequality; in the immediate aftermath of the protests, the government canceled a planned 9.2% rate hike [bn1, bn2, bn3, bn5, pn1, pn8, pn9, si1, sn4] (Bnamericas, 2019; Global Petrol Prices, 2021). Affordable electricity is a key priority for both residential and commercial consumers, but residential consumers pay more at USD $0.195/kWh as opposed to the commercial rate of $0.147/kWh (Global Petrol Prices, 2021). In the pursuit of electricity affordability, the Ministry of Energy and Government of Chile (GoC) has supported the introduction of electricity auction reforms to enable greater competition from cheap wind and solar.

The role of competition

Because the GoC is committed to market nonintervention, originating from constitutional limitations to state activity, competition emerges as an objective of its own. This is reflected in the role of the government in the electricity sector, where it serves to "develop a model to promote the energy transition based on the market" without the use of subsidies [sn4]. The government sees competitive markets as the means to securing lowering prices and attracting international investment [bn3, bn4, bn5, pn5, pn7, pn8, pn9 sn4]. Hence, the

Ministry of Energy supported long-term contract (LTC) auctions for the energy sector in 2005, allowing generation companies to compete with one another.

Promoting renewables through legislation

Despite efforts for LTCs to allow new entrants to compete, renewables still struggled to significantly reshape Chile's carbon-intensive generation profile (Bustos-Salvagno, 2019). Some members of a technical-parliamentary citizen commission for sustainable development believed that high-electricity prices reflected high market concentration and a model that privileged fossil fuel generators (Pacheco, 2018, 88). Renewable energy costs, especially global solar costs, had dropped significantly in recent years, and the electricity regulator expected that renewable technologies would handily outbid competitors and reduce electricity prices [bn4, pn8]. Indeed, although initial technical analyses suggested that utility-scale PV solar would cost approximately $100 per MWh by 2020, currently Chile's solar projects are some of the cheapest in the world, with a levelized cost of energy at less than $30 per MWh, well below $77–167 per MWh for coal plants (Bloomberg NEF, 2020; Timilsina, 2020; Tringas, 2011).

Despite these low costs, renewable technologies did not initially win many tenders, because the auction design did not allow for the flexibility that renewables required, and electricity prices remained stubbornly high (Flores-Fernández, 2020). To address these designs' weaknesses, auctions were reformed in 2015 to shift to three time blocks, increasing flexibility and, thus, competition in the electricity market (Bustos-Salvagno, 2019). These efforts to improve competition led to the number of auction participants increasing from only 1 in 2012 to 84 participants in 2016 (Bersalli, 2019, 9–10). Subsequently, electricity generation prices decreased by 75% from 2012 to 2017 from around $130 to $30 per MWh (IEA, 2018, 94).

Likewise, the Transmission Law of 2016 (Law No. 20.936) specifically sought to level the playing field for renewables. By unifying the country's two main grids and transferring transmission costs to consumers, the law enabled the connection of demand centers with regions of high renewable potential (Bustamante et al., 2016). The law also created a tender system for complementary services needed with higher degrees of variable renewable energy (IEA, 2018).

The focus of Chile's government on achieving affordability through competition has resulted in greater penetration of renewables into the market. As of 2019, 21.8% of installed capacity in Chile was non-conventional renewable energy (NCRE), with 10.7% solar and 6.7% wind (Bersalli, 2019). In terms of electricity production, wind and solar produced 0.77% of Chile's electricity in 2013 and rose to 14.3% in 2019 (Enerdata, 2020). As renewables are not subsidized, this makes Chile one of the first nations to see renewable energy directly compete with conventional energy sources in price-based auctions (Ellis et al., 2019).

Energy security

Affordability and security are closely linked energy objectives in Chile. Together, they form the first pillar of the government's long-term sectoral strategy, Energy 2050, but historically these objectives have been in conflict. The focus on low-cost generation in Chile's regulatory environment created a fragile energy system that did not consistently favor diversification [sn8]. Primary energy sources were disrupted in turn by energy crises, resulting in electricity shortages and price increases that were poorly received by the public (Agostini et al., 2017). The political fallout from these crises motivated the government to take a more active role in balancing affordability and security concerns.

Energy crises

Chile's two major energy crises increased the political salience of energy policy and expanded the government's functions in this sector. The first month of the 1998–1999 energy crisis saw daily coverage by Chile's two largest newspapers. By May 1999, 24% of Chileans named the electricity shortages as the main problem facing the country (Murillo & Foulon, 2006). An inquiry found the government and energy companies at fault, and the president's approval rating dropped as demonstrators took to the streets (Stern, 1999).

The geopolitical nature of the Argentinian natural gas crisis reinforced the importance of developing domestic energy resources for many stakeholders. For societal groups, it showed "that the state had no realistic projection about the challenges of energy policy" [sn8]. The Ministry of Economy saw energy independence as a way to reduce foreign currency expenditures on imported fossil fuels [sn2]. Securing domestic energy supply also promoted economic development, another important political objective [bn2, bn3, bn4, bn5, pn8]. In 2016, the government's approach to energy security included increased fossil fuel extraction, despite a lack of concomitant policies to encourage fossil fuel development (MoE, 2016). However, given Chile's significant renewable energy potential, a focus on energy security supported a shift toward renewables, a link that environmental organizations leveraged in their advocacy [sn8] (Madariaga & Allain, 2018).

An expanded role for the state

In the wake of these crises, there was an increasing sense that the government needed to be more proactive in directing energy policy, going beyond the constrained regulatory role described in the section on affordable electricity above. The market, as constructed, had experienced high-profile failures to secure sufficient energy supply, highlighting the need for generation diversification and long-term planning.

The passage of the first NCRE law aimed to increase domestic energy production through a renewable portfolio standard. This first entry into renewable energy policymaking reflected an objective of energy security rather than decarbonization, allowing generators to pay a fee in lieu of compliance (Allain & Madariaga, 2020). Ultimately, the impact of this law on diversifying generation was limited until the auction reforms described in the "Power sector overview" section took place.

High electricity prices stemming from supply shortages risked hampering economic development. In the aftermath of the natural gas crisis, the Ministry of Energy emerged as a key actor in conducting long-term planning to prevent future energy crises (Pacheco, 2018). The Ministry developed a more democratic vision for the energy sector through the Energy 2050 strategy. The participatory planning process for Energy 2050 also represented an unprecedented approach to policymaking in Chile, moving beyond cozy relationships with sectoral stakeholders and engaging with the wider public [sn3, sn8].

However, growth in the renewable energy sector also creates energy security challenges. Energy-intensive and economically important industries, such as mining, are concerned about intermittent resources and shouldering the cost of transmission and storage upgrades [bn1]. Incorporating renewable resources, along with the requisite storage, transmission and flexibility, is one of the sector's central upcoming regulatory challenges [bn2, bn4, pn8, si1]. The pursuit of energy security catalyzed early clean energy policy, but a broader mix of objectives explains Chile's current decarbonization efforts explored in the following sections.

Air quality

Chilean energy policy has long revolved around the twin objectives of affordability and energy security, reflecting the main concerns of the government and private sector actors. However, as the influence of civil society increased and the Ministry of Energy became more active in long-term energy planning, the sector rebalanced around a broader array of objectives. Social objectives are increasingly reflected in executive actions, judicial rulings and energy planning. Air pollution has historically been seen as the main environmental challenge by citizens, and protests against coal plants have been instrumental in changing the public perception and economics of coal generation [bn4].

Chile faces notoriously bad air quality with over 8 million inhabitants exposed to air pollutants above statutory limits between 2015 and 2017 (Lizama & Figueroa Serrano, 2018). Air pollution is largely attributed to woodsmoke, vehicle exhaust, industry and, in some places, coal power plants, magnified by topographical and meteorological conditions (Díaz-Robles et al., 2011). Certain areas with highly concentrated air pollution from coal plants and industry are deemed "sacrifice zones" and inhabitants face elevated risks of cancer and lead poisoning linked to chemicals found in coal ash deposits (Tapia-Gatica et al., 2020). Though industrial air pollution has been trending downwards, spills and toxic air pollution events in sacrifice zones gained media coverage, drawing political attention to the human costs of air pollution and creating a strong rhetorical argument against coal plants [bn2, pn6, pn7, pn10, sn5] (Greenpeace, 2021). As one interviewee stated,

> When we had the emanations, the toxic effects in Quintero-Puchuncaví, that was something that also awakened, that I believe contributed to the feeling of abuse, right? To the feeling of inequality in our society, of inequities, of lack of environmental justice, of having territories that receive pollution, that receive the waste in an inequitable and unequal way. [sn7]

Social participation and movements

Protests against coal power plants brought local concerns about air pollution to the national stage, and the movements turned out thousands of protestors in Santiago, project sites and nationwide. Barrancones, a proposed coal plant sited near ecological preserves, was approved by environmental authorities in 2010. The project developer ultimately decided to cancel the project after then-president Sebastian Piñera, pressured by large protests, requested the project site to be moved (Agostini et al., 2017). Environmentalists and the general public criticized Piñera's action despite generally agreeing with the outcome. Instead of strengthening the institutional framework for stronger environmental protection, Piñera relied on his close ties with the private sector to intervene in the unpopular development [pn5]. Citizens found fault with this process, demanding stronger institutions and structural changes to prevent such projects from being developed in the future and isolate decisions on development from the will of the authorities (Cordero Vega, 2010).

Environmental protests were not confined to coal plants either. In 2011, 80,000 people in Santiago took to the streets to protest against a proposed large hydro project in the southern region of Aysén, HidroAysén (Agostini et al., 2017). Activist networks mobilized protests in cities throughout the county, in one of the largest mass demonstrations in recent history [sn3]. Energy-intensive, extractive industries seen as necessitating the project also drew the ire of protestors [bn1]. Protests have also stalled transmission projects, despite being linked to increasing renewables (Azzopardi, 2018). A 2012 article estimates $22 billion of energy investment was suspended at a time when energy demand was growing rapidly (Reuters, 2012).

The second Bachelet administration recognized the need to socially validate the nation's energy strategy through broad participation to mitigate social conflict [sn7] (Alvial-Palavicino & Opazo-Bunster, 2018). Activists and protestors shuttered energy projects through social movements and helped catalyze the inclusion of more established environmental NGOs in the government's social participation efforts. (Castiglioni & Kaltwasser, 2016; Ureta, 2017).

Judicialization and environmental regulations

Environmental organizations also became effective plaintiffs in an increasing number of lawsuits against coal projects. The Chilean Supreme Court revoked permits for Central Castilla, a proposed coal plant in 2012, saying that the project would "harm the constitutional guarantee that one can live in an environment free of pollution" (Reuters, 2012). Other projects were fined or temporarily suspended after local groups sued. In 2015, a plan for the Punta Alcalde coal plant was abandoned after long-fought permit battles and judicial rulings established strict monitoring protocols (Reuters, 2015). The court rulings not only impacted private companies but also extended to the government, ruling that agencies were responsible for coordinating to prevent air pollution and other types of environmental degradation [sn7] (Linazasoro Espinoza, 2020).

Chile's 2010 entry into the OECD and free trade agreements required stricter environmental regulations (Carrasco & Maillet, 2019; Madariaga, 2019). In 2012, the Ministry of Environment introduced tighter air quality standards, which increased the cost of coal generation. The second Bachelet government also imposed a tax on carbon and local air pollution in 2014, taxing emissions from boilers or turbines exceeding 50 MW. While the tax is generally seen as insufficient to significantly reduce emissions, it sent an important political signal to generators [pn1, pn10] (Mardones & Flores, 2017).

Decarbonization

Rising awareness of climate change

With the emergence of climate change as an issue of popular interest – driven by domestic concerns and attention around hosting the UN Climate Change Conference, COP25 – decarbonization represents another key objective for the GoC and the Ministry of Energy. The Ministry of Energy has faced limited resistance to the Voluntary Coal Retirement Scheme, largely due to alignment with the first three key objectives: the pursuit of affordable and secure energy brought about changes to the electricity market that supported renewables and judicial rulings in response to civil society made coal-fired power development more challenging and expensive.

In the past, international NGOs in Chile have focused on air quality and environmental degradation. However, recent polling data from 2015 shows that 77% of Chileans believe that "climate change is a very serious problem," which has reflected an uptick in concern over the impacts of climate change [pn1, pn3, pn5, pn6, pn7, pn9, si1, sn5] (Pew Research, 2015). In more recent polling, Chileans ranked the "environment" as the fourth most important challenge for the country (Ministry of Environment, 2018). The growing public awareness of climate change seems instigated by international efforts, which "took on a little more strength" since COP21 [bn1, sn5]. Chile's role in initially hosting COP25 and the popularity of Greta Thunberg were cited for driving popular awareness of the climate crisis [pn1, pn3]. Increasing public engagement with climate issues intensified pressure on the Chilean government to take action.

Increased public concern is mirrored in the activities of the international NGOs, which, along with national organizations like Chile Sustentable, form the core of civil society activism in Chile. In the past, they have focused on the protection of the local environment, like opposing the HidroAysén hydroelectric project, but this has changed more recently as concerns about air quality were leveraged in the lead up to COP25 to criticize Piñera's decarbonization plan [pn5] (Greenpeace, 2019). It is not clear whether the increased emphasis on climate change by NGOs, like the WWF and Greenpeace, reflects popular awareness in Chile or a prioritization of the international objectives of these organizations. Evidence from interviews suggests that WWF Chile's objectives adhere to the agenda of its parent organization but are also largely responsive to Chile's environmental priorities [sn2].

Impact of international pressure

The GoC has also faced international pressure to decarbonize, namely from its ratification of the Paris Agreement in 2017 and its plan to host COP25 [bn4, pn8, si1, sn4, sn5]. In its Nationally Determined Contribution (NDC), Chile committed to a GHG emission budget not exceeding 123 MtCO2eq by 2030. As of 2020, Chile has deepened this commitment by limiting the budget to 95 MtCO2eq by 2030 (GoC, 2020). In the 2020 update to Chile's NDCs, the GoC identifies coal plants specifically as the main challenge for compliance: "The Energy Sector (related to fossil fuels consumption) is responsible for most GHG emissions nationwide, accounting for 78% of total emissions in 2016, primarily due to the use of mineral coal for electricity generation and diesel for terrestrial transportation" (GoC, 2020).

In January 2018, an agreement was signed to restrict further construction of coal-fired power plants and complete phase-out by 2050. The incoming center-right Piñera II government established a discussion table ("decarbonization table") comprising all main actors of industry, including owners of coal assets, which reached a voluntary agreement to eliminate all coal generation by 2040 and retire 8 of Chile's 28 coal plants by 2024. This concluded in time for COP25, presenting an opportunity to demonstrate Chile's leadership on climate action at an international climate conference. As the initial host of COP25 (before it was moved to Spain due to social unrest), Chile faced pressure from international NGOs to take bold action on climate issues [pn8, si1]. Chile wanted to be "an example to the world of how things are being done" [si1].

Although the timing of the agreement coincided with the climate talks, the agreement itself represented the objectives of the Ministry of Environment as well as energy companies. At COP23 in 2017, Marcelo Mena, then Minister of Environment, was introduced to the Powering Past Coal Alliance (PPCA), a "coalition of national and sub-national governments, businesses and organizations working to advance the transition from unabated coal power generation to clean energy" [sn3] (PPCA, n.d.). Minister Mena wanted Chile to join the alliance, but the group Business Leaders for Climate Action (CLG-Chile) told Mena that Chile was "not in a position to sign this as a country" [sn3]. Although Minister Mena relented and did not join the PPCA, Mena and the Minister of Energy, Andres Rebolledo, maintained pressure on the "Big Four" energy companies with coal assets to negotiate an alternative [bn4, sn3, sn5]. Eventually, the Big Four reached an agreement with the GoC, and to quote a representative from the Generadoras de Chile (Association of Chilean Power Generators):

> When the possibility of working with the government on the issue arose because it was an emerging issue at the global level, there was the Powering Past Coal Alliance. We were not going to be able to do this adequately, so what we did as an association was facilitate an agreement between the Ministry of Energy and [the Ministry of the] Environment and us and the four companies to constitute a working table.
>
> [bn4]

The plan for voluntary coal closures represented the bold action that the GoC was looking for, while accommodating a slower transition to placate generator's concerns.

Voluntary Coal Retirement Scheme

The plan required energy companies to agree that (1) there would be no new development of coal-fired power plants, (2) there would be a retirement of all coal-fired power plants, given necessary conditions and (3) there would be a working group "to define the social, economic and environmental conditions so that later the companies, bilaterally with the government, would establish the withdrawal order, with the condition that by 2040 at the latest all the coal in Chile would be withdrawn" [bn4]. There was a distinct perception during our interviews that this plan involved no subsidies for the Big Four, distinguishing it from Germany's coal policy. However, the plan does allow plants to enter a "Strategic Reserve State" (ERE) in which they receive capacity payments, for up to 60% of the value of their full capacity, for up to five years after retirement to remain operational in case of emergency [bn4, si1] (Bernal, 2020; Bnamericas, 2020a, 2020b; Gomez Agurto, 2019; Aprueba Acuerdos De Retiro De Centrales Termoelectricas a Carbon, 2020; Morawski, 2020).

Electricity generation companies in Chile were willing to quickly shift their position to coal generation for three reasons: first, they do not exclusively own coal assets; second, as multinational corporations, they have their own international climate goals; third, the Voluntary Coal Retirement Scheme may have mitigated risk in the sector. Regarding coal assets, after the passage of NCRE law, No. 20.257, the Big Four increased the percentage of renewable technologies in their portfolio. Currently, coal represents 15% of Enel's generation capacity, 21% of Colbún S.A.'s, 89% of AES Gener's and 58% of Engie's assets in Chile. This demonstrates generators' lack of commitment to maintaining coal generation facilities that are no longer profitable or competitive with other generation sources. In other words, "these are electricity producers, they are not thermoelectric [companies] by definition" [bn4].

Instead, as three of the four are multinational corporations, their attitude toward decarbonization reflects "their own headquarters or their own countries of origin" [pn7]. These corporations, because of international pressure on climate change, have decarbonization strategies that their Chilean strategy must align with. As an example, in December 2019, Engie announced the early closure of two coal units in Mejillones. In the press release, Engie described itself as "a leader in zero-carbon transition" (ENGIE, 2019). While all of Chile's coal plants are owned by these four companies, these companies own power plants that use a range of energy sources, and their multinational nature coincides with international decarbonization strategies, mitigating their resistance to shifting from coal in Chile. Companies may also have entered these negotiations with the government in 2017 for a voluntary plan in order to avoid future legislation, which was seen as riskier [bn6].

Given the government's pro-business approach and the reticence of the Ministry of Energy to lead a top-down transition, there was alignment between the GoC and the private sector wherein all actors preferred an internally negotiated agreement on coal phase-out. Rather than wait for the outcome of a nonparticipatory legislative process, the Big Four were able to negotiate a phase-out that included a potential for a 60% capacity payment if plants remained in "strategic reserve status" in case of emergencies (Bnamericas, 2020a, 2020b; Morawski, 2020).

Discussion and conclusions

The GoC's Voluntary Coal Retirement Scheme was an unprecedented and bold policy in a sector whose initial design had precluded political interference. To understand the political forces driving Chile's decarbonization efforts, we have highlighted four main objectives: (1) affordable electricity prices, (2) energy security, (3) air quality and (4) decarbonization. The MoE's interest in affordability and energy security spurred changes in market design that enabled cheap renewables to compete with fossil fuel generation. This was made possible because of declining prices for solar, globally, as well as Chile's particularly high solar potential (Bloomberg NEF, 2020). Mobilization of civil society around air pollution also jeopardized the financial viability of coal projects. However, these were necessary, but not sufficient conditions for coal phase-out. Decarbonization policy was spurred by civil society, government and citizen interest in climate change, leading to the creation of the voluntary coal phase-out agreement, which compensated companies that own coal assets to retire their plants ahead of schedule.

One key enabling factor that emerged in the narratives around decarbonization was Chile's technocratic approach to governance. Technocracy is usually defined by decision-making led by technical scientific experts. Because of this, political power "tends to gravitate towards technical elites," and science and technology become ways to legitimize decisions (Gunnell, 1982). In Chile, the government has traditionally relied on decision-making that is based on external sets of rules, criteria and models, especially in environmental policy (Barandiaran, 2016; Flores-Fernández, 2020; Simsek et al., 2019).

In particular, the Ministry of Energy has relied on models that demonstrate the technical feasibility of the energy transition, and the outputs of these models helped actors come into alignment around a set of assumptions. In other countries, increasing renewables in the energy mix raised concerns around flexibility and intermittency. However, in Chile, there is minimal pushback [bn2, bn4, pn8], since academic models and modelers in the Ministry of Energy have stated that it is technically possible to significantly increase renewable capacity and the electricity system has not yet reached the thresholds of what it can manage. Chile's technocratic orientation toward policymaking is reinforced by broad trust in these models, and support for an evidence-based, pragmatic and apolitical approach to decarbonization [bn3, bn4, pn5, pn6, pn7, si1, sn1, sn2, sn4, sn6].

However, during the second Bachelet administration (2014–2018), there was an increased emphasis on incorporating public participation into government decision-making, which has been at odds with Chile's technocratic approach. In Chile, public participation in decision-making has been framed as disruptive and unpredictable (Castiglioni & Kaltwasser, 2016; Ureta, 2017). During the Bachelet II administration, increased calls for public input led to a redrafting of the 1980 constitution, although this new constitution was never ratified (Seminario & Neaher, 2020). In the Ministry of Energy, under Maximo Pacheco, energy strategy was supposed to be "socially validated," and the new energy agenda of the Ministry called for "deeper dialogue" with communities impacted by energy projects (Ureta, 2017).

Given this recent participatory approach, we might expect a destabilization of Chile's reliance on technocratic policymaking, though the influence of public engagement in energy policy remains unclear. Environmental activists believed that public participation was a façade, and that few meaningful inputs from consulted parties were incorporated into policymaking [sn5, sn8]. This may be in part because of limits to public participation that are enshrined in the Chilean Constitution, which, as of 26 October 2020, will be redrafted by an elected, representative body. An oft-cited weakness of the current constitution, increasing public participation is a key goal among those who have called for a new constitution (Feng, 2020). The expectation from some actors has been that greater participation will increase the ambition of climate policy [pn5]. On the other hand, a competitive liberalized market, in tandem with a technocratic approach to policymaking, has avoided concentrating power in any particular energy company, which may have enabled the phase-out.

Critics have called the 2040 deadline for coal plant closures unambitious, and even government actors voiced the opinion that NCRE energy laws are "very weak" and "not a strong policy" [pn5]. However, Chile's commitment to coal phase-out is a step toward decarbonizing the electricity sector and demonstrates progress toward its goal of carbon neutrality by 2050. In order to strengthen this agreement, legislation was brought before Congress in August 2020 that would enshrine coal phase-out into law and expedite the timeline to retire coal by 2025. It would also initiate the immediate shutdown of power plants that have been in operation for more than 30 years (Bnamericas, 2020a). Even without new legislation, the coal phase-out has proceeded more quickly than promised, with Enel announcing that it would close its remaining coal plants by May 2022. At present, 17 coal-fired power plants are scheduled to operate until 2040.

In Chile's case, these steps have been made possible in great part by limited fossil fuels reserves, high renewable energy potential and exposure to international markets that make energy security a priority. These contextual factors set the stage for policies and reforms that supported inexpensive renewable energy development, which could compete with coal-fired power plants in Chile's electricity market. However, it was the rise of civil society actors in response to local air quality concerns and the increased relevance of climate change in Chile's national discourse that pushed government actors to develop an ambitious plan for coal phase-out in collaboration with energy companies. This alignment of actors and objectives facilitated action on decarbonization through coal phase-out in Chile, setting the nation on track to meet its international climate commitments.

Appendix

This chapter contains supplementary online material at www.mcc-berlin.net/pecoal/ch04.

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5 Political economy of climate and energy policies in the United Kingdom

Nora Stognief, Paula Walk, and Pao-Yu Oei

Introduction

The United Kingdom (UK) announced in 2015 that it would phase out coal power generation entirely by 2025 and has recently brought forward the date to 2024 (BEIS, 2020b; Littlecott et al., 2018; Rudd, 2015). Meanwhile, despite being the most climate-damaging energy carrier, coal is experiencing a renaissance in many other countries across the world where new coal capacities are still being built (Steckel et al., 2015). What rationales are shaping these major differences in the development of coal? In developing the AOC ('Actors, Objectives, Context') framework, covered in Chapter 1, Jakob et al. (2020) argue that climate and energy policies are influenced not only by economic or strategic factors but also by political economy factors. The UK is one of the phase-out countries, along with Chile, Germany, Bulgaria, and the United States. Insights on what political economy factors led to the UK's transition away from coal might help guide similar transitions in other countries.

In order to identify the objectives, actors, and contextual factors relevant to the UK coal phase-out in the study period 2000–2020, 22 stakeholders were interviewed between 27 May and 1 October 2020. They were mainly identified by means of a literature review and internet research. Special attention was directed to having all relevant stakeholder groups represented. We interviewed eight policymakers (p), seven researchers (r), five societal actors (s), and two business actors (b). We further applied a 'snowballing' principle, meaning that, at the end of every interview, we asked interviewees whether they could recommend further experts for us to talk to. A full list of interviewees is provided in online Appendix A.2. The cited number codes for the interviews do not correspond to the order in which the interviews are listed in the online appendix, so that statements cannot be linked back to a specific interviewee. The interviews were conducted using a semi-structured approach, following the interview guideline in online Appendix A.3. The answers were evaluated according to the AOC Framework to identify actors, context factors, and objectives that are relevant to the political economy of coal (Jakob et al., 2020). The results are intended to inform subsequent comparative analyses of different case-study countries.

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The remainder of this chapter is structured as follows. The "Country context" section gives some country context on UK energy policy and the coal phase-out process. In the "Political economy determinants of the coal phase-out" section, we present our results, namely the three main objectives we identified. We then structure the relevant contextual factors along with those objectives. The "Discussion" section then discusses the policy implications for the further energy transition in the UK as well as lessons learned relevant to other countries. The "Conclusions and outlook" section concludes.

Country context

The UK is a high-income country, a member of the G7 and the Organization for Economic Co-operation and Development (OECD), and the world's fifth largest economy by nominal GDP. It was a member of the European Union (EU) until 31 January 2020. Historically, the UK had a strong coal industry (Littlecott, 2015). Coal was the most important energy fuel until the late 1960s, when domestic coal mining had already started to decline after peaking in 1952 (Michaels, 2016). The 1984–1985 period was a major turning point as Margaret Thatcher's Conservative government announced a large number of pit closures, which led to the miner's strikes and subsequent destruction of union power (Phillips, 2014). The UK's domestic coal mining industry has remained relatively small ever since, with most of the coal used for electricity generation being sourced from abroad (Michaels, 2016). In the late 1990s, the privatization of the British electricity sector followed, which is now dominated by the so-called Big Six suppliers (British Gas, EDF Energy, E.ON UK, Npower, Scottish Power, and SSE). The government department that is responsible for energy is the Department for Business, Energy and Industrial Strategy (BEIS). Climate change is also one of the areas of responsibility of BEIS.

Following the coal phase-out announcement in 2015, the share of coal in the UK electricity mix has experienced a sharp decline (see Figure 5.1). Meanwhile, the deployment not only of wind (mainly offshore) and solar but also of natural gas has increased, accompanied by a decrease in electricity demand (BEIS, 2020c). From 2000 to 2014, coal's share varied between 27% and 39%, falling rapidly from 2015 after the coal phase-out was announced. In 2019, the share of coal in the electricity mix was at only 2% (own calculations based on BEIS, 2021a). As of 2021, there are only four coal-fired power stations left in the UK, three of which are planning to convert or shut down before 2024 (Evans, 2021).[1]

Figure 5.2 gives an overview of relevant policies and events surrounding the coal phase-out in the study period 2000–2020, as well as selected prior developments that are relevant for contextual understanding. We briefly review which policies contributed to a reduction in coal-fired power generation before the coal phase-out was officially announced in 2015.

Climate change has been an important political issue since the early 2000s. However, the first pressures on UK coal power stations were exerted not by

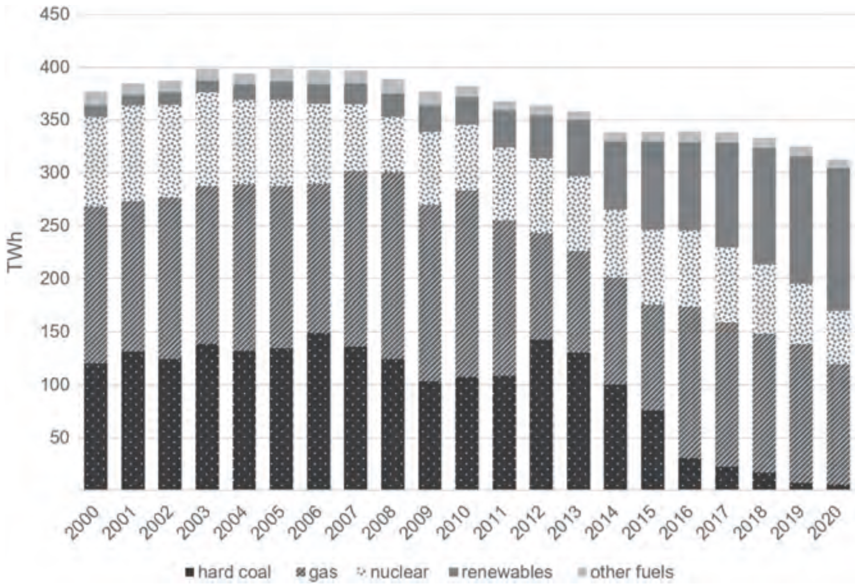

Figure 5.1 Gross electricity generation for the UK.
Source: Brauers et al. (2020) based on data from BEIS (2021a), modified.

domestic energy or climate policy but by EU air-pollution policy in the form of the Large Combustion Plant Directive (LCPD) (Isoaho & Markard, 2020). The Climate Change Act, legislated in 2008, introduced a target of 80% of greenhouse gas (GHG) emissions reduction by 2050, which put further pressure on coal. In 2013, the Electricity Market Reform (EMR) introduced most prominently the capacity market (CM) in which capacities are auctioned. Also part of the EMR was the UK carbon price floor, which was introduced as a response to the low level of the EU carbon price within the EU Emissions Trading Scheme (EU-ETS). The UK carbon price floor ensured that the price of the EU-ETS did not fall below that pre-specified level. While the floor price has not increased as high as originally planned, it has created a significant additional cost for fossil-fueled power generators (Littlecott et al., 2018). This facilitated a strong growth in the deployment of renewable energy (RE) for electricity generation and the carbon price was a major factor in shifting the economics away from coal (Grubb & Newbery, 2018). The CM, however, was still accessible to coal even after 2015 and thereby provides indirect subsidies which are estimated at an annual €138.4 million for the 2017–2020 period (van der Burg, 2017).

Isoaho and Markard (2020) point out that starting from 2013, the coal decline had already progressed to an extent that perspectives for future coal use had largely been driven out of the public discourse. This was partly because Carbon Capture and Storage (CCS) had ceased to be a viable option and was

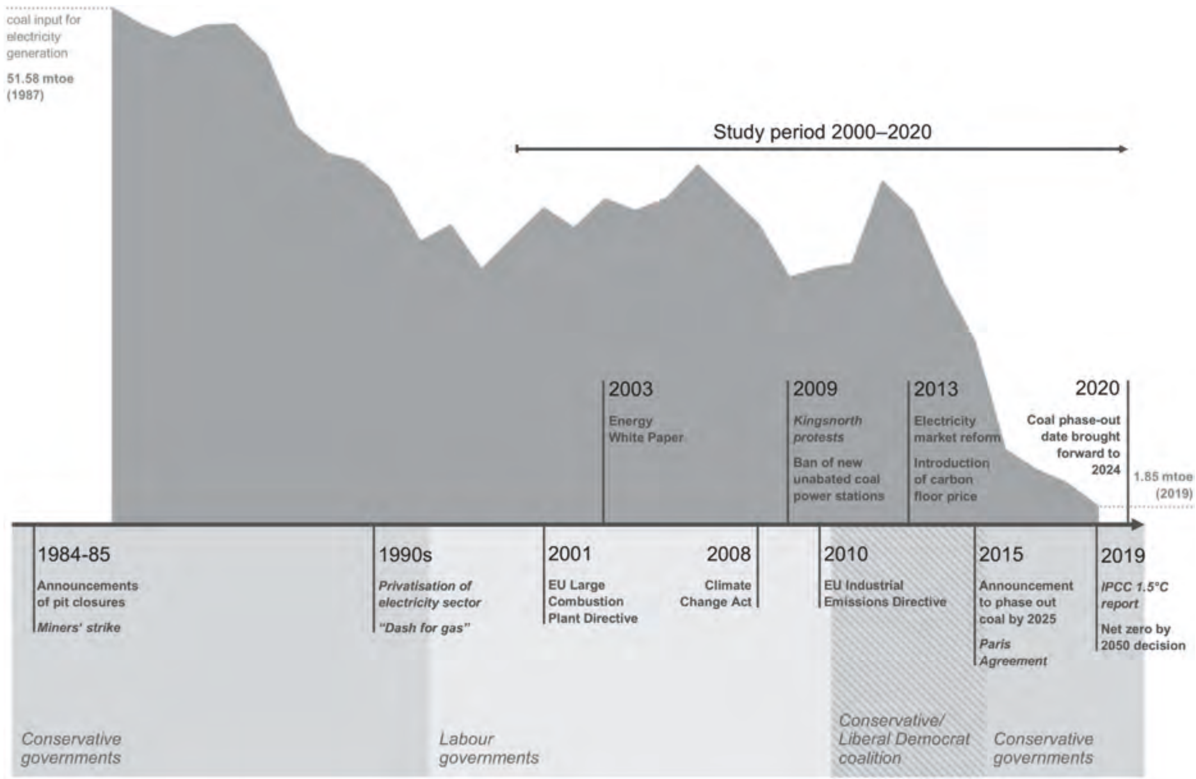

Figure 5.2 Timeline of policies and events surrounding the UK coal phase-out.
Source: Own depiction with data from BEIS (2020c).

abandoned by the government in 2015. In the run-up to the Paris Agreement that same year, the UK government officially announced that it would phase out coal by 2025.

Brauers et al. (2020) identify the following determinants for the UK coal phase-out: the liberal market economy, policies such as the carbon price floor and EU emission standards, old coal infrastructure and weakened influence of unions, increasing costs for domestic coal with simultaneous availability of domestic natural gas and advances in RE, as well as NGO campaigns. They find that the UK coal industry has employed external as well as internal strategies to cope with the increasing pressures by climate policies and regulations. External strategies include successful lobbying for the CM and a cap on the carbon price floor, the establishment of narratives surrounding rising electricity prices and the possibility of blackouts. Meanwhile, as an internal strategy, generators have increased their investments in RE and natural gas in order to be less dependent on coal. According to Geels et al. (2016), incumbent actors play a major role in the UK's low-carbon transformation pathway, as structural reasons make the deployment of RE technologies by new entrants more difficult.

Political economy determinants of the coal phase-out

The 22 interviews as well as a supporting literature review yielded the list of societal and political actors and contextual factors given in Table A5.1 in Appendix A.1. The objectives mentioned by our interviewees are summarized into three high-level objectives: (1) climate action, (2) low electricity prices and jobs in the power sector, and (3) security of supply. Each high-level objective is presented in more detail in a subsection along with relevant contextual factors.

Figure 5.3 depicts the share of interviewees in each stakeholder group (business, policymakers, researchers, and societal actors; cf. Table A5.2 in Appendix A.2) who mentioned each of the three high-level objectives (or parts thereof, cf. Table A5.1 in Appendix A.1) to have influenced energy decisions in the UK. We merely identified whether or not an objective was mentioned by each interviewee but did not count how many times it was mentioned in each of the interviews. Mentions of objectives or contextual factors cited in this chapter not only necessarily reflect the opinion of the cited interviewee but also include mentions of the aspect being the priority of other actors.

As shown in Figure 5.3, 'climate action' was the only high-level objective mentioned by all 22 interviewees, closely followed by 'low electricity prices and jobs in the power sector', which was indicated in 20 interviews. 'Security of supply' was an objective that was mentioned less by societal actors than other actor groups. It must be noted, however, that our sample of business interviews consists of only two interviews and is therefore too small to be representative. In the following, we present the three high-level objectives together with relevant contextual factors.

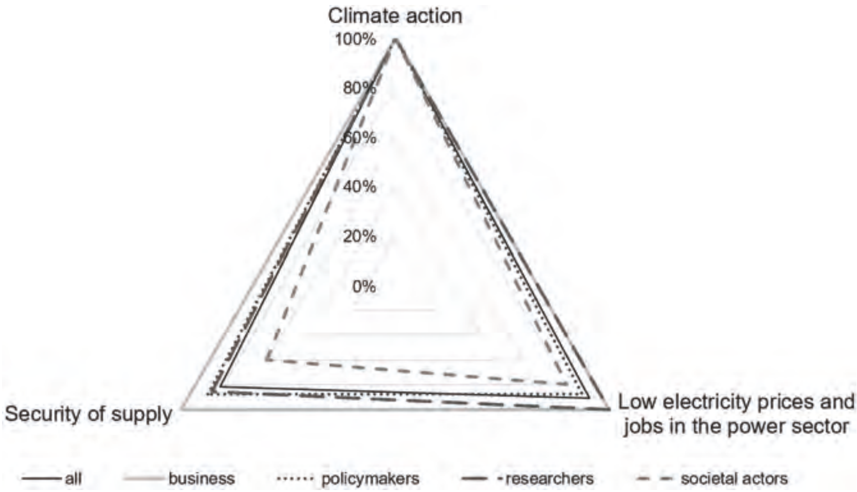

Figure 5.3 Objectives influencing the UK coal phase-out as shares of interviewees by category mentioning the respective objective.[2]

Climate action

A strong consensus on climate action emerged as one of the defining characteristics of the coal-phase-out situation in the UK. Climate change is now almost universally recognized as an issue that requires attention. All interviewees mentioned this high-level objective [r5, s1, s2, s3] or one or more of its sub-objectives. The sub-objective that came up most frequently was decarbonization of power or energy [b1, b2, p3, p4, p6, p7, r2, r3, r6, r7, s1, s2, s4]. A large number of interviewees also mentioned the broader objective of GHG emissions reduction, for instance in order to reach national climate targets [b1, p1, p2, p8, r2, r4, s1, s2, s5]. Another aspect is the transition directly to 100% clean power, hence not building new gas or using other fossil fuels as bridge technologies [p1, p2, s1, s2, s3]. Phasing out other, non-coal fossil fuels, including gas, was also mentioned as an objective by some interviewees [p5, s1, s3], as was phasing out coal itself [p2, p6, r6, s3]. The latter, however, was not mentioned very frequently as an objective on its own. The objective of stopping new coal from getting built was mentioned slightly more often [p4, p7, r1, r6, r7]. Several interviewees, however, pointed out that the decision to phase out coal was as a result of various factors, rather than an objective in itself [b1, p1, p4, p5, p6, p7, r1, r7, s2]. In line with this, some interviewees emphasized that the UK has a strong preference for market-based instruments to mitigate climate change. Hence, establishing an effective carbon price is another important objective in this category [b1, p6, p7, r2, r5, s1, s4], as well as the broader objective to create market conditions for decarbonization [b1, p4, p5, r5, r7, s4]. Shifting the economics away from coal to other energy sources was a key objective as well [b1, p2, p3, p4, p7, r1, r3, s1]. Arguably, certain actors' advocacy for the large-scale use of CCS [p8, r6, s5] can be categorized under this high-level objective as well, as this technology was meant to reduce GHG emissions. Another notable objective of the UK was to take an international leadership position on climate [p8, r3, r6, s1, s4].

Climate Change Act

The Climate Change Act in 2008 was a major milestone as it introduced the first binding target of 80% of emissions reduction by 2050 as compared to the 1990 baseline (Climate Change Act, 2008). It was voted upon almost unanimously in parliament [b2, s4] (Fankhauser et al., 2018) and helped the argument against new built coal [s1]. According to the Climate Change Act, carbon budgets are established every five years [b1, p3, r7, s4]. The Climate Change Act also established the Committee on Climate Change (CCC), an independent advisory body to the government that establishes and monitors carbon budgets and is considered to be very important and influential [p1, p6, r3, s5]. The following Energy Acts of 2011 and 2013 were also mentioned as they established capacity limits on emissions [p3] (Energy Act, 2013). One interviewee pointed out that, while the Climate Change Act set interim climate targets, it did not demand specific technologies and it was the RE targets of the EU that helped establish a priority for RE [p6]. Thus far, the UK has been successful in meeting its first two carbon budget targets as obliged by the Climate Change Act. As of 2018, total GHG emissions in the UK have decreased by 43% compared to the 1990 baseline. For energy supply, the decrease is even larger at 62% for the same time period (BEIS, 2020a).

Kingsnorth protests and public opposition to new coal

Due to the old age of existing coal-fired power stations and the expectation of rising demand [r1] as well as high gas prices [r3], two new coal-fired power stations were proposed around 2008–2009. One of those was by E.ON at the Kingsnorth site in Kent, which was met with mass protests from local movements and NGOs. The protests succeeded in putting pressure onto the then-Labor government so that, as a result, the government eventually ruled out the construction of new unabated coal power stations in April 2009, unabated meaning without CCS. This was the first major policy decision that was directly aimed at coal. As CCS ceased to be a viable option for power plants in the UK, the Kingsnorth decision turned out to be in hindsight, a de facto ban on new coal-fired power stations [r2, r6]. The protests and the subsequent policy decision were considered by several interviewees to have been an important event [r1, r2 r3, r6, s1]. It was also pointed out that stopping Kingsnorth and the other proposed new coal power stations from being built also prevented a lock-in similar to those occurring in other countries, like Germany, which have some relatively new coal-fired power stations [p5, r1, r6, s2].

Liberalized and competitive market

The UK's liberalized market structure was a very frequently mentioned context factor. Utilities as well as energy-intensive industries were interested in cost-effective investment, generating profits, and gaining or keeping market shares [b1, b2, p2, p4, p5, p6, p7, p8, r1, r4, r5, r6, r7, s1, s2, s3], which influenced their decision for or against coal. Following the EU LCPD in 2001 and later the Industrial Emissions Directive in 2010, the old age of most coal-fired power stations was a major factor in the decision of most operators not to retrofit their plants to meet the new requirements and prepare them for shutdown instead [b2, p2, p5, p8, r1, r3, r4, r6, r7, s1, s2, s4]. As part of the EMR in 2013, a carbon floor price for the power sector was introduced as a top-up to the EU-ETS, the price of which was considered to be too low to be effective [b1, p2, p4, p5, p6, p7, r1, r2, r5, s1]. Our interviewees widely considered the carbon floor price to be a major factor in the decline of coal [b1, p5, r2, r3, r4, r5, r7, s1], especially as it was effective in shifting the economics away from coal and in favor of gas [p2, p4, p6, p7, r1].[3] As one interviewee put it, the UK has an 'institutional love for carbon pricing' [r2]. The carbon price floor further served as a source of revenue for the Treasury and was not solely implemented for climate reasons [p5, p6, r7]. Furthermore, as several interviewees have pointed out, the cost of RE, especially offshore wind, has decreased significantly over the last few years [b2, p2, r1, r3, r6, s1, s4] (Evans, 2020), whereas, in the early 2000s, they had still been very expensive and had to be subsidized [p2]. As the UK has a large potential for offshore wind [b2, s4], it was the cost-effective answer to shift away from coal toward offshore and other RE [p2], which also helped reduce dependency on gas [r6].

Contracts for difference

The contracts for difference (CFD) scheme was one of the instruments introduced with the EMR of 2013–2014. CFD are large contracts that guarantee fixed electricity prices for new clean energy projects for a certain amount of time and were established to encourage the development of RE generation [b1, p1, r7]. Some interviewees emphasized that this scheme has been successful in establishing the offshore wind industry [b1, p3] and it has played a role in the decline of coal [r1]. However, one interviewee criticized that smaller contracts no longer get fixed prices, which discourages small-scale RE projects [p1].

Changing perceptions of CCS

The option of coal generation with CCS to abate the emissions was in the discussion mainly in the mid-to-late 2000s and some actors expected that the coal industry might transition into CCS at least temporarily [b2, r3, r6]. One argument in favor of CCS was the perceived need for large baseload generators [s1]. The Trade Union Congress (TUC) set up the Clean Coal Task Group in 2006 to make a case for sustaining some coal production with CCS to proactively propose a bridge from high to low carbon [r7, s5] (Clean Coal Task Group, 2006). It was debated whether to allow new coal power stations to be built if they were 'CCS ready' [r3]. The NGO community had differing views on the technology. While some NGOs agreed to it under the condition that it was full-scale CCS, others fundamentally rejected it [s1]. The 2009 decision not allowing new coal without CCS, however, made an investment in coal so much more expensive that it led to coal coming off the system entirely rather than utilities investing in CCS [b1, r2, r6, r7]. The government still invested in large-scale CCS demonstration projects, most notably the 'White Rose' project. However, it unexpectedly canceled the project in 2015, which caused anger in the industry and the loss of millions of euros of EU funding [p8, r3, s5] (Carrington, 2015). One interviewee pointed out that the coal industry initially had not invested in CCS at all, and as competition from gas increased, it was no longer economically viable [r6]. As of today, CCS has become uneconomic and is not expected to ever have a significant role in the UK power sector [b2, s1]. Trade unions have also shifted their stance away from CCS, one of the reasons being the residual carbon footprint [s5].

Party leaders' joint pledge on climate

Another important contextual factor along with the 'climate action' high-level objective is the increasing effort of all three main parties – Conservative, Labor, and Liberal Democrats – to claim some of the UK climate policy space [r3]. In February 2015, ahead of the general election, a group of NGOs and climate think tanks composed a pledge for the three main party leaders, David Cameron, Nick Clegg, and Ed Miliband [p2, r1, r4, r6, r7]. The letter, which was signed by all of them, consisted of three main parts: (1) to work toward a below –2°C compatible global climate deal at COP 21, (2) cross-party cooperation on carbon budgets according to the Climate Change Act, and (3) to accelerate the low-carbon transition and end unabated coal generation (Cameron et al., 2015). The letter was a conscious effort of the initiating organizations to create a common position for party leaders and depoliticize the issue of climate change [r4, r6, r7]. As reported by some interviewees, the third section on coal phase-out was added only at the last minute at the insistence of some groups, while others did not initially make it a priority [r4, r7]. Especially the role of the Conservative Party was remarkable. The Conservatives had the reputation of not being very environmentally friendly during a time where climate change was increasingly getting to the forefront of voters' minds. In the mid-2000s, the Conservatives wanted to increase their ambition on climate change and include this issue in their election manifesto [p2, p7, r1, r2, r3, r7, s1]. Several interviews mentioned that there was an increasing depoliticization of decarbonization and a political consensus on the need for climate action [b1, p6, r4, r6, r7, s4]. This led to a certain degree of competition among parties so that questions around climate action focused more on the 'how' and not on the 'if'.

International leadership on climate

Several interviewees mentioned the UK's efforts to position itself as a climate leader [p8, r3, r6, s1, s4], which is also why the UK wanted to increase its ambitions prior to COP 21 in 2015 [r4, r7, s4]. More recently, the objective of leadership on coal phase-out has emerged, such as in the form of the Powering Past Coal Alliance (PPCA) [p2, p7, r4, s4]. With the establishment of the PPCA, the UK aims to use its own record on coal use reduction to encourage similar transitions in other countries (Blondeel et al., 2020). In a broader sense, UK climate leadership ambitions also include international competitiveness and exporting low-carbon technologies such as offshore wind [p4, p5, p6, p7, p8, s1, s4].

Low electricity prices and jobs in the power sector

The question of how potential negative impacts of low-carbon transitions on the workforce, affected regions, and consumers can be cushioned has gained increasing importance. Cushioning those potential negative effects might also include more active state intervention to replace fossil fuel sectors with green sectors (Healy & Barry, 2017). The objective to create new jobs and infrastructure and attract low-carbon investment (such as RE and momentarily also CCS) was the most frequently mentioned aspect of the 'low electricity prices and jobs in the power sector' high-level objective [p1, p2, p3, p4, p6, p7, r2, r3, r6, r7, s1, s4, s5]. A close second was to keep consumer electricity prices low [b1, p2, p4, p6, r1, r2, r3, r6, s1, s5]. Other aspects that were mentioned were planning certainty for workers, regions, and companies [p2, p4, p7, r2, r3, s4] and just transitioning for workers, including retraining [b1, b2, s4, s5]. Individual interviewees also mentioned democratization and decentralization of energy [p3] and global justice issues of the fossil-fuel-based system [s3].

Influence of trade unions and the 1984–1985 miners' strike

Many interviewees stated that the decline of coal actually had its roots already in the 1980s, entirely unrelated to climate change, when the Thatcher government's fight against the coal unions resulted in the closure of hundreds of mines and the weakening of union power [b1, p1, p2, p5, p6, p7, p8, r1, r6, s2, s3, s4, s5]. The government's goal at the time was to break the power of organized labor [p1, s1] (Phillips, 2014). The events following the breakup of the 1984–1985 miners' strike were very dramatic as the coal mining communities suffered severe economic repercussions that continue to have an effect to this day in terms of weaker social, educational, and health outcomes [p2, r1, r2, s1] (Beatty et al., 2019). The breakup of the union and the massive loss of jobs in the coal industry in a short period of time is generally seen as a negative example of a transition. These negative traumatic experiences are still very present in the UK and there is a strong consensus that future transitions need to be more socially cushioned. The UK's domestic coal mining industry is now very small and has little political power [p1, p5, p6]. Another effect was the undermining of the political support base for coal [r3].

Job potential of RE and alternative industries

Some interviewees also mentioned the large job potential in RE, such as offshore wind [p2, s1], and other green sectors, such as retrofitting houses [r4, s4]. One interviewee named the Siemens wind turbine manufacturing plant in Hull as a positive example of just transition as it created several hundred jobs (Vaughan, 2016), some of them for former power plant or coal mine workers [s5]. This project was also said to have played a role in the UK's decision to continue with offshore wind [r7]. However, the regional development aspect must be kept in mind, as the jobs created by green industries are not necessarily in the same places as fossil fuel jobs [s4].

Debate about electricity prices

There have been public concerns, especially among Conservatives, about rising electricity prices in the early 2010s. A narrative employed especially by the coal industry was that coal would be needed to keep consumer electricity prices low (Brauers et al., 2020) [r6]. There were also concerns about the costs of offshore wind, which were originally perceived to be very high [r3, s1, p2]. However, offshore wind and other renewables became much cheaper in the second half of the decade and this has had a major political impact with respect to the feasibility of the energy transition [p2, r1, r6, s1, s4]. Furthermore, the coal phase-out decision of 2015 has not had a major influence on energy prices (Yilmaz et al., 2016) [p2].

Security of supply

The high-level objective 'security of supply' was mentioned by many interviewees [b1, p2, p4, p6, p7, p8, r1, r2, r3, r4, r6, r7, s2]. More specifically, a key objective was to meet demand and increase capacity margins, for instance by expanding RE and increasing overall electricity supply [b2, p3, p5, p6, r1, r3, r4]. Several interviewees also mentioned the objective of utilizing gas as a transition fuel to replace coal [b2, p2, p4, p7, r1, r2, r5, r7, s1, s4]. Closely related are issues of grid management and electricity mix, such as ensuring system stability and flexibility with higher shares of RE or ensuring baseload [b1, b2, p3, p4, r2, r4, r6, r7, s4].

Declining energy demand

An important contextual factor along with the high-level objective 'security of supply' is that, in the 2000–2010 decade, the assumption was that electricity demand would keep rising [r1, r3]. However, this has not been the case and demand has actually been falling [r1, r3, r7]. In 2005, final users consumed 349.35 TWh of electricity. By 2019, this number had decreased to 295.48 TWh (BEIS, 2020c), increasing the competition between remaining fossil-fueled electricity providers. The two main reasons for demand reduction as stated by interviewees were the shift from heavy industry to high-value manufacturing and services that occurred mainly in the 1990s and 2000s [r1, r3], as well as better energy efficiency of lighting and white goods, which was partly due to the EU Ecodesign Directive, as well as industrial energy efficiency [r1, r3, r7] (Evans, 2019).

Reporting of capacity margins

As some interviewees mentioned, there were significant concerns about future energy security due to the tightness of capacity margins in electricity, which also affected the coal phase-out debate [p2, p3, p6, p7]. However, as one interviewee pointed out, it turned out later that the capacity gap was not as small as initially thought, which was due to the way the tightness of margins was reported. Since visibility was only at a very high level, many capacity additions from onshore wind and solar were not measured. Based on this perceived tightness of capacity margins, government ministers wanted to keep some coal in the system to avoid security of supply issues [p3]. Security of supply concerns was the main reason for the establishment of the CM.

Capacity market

The CM was also part of the EMR and includes payments for generators for standing ready as well as additional payments if they actually provide supply [p3]. It was designed with the aim of encouraging the construction of new gas power stations to compensate for coal and thus ensure security of supply [b1, p6, r7]. Opinions on the effectiveness of the CM differed among interviewees. Some interviewees stated that it has generally been successful [b2, p4]. Others criticized that the CM initially had no carbon intensity limitations, which meant that coal power plants could get long-term contracts under certain circumstances [p3, r2, r7, s1]. Some interviewees argue that the CM has slowed the coal phase-out and kept some coal power plants on the system longer than they would have otherwise [b1, p3, r2]. The number of CM agreements for coal power stations has since decreased and it is expected to get to zero in future auctions [p4].

Discussion

To summarize, the phase-out of coal-fired power generation in the UK appears to be very successful for a number of reasons. First of all, there are several context factors that have led to low political stakes in coal. Furthermore, there is a high political consensus on climate change across the major parties, which enabled effective climate policies. More recently, the change in the perception of the CCS technology has further ruled out coal as a viable source of future electricity.

While the demise of coal seems inevitable, it is not entirely clear where the UK energy system is headed as a whole, as RE compete with nuclear and gas. Although barely mentioned in our interviews, it is important to note that the Hinkley Point C nuclear power station is currently under construction. The project is highly controversial; studies have found that it would have been more cost-efficient for the UK to invest in RE than in nuclear (Johnstone et al., 2017; Schneider et al., 2020; Suna & Resch, 2016). Further challenges arise with respect to gas, which needs to be phased out or decarbonized in order to meet the net zero target. There have been intense debates about the extraction of shale gas, which has been favored by governments but faces major public opposition (Bomberg, 2017; Johnstone et al., 2017). Increasing shares of RE have played a significant role in covering the UK's electricity demand. However, during the study period 2000–2020, government support for RE has varied substantially. Financial support for RE, especially through feed-in tariffs, has declined, which especially affected the solar industry and has hindered the development of solar energy in the UK (George, 2020).

It will also be interesting to see how the Conservatives position themselves in the future with regard to climate protection policies. As mentioned above, they have been speaking out more strongly for climate protection since the middle of the 2000s, but their policies have not always been in accordance with this. For example, when a Conservative majority government was elected in 2015, many environmental policies were stopped initially [p7, r7] (Vaughan & Macalister, 2015). However, by 2015, the majority of Conservative MPs were in favor of the coal phase-out, which became part of their election manifesto in the shape of the aforementioned cross-party climate agreement [p2]. The final decision to phase out coal was therefore, as mentioned by some interviewees, a measure to strengthen their climate credentials [p7, r2, r7].

As the UK is one of the first countries to have nearly completed the transition away from coal power generation over a relatively short period of time, the question that suggests itself is whether other countries can derive lessons from the UK's coal phase-out experience. Several interviewees stressed that every country and market is different and there is no 'one-size-fits-all' type of solution [b2, r1, r3, s1]. What was pointed out frequently is that, in countries with a strong domestic mining industry, like Germany or Poland, regional and employment aspects add an additional layer of complexity that was not as prominent in the UK in the 21st century [p2, p6, p7, p8, r1, r2, r3].

What was also mentioned frequently was the effectiveness of creating appropriate market conditions for decarbonization [b1, p3, r2], particularly strong carbon pricing for the power sector [p2, p5, p6, p7, r3, r7, s1]. However, as many interviewees have emphasized, carbon pricing is not a stand-alone solution but should rather be one component of a policy mix that is tailored to the country's individual circumstances [p4, p6, p7, r3, r4, s1]. The need for accompanying policies to support investment in low-carbon energy was mentioned frequently to replace phased out coal capacity [p1, p5, p6, p7, r4, s1, s4].

Conclusions and outlook

The UK has almost completed its phase-out of coal generation over a relatively short period of time. In the 2000s, at the beginning of our study period, coal's share of the UK electricity mix was at a relatively constant rate at around 27%–37%. Starting in 2013, its share began to shrink rapidly to merely 1.74% in 2020. As part of this, by 2020, overall GHG emissions of the UK have been reduced by 48.8% compared to 1990 (BEIS, 2021b). This chapter identifies objectives, actors, and contextual factors of the UK coal phase-out using the AOC Framework by Jakob et al. (2020). From our evaluation of 22 stakeholder interviews, we derived 3 high-level objectives that have influenced the UK case: (1) climate action, (2) low electricity prices and jobs in the power sector, and (3) security of supply.

The UK coal phase-out has been enabled by a variety of policies and contextual factors. Notable policies include effective carbon pricing and support for the RE industry. Climate ambitions in all three major political parties, the importance of scientific advice and the avoidance of political polarization on the issue played a major role as well. Security of supply issues didn't become a major problem as inter alia electricity demand – other than expected – was falling considerably. The coal-fired power stations in the UK were old, and the civil society protests, especially in Kingsnorth, prevented the construction of new power stations in the 2000s. Unlike in other countries, like Germany (Brauers et al., 2020; Oei et al., 2019), the coal companies did not use their political power to slow down the decision to phase out coal because they had little to lose. They decided early on to invest in other energy sources. The official announcement to phase out coal that was made in 2015 is widely considered to be merely a formalization of something that would have happened anyway due to the preceding developments and policies that have shifted the economics away from coal.

As a more recent development, in 2019, the UK has legislated for net zero emissions by 2050 due to the scientific evidence of the IPCC 1.5°C report and the CCC, as well as public pressure from climate movements. However, this is unlikely to have any significant further impact on the coal phase-out, which is already well underway. Instead, future challenges for the UK are related to natural gas, especially with respect to heating, as well as the future of transportation. In summer 2020, the UK experienced a coal-free run for 67 days, which was only interrupted for maintenance purposes of a coal power station (National Grid ESO, 2020). Much like in many other countries, the Covid-19 pandemic further raises the issue of how to achieve a climate-friendly economic recovery post Covid in the UK.

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Appendix

This chapter contains supplementary online material at www.mcc-berlin.net/pecoal/ch05.

Notes

1 Kilroot power station is going to be converted to gas by winter 2023 and West Burton does not hold a capacity market contract for winter 2021–2022. Ratcliffe and Drax do hold capacity market contracts for that period, but the latter has ceased coal generation and only keeps its coal capacity on standby (Evans, 2021). In line with the coal phase-out announcement, Ratcliffe power station will have to close by 2024 as well.

2 Please note that we were only able to conduct two interviews with business officials, a number that is too small to constitute a representative sample.

3 Gas in the UK was and often is also still cheaper than in many other European countries due to the availability of domestic production (Brauers et al., 2020).

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6 Market-led decline amidst intense politicization

Coal in the United States

Jiaqi Lu and Gregory Nemet

Introduction

Over the last two decades, the US coal industry has served as a high-profile battleground of polarized politics—while also steadily declining (Ballew et al., 2019, Skocpol and Hertel-Fernandez, 2016). Central to this decline and coal's influence has been a change in expectations. The 2010–2020 period saw the outlook for US coal change dramatically—from the one of new plant construction and mine expansions that would continue to boost the industry for decades, to the one of early plant retirements and mine closures that halved coal's contribution to energy supply. Moreover, government forecasts and elicitations from our interviewees are in consensus that coal will continue to decline through the 2020s, with the only disagreement on the extent. During this process, coal interests have been fought to preserve their industry by exploiting the institutional weakness and utilizing the widening divide between conservative and progressive politics. Conservative politicians, funded by coal interest groups, attracted support from coal miners by providing a voice to their economic hardship, as well as the identity and culture of the coal mining communities. Pro-climate NGOs have also tried to help local coal communities manage the transition from coal to relieve the pain associated with coal's decline in the notable absence of transition aid from states and the federal government. This chapter will show that the decline of coal in the United States is mainly driven by inexpensive alternative energy sources and a regulatory system whose primary objective is minimizing electricity costs. The politicization of coal, on the other hand, is shaped by a group of industrial, social, and political actors with different objectives, highly embedded in the United States's distinct socioeconomic and political context.

Existing scholarship on the political economy of coal in the United States has shown that technological change, business interests (Stokes, 2020, Skocpol and Hertel-Fernandez, 2016, Downie, 2017, Berardo and Holm, 2018), and political movements (Brulle, 2018, 2019, Stokes, 2016, Breetz et al., 2018, Farrell, 2016) have been influential, not just on the industry but also on US energy and climate policy more broadly. Despite the extensive literature on this topic, we still do not have a comprehensive answer to the question of *why the coal industry has failed to resist or even slow down its rapid decline despite having enormous*

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political support? An abundance of studies provides answers related to the development and impacts of environmental regulations (Layzer, 2012, Davis et al., 2016), challenges from alternative fuels (Stokes and Breetz, 2018), interest group influence (Stokes, 2020), and public opinions on non-carbon energy and climate change (Karol, 2019, Ballew et al., 2019, Ansolabehere and Konisky, 2009, 2014). These studies provide important glimpses on particular aspects. Our article contributes to this literature by providing a comprehensive assessment that documents the institutional context, the divided political environment, relevant stakeholders, social and political actors, as well as public debates on climate issues and the logic behind the political rhetoric.

Building on the theoretical framework proposed in Chapter 1, we consider energy and climate policy to be shaped by multiple social and political actors with diverse objectives, each operating within an idiosyncratic country context (Jakob et al., 2019). We identify the competing objectives, stakeholders, and contextual factors that explain why coal has dominated political debates despite unfavorable economics and a rapidly shrinking share in the energy mix. We draw on 20 semi-structured expert interviews (conducted face-to-face, over the phone, or over Zoom) with representatives who shape climate and energy policies in the United States, including regulators and legislators at the state and federal level, utilities, industry, civil society, as well as nongovernmental organizations (see Table A6.1). We identify key stakeholders for interview using snowball sampling method that relies on expert referrals. For details of the semi-structured interview questions, please see the interview guideline in the Online Appendix. The extensive data collected in expert interviews that shed light on otherwise hidden interrelations between electricity markets and politics could not only explain the decline of coal but also help us understand the political implications for deep decarbonization beyond coal. Based on the interview data, we identified a group of actors and contextual factors that influence energy and climate policies in the United States. These actors include federal and state regulators and politicians (national and regional policy makers and political actors), utilities and the coal mining industry (public and private economic actors), and domestic civil society (societal actors). We also identify four high-level objectives: affordability, reliability, climate change mitigation, and employment.

Country context

US electricity supply has changed dramatically over the past decade and a half. The share of electricity from coal-fired power plants decreased from 50% in 2003 to 23% in 2019. This section provides an overview of coal energy in the United States, focusing on the technological and economic environment. The major contextual difference between the United States and many other cases in this book is that coal is currently in a sharp decline; plants are retiring, and no new construction has occurred in the past ten years. Coal has been driven out of the market mainly by inexpensive natural gas, wind, and solar energy.

Changes in these competing technologies are more important than policies and the efforts of interest groups. Electric utilities, the primary consumers of coal, are actively phasing out coal for economic reasons, accommodate socially responsible investing, respond to their customers' preferences for clean power, and retain their social license to operate. From a policy perspective, these developments are driven not by any concrete federal climate regulations, but by the anticipation of possible legislation in the future.

Market conditions and the decline of coal

Coal consumption in the United States has declined from its peak in 2007 of 1 billion tons to 535 million tons (mt) in 2019. As of 2019, the electricity sector accounts for nearly 92% of domestic coal consumption. With total US electricity consumption remaining mostly constant since 2005, steam coal consumption was nearly cut in half from its 2007 level. The remaining 8% is used by the manufacturing industry, including coking, food, paper, steel, and other industrial sectors. Industrial coal consumption has also declined, from 75 mt in 2007 to 38 mt in 2019 (EIA, 2020a).

The main driver behind the decline of coal in the power sector is technological change that has made electricity from natural gas, wind, and solar energy much less expensive than in the past. As shown in Figure 6.1, the levelized cost of electricity (LCOE) from coal has been stable over the past decade, while the cost of cleaner alternatives—natural gas, wind, and

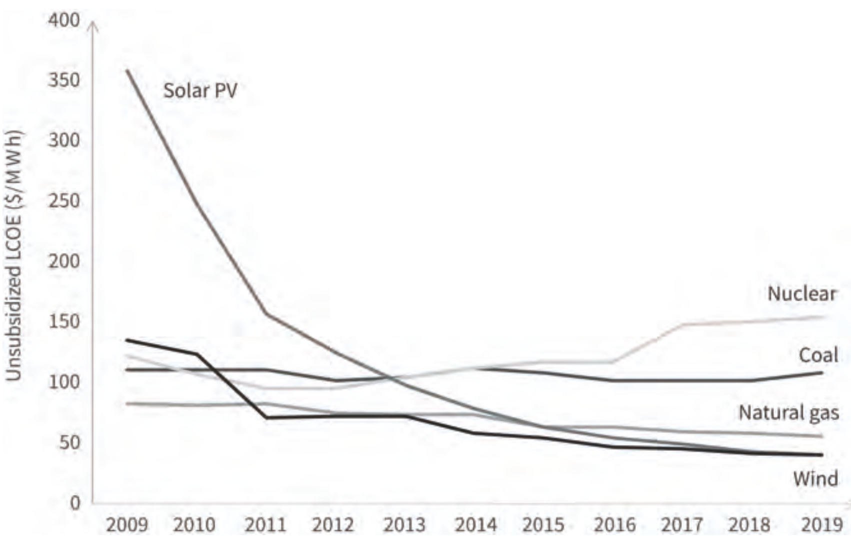

Figure 6.1 Unsubsidized levelized cost of electricity for US power generation 2009–2019.

Source: Lazard's Levelized Cost of Energy Analysis.

solar—has all decreased. In particular, the levelized cost of wind and solar have dropped from more than $145 per MWh and $360 per MWh in 2009 to $45 per MWh in 2019 (LAZARD, 2020). The levelized cost of coal-fired power plants is roughly twice that of a natural gas plant, which is also smaller, more efficient, more flexible, and thus more compatible with intermittent renewable energy in its ability to ramp up and down quickly. As coal has become relatively more expensive, the average capacity factor of coal power plants has decreased from 67% in 2010 to 40% in 2020 (EIA, 2021b), making coal electricity more expensive to produce as fixed costs must now be spread over fewer electricity outputs.

The competitive disadvantage of coal has changed utilities' planning for new electricity generation projects. Utilities, and independent power producers who sell electricity to utilities, choose natural gas, wind, and solar to meet new electricity demand. Most dramatically, utilities are shutting down existing coal plants. Some of these are quite old plants, but others are being shut down decades before their normally expected retirement dates.

The changing prospects for coal come on top of a decades-long lack of new investment in coal as US power infrastructure aged. Between 2010 and 2018, the average age of coal fleets in the United States is 42 years old, while the average retirement age is around 55 years old (EIA, 2019). Many coal power plants have been run up to 20 years beyond their designed retirement age. Over the same period, the electricity sector retired more than 89 GW of coal-fired capacity from its peak in 2011 to 229 GW in 2019, replacing 546 coal units with mostly natural gas-fired combined-cycle plants, solar, and wind energy. Utilities and independent power generators plan to retire an additional 22 GW of coal capacity by 2030, as is shown in Figure 6.2. This trend has accelerated since the Trump administration took office in 2017. From 2016 to 2019, the annual retired capacity has nearly tripled, while the average retirement age has decreased by roughly ten years over the same period. This means younger and bigger coal facilities have been retired despite changes in the political environment.

The rapidly changing energy market can be best illustrated by the Energy Information Administration (EIA) annual energy outlook. The outlook of coal production reflects the changing market prospects of coal over the last 15 years. As shown in Figure 6.3, predicted coal production in 2030 has decreased from 1,544 mt in the 2006 energy forecast to 484 mt in the 2020 forecast. The overall trend of EIA forecasts shifted from growing in 2006–2012 to relatively stable in 2013–2015, and to a significant decline in 2016–2020. To provide a more independent view about the prospects for coal, we asked the expert interviewees for their predictions of the share of electricity production from coal in 2030, and then compared these predictions with historical and forecast data from the EIA. Figure 6.3 shows that experts' market expectations of coal are clearly more pessimistic than that of the federal government. Most interviewees contend that coal companies also share their pessimistic view about the future of the industry. These changes regarding

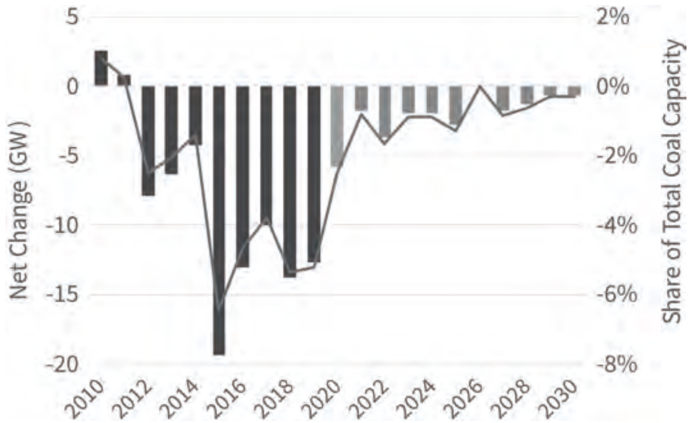

Figure 6.2 US coal power plant retirements 2010–2030.

Source: US Energy Information Administration, Annual Electric Generator Report and Preliminary Monthly Electric Generator Inventory.

market expectations play an important role in understanding the actions of firms and interest groups in the US coal industry.

Coal industry response to the decline

The coal mining and utility industry has been slow to respond to what has turned out to be a dramatic change. The changing market expectations largely determine the responses of the coal mining and coal power industry. Figure 6.4 demonstrates that expectations about the future of coal began to shift in 2007, the first year of less than 1% annual expected growth after a decade of expectations of 1%–2% annual growth. 2010 was the first year in which coal production was expected to decline. Expectations of a gradual decline (1%–2%/year) began to accelerate in 2015; by 2020, the outlook for the next couple of years was sharp declines, over 10% per year. The government forecasts in 2019 and 2020 became aligned with expert interview responses in 2020, which showed median expectations of a 6% annual decline through 2030.

In response to the shrinking domestic demand, the coal mining industry has been adopting several strategies, including diversifying business structure and exploring opportunities in the steel and coal-chemical industry [sn3].[1] Additionally, many coal mining companies are trying to expand the market for exports, which identified many interviewees as the "key strategy that keeps them alive" [pr1, pn1, sn1, sn3, r2, b1, sn5, pn2, pn3, b2]. However, the prospect of coal export is limited because of strong competition and high uncertainty associated with the Asia market (see a more detailed discussion about the export market in the Online Appendix). Domestically, US coal

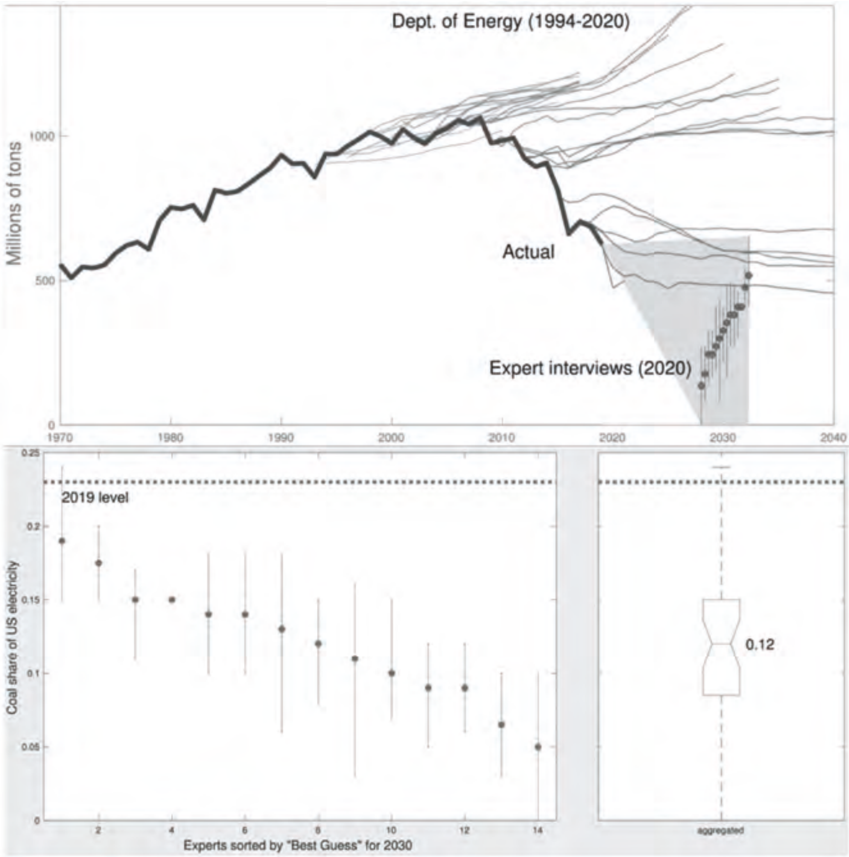

Figure 6.3 Expert assessment and EIA outlook of coal production in the United States.

Note: The most recent EIA forecast is "short term," that is, for 2020 and 2021, published on May 12, 2020, and accounts for the COVID-19 recession.

Source: EIA Annual Energy Review 2011, Annual Coal Report, Annual Energy Outlooks 2006–2020.

exports also face regulatory uncertainty, lack of infrastructure, and political challenges from environmental groups. Experts pointed out that a future democratic administration could easily constrain the economics of export by imposing more regulations on mining, transportation, and storage [pn1]. More importantly, coal export to the Asian market has been limited by the port capacity on the West Coast [sn4, sr2, pn2, pn3, b2]. As of 2019, there are only three small export terminals with limited export capacity located on the Californian coast. Although the coal industry has been urging port capacity expansion, such effort has faced strong pushbacks from local communities and city governments [sr2].

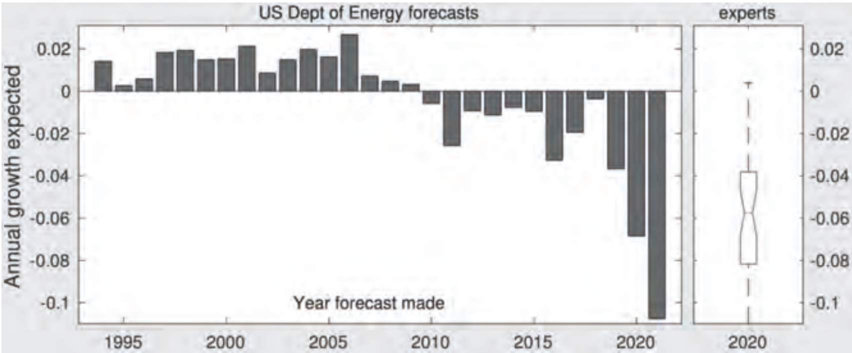

Figure 6.4 Growth rates in US coal production implied by government and expert forecasts of future coal production.

Note: Growth rates are calculated over the first five years of the forecast. Experts were interviewed in early 2020.

Policy objectives

The electricity sector in the United States is highly regulated and is still dominated by local monopolies, despite efforts to introduce competition over the past three decades. At the federal level, energy and electricity are under the regulation of the Department of Energy (DOE) and the Federal Energy Regulatory Commission (FERC), and environmental issues are under the jurisdiction of the Environmental Protection Agency (EPA). Public Utility Commissions (PUC) at the state level regulate electricity providers, such as utilities and independent power producers. Although their regulatory boundary varies from state to state, the most important functions of PUCs are rate setting, generation, transmission project approval, and reviewing business decisions faced by public utilities.

We group actors' objectives into four high-level strategic objectives of energy policy: affordability, reliability, climate change mitigation, and employment. In particular, affordability was highlighted by interviewees as the most important objective that shapes energy policies. Indeed, PUCs typically mandate utilities provide electricity at just and reasonable rates. Climate change mitigation, regarding both environmental and climate impact, was also identified by most experts. Although security is a major focus in the political discourse, it did not stand out as a crucial concern in our interviews. Perhaps the reason that security did not emerge in interviews is that coal, natural gas, wind, and solar are abundant domestically in the United States, so neither coal nor its competitors can make credible claims of being preferable on energy security grounds. Finally, employment and economic development for local coal communities stand out as major concerns for regional societal actors and politicians. Table 6.1 presents an overview of objectives, relevant actors, and the contextual factors shaping energy policy making in the United States.

Table 6.1 Objectives, actors, and cross cutting contextual factors of US energy policy

Objectives of energy policy	*Most relevant actors*
Affordability	FERC, PUC, utilities
Reliability and security	DOE, FERC, coal mining industry
Climate change mitigation	State-level legislature, EPA, NGOs
Employment	Local coal community, local government, NGOs, politicians
Crosscutting contextual factors	
Inexpensive, cleaner, technological advanced alternatives	
Polarized political environment	
Organized interest groups	
Lack of government supports for job creation in coal communities	

Affordability

The US federal government has been devoted to lowering energy prices and has branded cheap energy as one of the competitive advantages for US businesses. Over the past decades, the United States has had one of the lowest electricity rate among advanced economies. The rate for the industrial sector is even lower than that in many developing countries, such as China. In 2019, the residential, commercial, and industrial sectors accounted for 37%, 36%, and 26%, respectively, of the total US electricity consumption (EIA, 2020b). On top of that, some states and the federal government often provide various energy assistance or efficiency programs for low-income families, further improving energy equity and affordability. Many states also intend to minimize the electricity rate to attract investment, especially for the manufacturing industry. Therefore, minimizing electricity rates for local consumers is the most important regulatory objective for the PUCs and a critical principle of the wholesale market designed by the FERC. The average electricity rate varies from state to state (ranging from 7.77 cent/kWh in Louisiana to 29.04 cent/kWh in Hawaii, averaging at 10.80 cent/kWh). In general, it is highest for the residential sector (13.36 cent/kWh), and the lowest for the industrial sector (6.91 cent/kWh), with the rates for the commercial sector (10.88 cent/kWh) in between (EIA, 2021a).

Electricity market deregulation has also contributed to this objective. Traditionally, the US electricity markets have been strictly regulated, where a public utility serves as a natural monopoly in a given region. In regulated markets, utilities hold control over all electricity services across much of the country, from electricity generation, transmission, distribution, all the way down to customer metering. The PUC in charge of rate setting and project approval aims to minimize electricity rates for the local customer while ensuring a fixed profit margined for investors. Following the enactment of the National Energy Policy Act of 1992, the federal government started to allow power producers to compete for selling electricity to utilities. In the late 1990s, the FERC issued three orders to establish several regional transmission operators (RTOs) and independent system operators (ISOs) across the country, ensuring utilities' fair access to the grid. In the 2000s, several large states, including California, Texas, and New York, initiated the deregulation reforms. Today, a total of 15 states have initiated reforms with different levels of deregulation and different emphases. The most common feature for all these reforms is to involve competition in both generation and service provision to lower prices and improve services. A significant consequence of such reforms has been the rise of investor-owned utilities, which issue stock traded on stock exchanges and with a fiduciary responsibility to shareholders to maximize shareholder value.

Under the price pressure from regulators and market competition, coal technologies, such as carbon capture and storage, once seemed profitable have become too expensive (see detailed discussion about CCS technology in the Online Appendix). Utilities, which consume more than 90% of US coal, have no choice but to build the most inexpensive power plants in order to minimize the electricity bill for customers. As the costs of natural gas and renewables have become much lower than that of coal, it is in utilities' best interest to choose those technologies instead of coal to keep rates low and fair, even without additional climate regulation. Although the affordability objective is picked up by societal actors and national/regional policy makers who are pro-coal, to some extents, their narrative contradicts their goal, because using coal for electricity production would result in higher energy bill in most parts of the United States.

Reliability and security

As alternative sources obtain increasing market advantage over coal, coal-heavy utilities and the coal mining industry start to stress grid reliability and energy security as their core competitiveness [pr1, b1]. Experts who are familiar with energy lobbying described how coal lobbying groups have switched from claiming "cheap and widely available" to "a reliable and secure energy source" as the main selling point for coal power [pr1].

The concept of grid reliability, also known as system security, is built on the idea of baseload power sources for providing stability and resilience to the electric system during times of grid constraint. Coal advocates argue that coal-fired electricity can provide critical capacities to stabilize the grid and electricity prices in the wholesale market, especially during winter. Hence, they claim that coal-fired power plants deserve additional service fees to help them stay in business [pr1, sn3, pn3]. For example, America's Power (2020), an interest group that advocates on behalf of coal-power plants, indicates that the acceleration of coal retirement could lead to a 35% or US$ 29 billion increase in electricity bill due to extreme cold weather across multiple markets by 2024, while keeping those coal units could cut down such cost by over 93%. In 2018, FirstEnergy Solutions, a utility company that owns coal and nuclear power plants, asked the DOE to invoke its emergency power under Section 202(c) of the Federal Power Act to provide cost recovery to coal and nuclear plants for the next four years. This request was immediately rejected because the DOE has never issued an emergency order for economic reasons (Walton and Bade, 2018). Granting coal facilities that kind of bailout might have provoked waves of lawsuits from environmental groups and the renewable industry.

Unsurprisingly, the security narrative resonates well with the policy agenda of the Trump administration. Since Trump took office in 2017, the DOE has been invoking electricity market regulations that favor coal fleets in the name of system security, and even considered invoking executive power under the 1950 Defense Production Act (DPA) to boost coal-fired electricity production (John, 2018). However, there are only limited measures that the executive branch can use on security grounds. In late 2017, Secretary of Energy Rick Perry filed a Notice of Proposed Rulemaking that intended to provide bailouts for coal and nuclear power plants that maintain 90 days of fuel supply, citing the importance of grid resilience due to natural gas and renewable penetration, and unfair wholesale market design in favor of them (FERC, 2018). In 2018, this proposal was unanimously rejected by the FERC, despite the Commission's consisting of two Democrats and three Republicans, four of whom were appointed by President Trump. The FERC ruled that the DOE failed to provide evidence to support their claims, citing reports from RTOs/ISOs that show no security concern due to coal plant retirements (FERC, 2018).

Climate change mitigation

The third high-level energy policy objective concerns environmental and climate challenges. For decades, various social actors, including progressive think tanks, NGOs, and activists, have been pushing climate and environmental legislation at the state and the federal levels. More recently, pro-environment and pro-climate change grassroots movements have formed a strong anti-coal coalition, which imposes public pressure on utilities and banks to divest from coal. Experts express that such public pressure helps motivates utilities to choose natural gas or renewables over coal facilities out of public image concerns [sr2]. Many banks and institutional investors across the country have also committed to divestment. The divestment movement takes many forms. For instance, socially responsible investing (SRI), an investment strategy championed by investment banks such as BlackRock,[2]encourages investor-owned utilities to retire coal to placate shareholder activist groups. Furthermore, over the last few years, students have become a new powerful force in pro-climate change movements. Famous youth-led climate strikes, such as the Youth Climate Movement, have spread across the United States, calling the county, state, and federal government to take immediate climate actions and declare a climate emergency.

Federal-level policies

Even though an overwhelming majority of Americans support more progressive federal policies to address climate change (Tyson and Kennedy, 2020), climate legislation remains stagnated in the US Congress. In the early 1970s, protecting environmental quality had received considerable bipartisan support as much of the nation's landmark environmental legislation, most importantly, the Clean

Air Act, was passed during the Nixon administration. However, since the late 1970s, the United States has experienced serious political polarization at both the state and the federal levels (Caughey et al., 2017, Grumbach, 2018, Lowry, 2008). Such division along partisan lines is also found on environmental issues. As the memory of the oil crisis in the 1970s faded away, energy policy became increasingly aligned with environmental policy (Lowry, 2008). The bipartisan support for energy and environmental policies decreased in the polarized political environment. When climate change first entered the sight of the general public in the late 1980s and early 1990s, the idea of shifting away from fossil fuels was already highly political. As a result, energy policies have become regulatory, and the prominence of partisanship on the issue increased over time. Scholars have found sharp polarization of conservative-liberal opinion about energy and environmental matters after the Cold War (McCright et al., 2014).

Highly organized fossil fuel interest groups contributed to the political polarization on climate change at both the state and the federal levels (Grumbach, 2019, Stokes and Breetz, 2018, Jacques et al., 2008). In the past 13 election cycles, the coal mining industry has been the largest source of campaign finance within the mining industry, with 88% of those going to Republican candidates.[3] In the early 2000s, the coal interest groups wield significant influence in Washington D.C. As one interviewee recalled:

> We [Senate democrats] tried to get [environmental/climate legislations] enacted during the Bush administration … we were very close to a deal in 2001, so there would have been limits on the utility industry … but the Coal Industry and the Mining Association got to the Vice President's office, and they killed that bill. And they also got the President (Bush) to reverse his pledge during the campaign to control carbon dioxide from power plants [pn1].

Coal interest groups found their natural allies in the conservative movement. Conservative think tanks, backed by the fossil fuel industry and the auto industry, play a major role in developing the rhetoric and talking points to support a position of climate denial (McCright and Dunlap, 2000, Boussalis and Coan, 2016).

During the Obama administration, environmental regulation was the primary policy tool to reduce coal consumption. The most consequential regulations were the *Mercury and Air Toxics Standards (MATS)* that targets mercury emissions and the *Cooling Water Intake Rule* that manages wastewater from power plants [pr2, sn3, r2, b2]. In particular, the *MATS* regulation, proposed in 2008–2009 and passed in 2012, imposed high costs (+100% operating costs) on old coal power plants, incentivizing many utilities to switch to gas rather than investing in pollution control equipment for coal units [r2, pr3, b3]. Experts suggest that the *MATS* alone contributed to roughly 5%–10% of total coal retirements to date [r2]. The *Clean Power Plan (CPP*), the Obama administration's centerpiece energy and climate policy, although highly celebrated, was never officially implemented, in part due to opposition from conservative politicians and pro-coal actors (see the online Appendix for more detailed discussion).

Under the Trump Administration, the EPA has been rolling back environmental and climate regulations that constrain the coal mining and utility industry. It is commonly believed that conservative politicians and coal interest groups are colluding with each other to bring coal back by ending "the war on coal." Yet, the coal mining industry has long realized that regulatory relief could not reverse market force and revive coal [pn3]. As one interviewee put it:

> Politicians argue that [rolling back regulations can revive coal] … They [coal companies] do not argue that … most of them are just getting out of the business, they're selling assets or they're going bankrupt … Bob Murray[4] is sort of the case in point. He has asked for an enormous bailout in the stimulus package. And he has repeatedly asked for government bailouts because it's the only way that he can remain economic … What he says in public is different than the things he asked for, he doesn't ask for regulatory relief. He asked for cash [pn3].

The Trump EPA also repealed the *CPP* and replaced it with a much weaker *Affordable Clean Energy (ACE)* rule, which would lower power sector carbon emissions by 11 mt by 2030, or between 0.7% and 1.5% from its 2005 level. Even though the high-ranking Trump appointees in the DOE and the EPA often take a hostile position toward climate change, mid-level and lower level bureaucrats were still taking the issue seriously and continued to prepare for future climate actions [pn4]. Under the Biden Administration, the federal government was able to reinstate and strengthen Obama-era regulations. President Biden has brought the United States back to the Paris Agreement and announced to use new executive orders to tackle climate change (The White House, 2021). However, it is unlikely a future Republican administration would continue to support these climate actions without new legislation from Congress.

State-level policies

With the US Congress in gridlock,[5] many energy and climate policies that matter the most for the future of coal consumption are implemented by states [r1, r3, sn4]. When the Trump Administration withdrew from the Paris Agreement in 2017, some state governments led open protests against the federal government. Since 2016, a total of 34 states – including some Republican states – have released or updated their state-level climate action plans, which generally include greenhouse gas mitigation targets and detailed policy tools to meet those goals.[6] Nine states, together representing 40% of US greenhouse gas emissions, have passed laws mandating 100% carbon-free electricity by 2050 (Podesta et al., 2019).

One of the most important state policy tools to date for climate mitigation is the Renewable Portfolio Standard (RPS), which requires a specified percentage of electricity from local utilities generated by renewable sources. From the late 1990s to the early 2000s, several states at the demand centers, including California, Texas, and some New England states, led the effort to put the RPS into state law. As of 2020, a total of 38 states have implemented either a renewables mandate (31 states) or a volunteer target (7 states), with wide variation in terms of compliance options (NCSL, 2020).

With the rapid growth of RPS popularity, the slow response of the coal industry in the 2000s and intense lobbying in the 2010s reflect substantial changes in market expectations. When the RPS was first introduced, the coal industry fails to anticipate that it could help make the renewables so much more competitive, and so did not lobby against its implementation (Stokes, 2020). However, as market conditions changed dramatically, coal interest groups across the country mobilized to prevent further state legislation. As a result, all mandated RPS were written into law before 2008. Since then, utilities and the coal mining industry have successfully blocked RPS in the states that did not yet have them and repealed West Virginia's RPS, which was passed in 2009. The latest attempt to strip the RPS is the *2019 Ohio House Bill 6*, which replaces the RPS requirement of 12.5% in 2027 to 8.5% by 2026, along with other pro-coal articles (The Ohio Legislature, 2019). A serious corruption scandal that involved FirstEnergy Corp. and Speaker of the Ohio House of Representatives was discovered to be behind the passing of this legislation (Wamsley, 2020). This incident once again suggests that the legislature and regulators can be easily captured by coal interest groups.

Renewable energy interest groups also have growing political influence in liberal states such as California and Washington. The renewable energy industry coordinated with environmental groups to advocate for investment rebates and higher RPS targets at the state level and tax credits at the federal level. Unlike the fossil fuel lobbying associations that are concentrated, the number of renewable lobbying associations is relatively high, partially due to the distributed nature of the industry (Kang, 2016), making it difficult to funnel resources and political influence to clean energy producers. Despite having the fossil fuel lobby as the common enemy, surprisingly, renewable interest groups also devote resources to lobbying against nuclear power. As the competition between different low-carbon energy intensifies interest group politics might increase the difficulty and cost of deep decarbonization (Sivaram, 2018).

Employment and regional economic development

Coal miners' associations, such as the United Mine Workers of America, are important pro-coal social actors in the United States. These organizations often exert significant POLITICAL influence on legislators, even though the coal industry only represents a small share of the economy. Coal mining and coal electric generation employ a total of 139,785 workers across the country in 2018, with the coal mining and utility generation segment comprising 54% and 17% of them, respectively (Ellis and Fazeli, 2019). In particular, coal mining jobs have decreased from 89,400 at the beginning of 2012 to less than 42,000 as of April 2020 (USBLS, 2020), which is also down from an all-time high of 1 million in 1920. Regarding the demographics of the work force, over 90% of the coal mining labor forces are white, which is significantly higher than that of the national workforce average of 78% (Ellis and Fazeli, 2019).

As of 2015, only 26 counties across ten states are considered coal mining dependent under the Department of Agriculture's Economic Research Service (Morris et al., 2019). Many of these counties depend entirely on coal for the local economy, jobs, and tax revenue used for schools and other social services. In the existing market environment, coal communities across the country have been struggling. These communities have suffered from job loss, environmental degradation, decreasing new investment, limited alternative job opportunities, as well as shrinking local government budget due to the decline of coal, while state and the federal governments have provided very limited support [sr1]. Interviewees pointed out that many coal workers are reluctant to relocate to other places where jobs are growing [sr1, sr2]. Whereas the communities in Wyoming are in a denial stage, local communities in the Appalachia region, which have been dealing with the decline of coal for a much more extended period (since the 1920s) [sr1]. With the help from NGOs, such as the Beyond Coal Campaign of the Sierra Club, some communities have initiated various projects to explore alternative job opportunities and economic development paths [sr1, sr2]. Under the Biden Administration, the federal government incorporates "revitalize coal communities" as one of the targets in the executive order for tackling climate, though the effectiveness of such action remains an open question.

Job losses associated with the decline of coal drive local political support for the Republican Party (Egli et al., 2020). The Trump campaign has been trying to appeal to voters in coal-rich states [r1]. Trump won 19 of the 24 coal producing states in the 2016 election, 17 in 2020. President Trump repeatedly endorsed coal and coal mining companies, calling coal "beautiful" and "clean", and promised communities to bring their coal jobs back. As a useful campaign strategy, Trump associated coal jobs with conservative narratives of the mining industry, which romanticize miners as brave and hardworking men who risk their lives in the mines for their family and the American Dream (Hermwille and Sanderink, 2019, Carley et al., 2018). These narratives also appealed to average Republican voters, who believe in the concept of small government, anti-regulation, and traditional conservative values. Despite Trump's failure to bring back coal, residents of the coal communities expressed appreciation for the political attention even though many of them have well acknowledged the inevitable decline of coal [sr1, pn2, b2].

Conclusions

Based on quantitative data and insights from expert interviews, this analysis provides an overview of the recent evolution of the US coal industry. We identify affordability as the most widely embraced objective within US energy policy making. This objective of minimizing energy costs, combined with technological change in natural gas, wind, and solar, elevated market forces against coal to a prominent position, which lobbying, court cases, and President Trump could not overcome. Under this growing market pressure, the coal mining industry is clearly in retreat, so much so that the vast majority of coal companies have accepted their diminishing role in the energy system. The defeat of the *CPP* was the last successful mobilization by the coal interest groups, with conservative movements and anti-climate groups being the main forces behind it. However, even this success did little to help the industry. Indeed, emissions are on pace to meet the *CPP* target just due to coal losing market share to gas and renewables. While the Trump administration has abolished domestic and international climate policies, it failed to revive the market prospects for coal. The pro-coal policies implemented by the Trump administration have been ineffective and have no tangible impact on the energy market nor – as both our interviewees and the US EIA's forecasts show – have they done anything to improve the future of the industry. Many interviewees point out that coal companies have abandoned their strategies to preserve the market share in the US electricity sector. Instead, they employed different business plans to restructure their companies, exploring potential foreign export markets and the opportunities in metallurgical coal, and seeking government payouts in exchange for shutting down their companies.

To date, the United States is on its way to meet its former climate mitigation pledge under the Paris Agreement. Carbon emissions are expected to decrease by 35% by 2030 even without any federal intervention. Although the United States has cultivated this remarkable decarbonization progress by replacing coal with shale-based natural gas, from a supply-side perspective, fracking additional natural gas is no more than to double-down on the fossil-fuel-fired development path. Even if the United States manages to power its entire economy with natural gas, as a hydrocarbon fuel, natural gas can only provide limited mitigation benefits because targets will soon need to approach zero and because methane leakage from gas infrastructure is coming under increasing scrutiny. Although frequently touted as a bridge fuel, in the United States it has seldom been asked where this bridge will lead, how long it will exist, and to what extent it will compete and delay the expansion of renewables.

It is possible that the US power sector will become increasingly dependent on natural gas for the next 20–30 years. If so, natural gas interest groups would become more deeply embedded in the political and socioeconomic context—in the same way that the coal industry has for the past three decades. If the polarized politics regarding renewable and climate policies were to continue, the natural gas industry would only get increasingly hostile toward renewables, potentially hindering further decarbonization. The political economy of climate policy in the United States will likely continue to be fraught despite the demise of the coal industry.

Appendix

This chapter contains supplementary online material at www.mcc-berlin.net/pecoal/ch06.

Notes

1 For instance, Arch Coal sold some of their thermal coal mines in 2019 and expand metallurgical coal production. In 2020, the company renamed its name to Arch Resource, Inc.
2 BlackRock, the world's largest asset management company, announced that they are divesting from companies driving more than 25% of their revenue from thermal coal.
3 Data from opensecrets.org.
4 CEO of Murray Energy, a private-owned coal mining company. He praised Precedent Trump for his pro-coal rhetoric and regulatory rollback on many media platforms, attracting nation-wide attention.
5 In the United States, the political cleavage between Democrat and Republican politicians on climate- and energy-related issues is salient, making it impossible to pass any national level climate or renewable energy legislation. Senate Republicans can block any climate or clean energy legislation with just 41 votes using filibuster. Senate Republican leader, Mitch McConnell, has repeatedly stated that the Senate would not put any climate legislation to a vote under his watch.
6 Data from the Center for Climate and Energy Solutions. www.c2es.org/document/climate-action-plans/.

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Part II

Established coal users

7 The political economy of coal

The case of China

Cecilia Springer, Dinah Shi, and Aaditee Kudrimoti

Introduction

China exceeds all other countries in annual energy use and greenhouse gas emissions (Sandalow 2018). The carbon intensity of China's economy (i.e. the carbon dioxide emissions per unit of GDP) is also relatively high due to the use of abundant and low-cost domestic coal resources. Given massive domestic coal reserves, China uses more than half and produces just less than half of the world's coal. Therefore, it is by far the world's largest consumer and producer of coal.

The electric power sector is the main destination for coal in China, accounting for 48% of coal use (Zhou et al. 2020). China has a total installed capacity of 2,200 GW (National Bureau of Statistics 2021). In 2020, China generated 7.8 million GWh of electricity, with 56.8% of that coming from coal-fired power plants. Other major end uses of coal include the industrial sector, heating supply, and buildings, which account for 40%, 7%, and 5% of total coal consumption, respectively (Zhou et al. 2020).

As a result of this coal-heavy economy, China is also the world's largest CO_2 emitter. China's annual CO_2 emissions surpassed those of the United States in 2005. More than 70% of CO_2 emissions in the industry and electric power sectors come from coal combustion (Korsbakken et al. 2018).

Most of China's coal reserves are in north, northwest, and southwest China, while demand centers are on the eastern coast (Tu 2011). The coal sector employs about 5 million workers, with Shanxi province having by the far the greatest number of coal-mining workers. Figure 7.1 shows coal-mining employment by province, as well as the gross regional product of each province.

The massive scale and varied geography of China's coal sector play a role in the formulation of the country's energy policies, as do the various actors that engage with the coal sector. As China increasingly commits to low-carbon transformation and energy transition, it is critical to understand the political economy factors that influence the ongoing development of China's coal sector. In addition to pressure from climate goals, another key contextual factor is the overcapacity of coal-fired power generation and other major coal-consuming industries.

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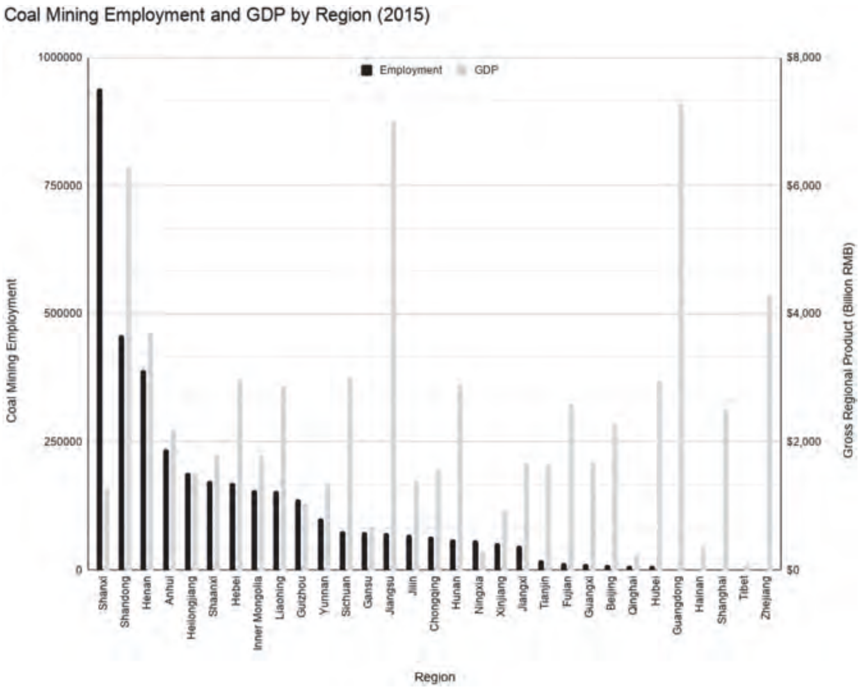

Figure 7.1 Coal-mining employment and gross regional product by province, 2015.
Source: National Bureau of Statistics of China (2019), China Statistical Yearbook (2019), NRDC (2018)

We apply the AOC ("actors, objectives, context") framework developed by Jakob et al. 2020 covered in Chapter 1 to examine the contemporary political economy of China's coal sector. This framework addresses three key research questions: what are the objectives present in China's energy policy domain? What actors represent these objectives? How do the socioeconomic, political, and institutional contexts shape these objectives? Following this framework, we conducted a literature synthesis on the political economy of China's coal sector to identify the relevant actors, objectives, and contextual factors. We began the literature review by focusing on studies that develop theories of political economy for China's coal sector, energy policy, and climate policy and deepened the review by searching for empirical studies with primary quantitative and qualitative data on China's coal sector, as well as reviewing Chinese policy documents. The literature review was supplemented with key expert interviews to verify and extend our synthesis of the information based on informational gaps in the literature review, such as the current state of carbon capture and sequestration technology and policy; the link between domestic coal overcapacity and overseas industrial policy; and the role of industry groups in coal policymaking. We identified and interviewed seven experts between January and November 2020, based on their known expertise in subject areas we were seeking to improve our information on and a snowball approach through our networks. We included notes from these interviews as primary information to supplement our synthesis approach.

Key actors

Policies that govern the coal sector emerge from a complex set of interplaying objectives on the part of a diverse set of actors (Jakob et al. 2020). In this section, we divide the actors that engage with China's coal sector into political and societal actors, describe their main functions, and outline the ways in which they influence policymaking.

Political actors

The Chinese Communist Party (CCP) is the sole governing political party of the country, setting national strategies for economic development and, in recent years, a rhetoric of environmental protection. Coal has played a key role in fueling industrialization throughout the various phases of China's economic development. Under Mao, coal was a core industry with well-paid workers and low, controlled prices that were meant to boost industrialization with cheap fuel inputs. Over the next few decades, national leaders' strategy of promoting reform and dualism meant that coal production was bifurcated into small township and village coal mines (TVMs) that sold coal on a market basis, and state-owned enterprises (SOEs) with a regulated price system. Since the Reform and Opening Up era beginning in 1978, the government has pursued a market or capitalist approach to coal production, but this has come into tension with the electricity generation industry, for which reform and deregulation is ongoing (Wright 2012). Under Hu Jintao and Xi Jinping, a prominent rhetoric of ecological civilization (*shengtai wenming*) has been promoted to unite the goals of economic development and environmental sustainability, and this high-level commitment to environmental protection has led to increasingly stringent regulation of the coal industry. The specific actors that implement and enforce these high-level strategies and goals are discussed below.

National Development and Reform Commission (NDRC)

The National Development and Reform Commission (NDRC) is a super-ministry that sits a half rank above China's other ministries, responsible for broad development and economic planning. The NDRC prepares China's national Five-Year Plan and sets national benchmark prices for a range of commodities, including coal and oil. In 1998, the former Ministry of Coal was phased out and its functions transferred to the NDRC (Peng 2009). The NDRC has the power to set energy pricing and to review and approve infrastructure projects throughout China as well as overseas.

National Energy Administration (NEA)

The National Energy Administration (NEA) is an independent agency within the NDRC in charge of energy planning and policy coordination. The NEA studies and drafts energy development strategies, implements policies in industrial sectors, and is responsible for promoting energy efficiency. For example, the NDRC and NEA created the risk warning system for coal-fired power plants in 2016, effectively restricting which provinces could construct new coal plants.

Ministry of Ecology and Environment (MEE)

The Ministry of Ecology and Environment (MEE) is responsible for developing, implementing, and coordinating China's climate change policies. Notably, it is responsible for establishing the national carbon trading system and, with the NDRC, developed China's first nationally determined contributions (NDC) for the Paris Agreement on climate change. Formed in March 2018, this body consolidated environmental responsibilities formerly spread across a number of ministries, including climate change and emissions reduction policies formerly under the NDRC. Its formation elevated environmental policy to equal status with economic policies, represented by the agency being at the same level as the NDRC and other ministries in reporting directly to the State Council. However, being a new body without the historical influence of the NDRC, the MEE has a lower rank in China's cabinet hierarchy and less power over Five-Year Plans and sectoral policy. In energy and climate policy, the lead agency remains the NDRC.

Subnational government

State organization is paralleled at all levels of government, with provincial and municipal DRCs exercising powers on behalf of local government. Provincial benchmarking price-setting is informed by national benchmarks set by the NDRC. Similarly, national climate targets are implemented in part by assigning targets to provinces, with provincial and local leaders accountable for achieving them. As such, subnational governments, including provincial and municipal officials, have significant power to set the local climate policy agenda. Failure to achieve environmental targets became a potential barrier to promotion for officials for the first time in the 11th Five-Year Plan (2006–2010), although economic targets remain the most important metric for promotion evaluation (Sandalow 2018). These competing incentives were tested from 2014 to 2016, when new coal plant approval was transferred from central government to the provincial level, leading to 210 project approvals in the span of a year, even as demand declined (Myllyvirta 2020).

State-owned Assets Supervision and Administration Commission of the State Council (SASAC)

State-owned Assets Supervision and Administration Commission of the State Council (SASAC) supervises and manages SOEs, including China's large power companies and oil and gas companies. SASAC has the power to appoint, evaluate, and remove executives of the enterprises it supervises, and it can also restructure and reorganize these enterprises in support of policy goals. Although SASAC can integrate and restructure SOEs, it has limited direct influence over energy policy.

State-owned enterprises (SOEs)

The Chinese government retains control over "strategically important" industries, including energy via SOEs. These can have national or subnational ownership and employ some 61 million people as of 2018 (Hart et al. 2019). While not directly involved in policy formulation, some SOEs play an important role in informing state investment decisions. For example, many SOEs receive state financial support to develop low-carbon technologies, which informs policymakers as to what is technologically and economically feasible. Many national SOEs have quasi-regulatory authority through their ability to adopt rules governing operations, a legacy of prior status as state bodies before corporatization. A revolving door of top executives and bureaucrats among SOEs and government agencies ensures strong lobbying influence and a conflict of interest between the regulator and regulated. Subnational SOEs are local governments' most significant tax revenue source with taxes collected accounting for approximately 90% of local revenue (Hart et al. 2019). Combined with their ability to choose where within China to operate, SOEs have strong influence over local policy. Examples of SOEs that play a major role in the coal sector are the so-called Big Five electric power generation companies, which SASAC has increasingly consolidated over the years. China Energy Investment Corporation (CEIC) is China's largest power producer. It operates in eight business segments, including coal mining, thermal power, transportation, and clean energy. CEIC owns China Shenhua Energy Co. Ltd, the world's largest coal company. Shenhua first emerged as an SOE directly administered by the State Council in the 1980s and steadily increased vertical integration in the coal sector until SASAC merged it with CEIC in 2017 (Peng 2009). The other major SOEs that round out the "Big Five" are Datang Group, Huadian Corporation, Huaneng Group, and the State Power Investment Corporation.

Societal actors

Private coal companies

The private coal sector is significantly smaller than SOEs, to the point of not being competitive domestically, especially after continued consolidation of

SOEs. The majority of private business streams are moving to international projects. For example, China Kingho, the largest private coal-mining company in China, has projects in Mozambique, Sierra Leone, and Pakistan.

Expert organizations

These include Chinese academies, such as the Chinese Academy of Science, and top national universities, particularly those in Beijing with access to government officials. These are supported by government funding sources but operate relatively independently and openly. They influence policy through their expertise and ability to inform and legitimize political and economic positions. In addition to academic organizations, there are several quasi-governmental research institutions that also provide research and analysis support that informs the development of Chinese energy and climate policy. These include the National Center for Climate Change Strategy and International Cooperation (NCSC, founded under NDRC and transferred to MEE), the Energy Research Institute (ERI, part of NDRC), and more.

Major coal-consuming industries

End users of coal in China, like the iron and steel industry, have historically benefited from low coal prices. These industries will be affected by various coal-related policies, including the coal cap, emissions regulations like China's emissions trading system (ETS), and China's carbon neutrality target.

NGOs

These can be divided into three categories: government-sponsored NGOs, grassroots NGOs, and international NGOs. Roles include government engagement and raising public awareness. Government-sponsored NGOS, sometimes known as government-organized NGOs (GONGOs), have the most policy influence, but all face a restricted political space. During the mid-2000s, most pollution-related civil society activity was directed by state-sponsored or state subcontracted nonprofit organizations, which served as an extension of the CCP's policy research institutions (Chen et al. 2013). GONGOs are not independent from the state, nor are they deeply connected to grassroots movements, and thus usually abstain from "radical confrontation" with or explicit protest against the national government (Fei 2015). The first set of Chinese environmental GONGOs emerged during the first phase of Deng Xiaoping's Reform era. In 1979, the government sponsored the Chinese Society of Environmental Science (CSES), a GONGO that established a framework wherein the public could "openly" discuss environmental issues and policy solutions with CCP authorities. Today, NGOs are not officially consulted in the construction of NDCs and price-setting but may have influence through relationships with expert organizations. A handful of domestic NGOs are actively advocating for decreased coal use in China. A number of international NGOs have offices in China and pursue similar advocacy goals, including the Natural Resources Defense Council, the World Resources Institute, and Greenpeace. However, international organizations are subject to increasingly strict oversight.

Objectives

In recent years, several trends have emerged in China's coal industry, including massive overcapacity of coal-fired power generation, the facilitation of coal power developers going abroad via the Belt and Road Initiative, a high-level commitment to emissions reduction and clean energy transition within China, and ongoing issues with provincial-to-national economic and environmental reporting. These clear trends reflect a diverse set of objectives on the part of the actors discussed above.

In this section, we identify and cluster the objectives of the above actor groups into several themes: economic development, economic reform, and clean energy and environmental governance. Each of these objectives exerts different pressures on decision-making for China's coal sector.

Economic development

Economic growth is the foundation of the Chinese government's political legitimacy. Since the Reform and Opening Up era, China has seen rapid economic development, a subsequent growth in the middle class, and a rise in energy consumption. China's economic growth has been driven by coal as its dominant source of both primary energy and electricity supply. In 2011, China became the world's second-largest economy, with its GDP at US$7.2 trillion.

However, as economic growth in China slows, there is a growing gap between the growth rate of installed coal capacity (7.8%) and electricity demand (0.5%) (Ming et al. 2017), a problem referred to as overcapacity. By some estimates, China has around 200–260 GW of excess coal capacity (Yuan et al. 2016). Since 2017, the NEA has canceled more than 200 GW of planned coal-fired power generation capacity, yet more projects continue to be approved, even in 2020.

This severe overcapacity issue has been driven by a mandate for economic development. At a broad scale, China's coal overcapacity problem is a result of the need to maintain massive flows of capital investment that signal economic growth in a political sense. Incentive structures for local governmental officials to promote rapid economic development have been in place since the early Reform era. Major investment in electricity supply was needed to meet booming energy demand that began in the 2000s, and coal was seen as a pillar for domestic energy security. Incentives for local officials included policies like national subsidies for manufacturing to stimulate local growth and personal incentives for local leaders (i.e. CCP recognition and promotions to national government). Investment in coal mines and coal-fired power plants directly boosted provincial GDP. Coal was particularly favored over other energy sources because many local government officials were also on company boards of manufacturing companies and SOEs for coal production that operated in provinces or municipalities that they governed (Rogers and Vogel 2018).

Today, coal-fired power plants continue to be seen as a familiar and reliable investment within China for provincial economic planners. Overcapacity has been driven not by energy security concerns, but by a policy shift. In 2014, the approval authority for coal power projects was decentralized and shifted from the central government to local governments, and approval time was shortened (Ren et al. 2019). Provincial-level government officials have traditionally been evaluated by the central government based on economic performance. With project approval for coal-fired power plants decided upon at the provincial level, provincial governments have an incentive to keep approving coal plants even when the capacity is not needed (Feng et al. 2018). In addition to misalignment between national policy and local interests, our literature review also finds that overcapacity is attributed to misguided regulatory practices that guarantee rates of return for coal plants, timing misalignment in the adjustment of regulated prices for coal and electricity, and mistaken assumptions about the economy.

This excess capacity is not unique to the coal sector – many other coal-intensive industries, such as steel and aluminum, also face domestic overcapacity due to years of rampant and uncoordinated investment, which has driven continued high demand for coal. This overall industrial overcapacity represents enormous investment waste, low returns for many individual plants, and difficulty in achieving environmental targets. However, through industry groups, China's coal enterprises continue to promote coal as essential to energy security and power system reliability in order to maintain their market share.

The high-level mandate to continue economic growth also means delivering continually rising living standards for Chinese citizens, especially via the labor market. Traditionally, employment in China's coal-mining sector provided well-paid but dangerous jobs for millions of workers, peaking at over 5 million workers in coal mine enterprises in 1990 (Wright 2012). As China manages a transition to clean energy, there will be significant effects on workers employed in the coal industry, a major issue for other coal-producing countries considering energy transitions such as India, the United States, and Poland. The negative effects of closing unneeded coal plants and coal mines have also disproportionately affected the poorer interior provinces and workers in less urban areas (Hao et al. 2019). Additionally, other coal-capacity-cut programs resulted in unemployment and regional economic decline (Shi et al. 2018). These effects are of concern to central government leaders in terms of how they might affect economic development in relation to political stability, given the entrenched political power of the coal industry and the importance of avoiding mass unemployment in key regions.

The contribution of the coal sector to China's economic development also hinges on the trajectory of China's renewable energy industry as an alternative to coal power. China's domestic solar and wind manufacturers are competitive on a global stage, and equipment export has been a major growth area for domestic renewable energy companies. China's domestic renewable energy target and other climate policies will also create a favorable policy environment for increasing installation of renewable capacity. Renewable energy companies tend to be private companies operating on a much smaller scale than the traditional SOEs that are involved in coal mining and coal power development, which has meant they have not wielded the same political power. However, the major SOEs are increasingly getting involved in renewable energy development as part of an asset diversification strategy. In addition, given China's ambitious climate policies, SOEs are receiving pressure from the national government to innovate in technologies besides renewable energy that enable low-carbon industry, including energy storage, ultrahigh voltage transmission, smart grids, and carbon capture and storage (CCS). CCS can be paired with coal-fired power generation to significantly reduce CO_2 emissions and may be of particular interest to SOEs now facing competing objectives of ensuring that their existing coal projects do not become stranded investments while also meeting carbon reduction targets. These SOEs continue to hedge on coal by supporting other technologies that can prolong coal's high market share, like coal-to-gas development.

Box 7.1 The Belt and Road Initiative, economic development, and coal

The Belt and Road Initiative (BRI) is portrayed as an important new model for global economic development, led by China (Hofman and Ho 2012), but it also facilitates further economic opportunities for Chinese firms in overseas markets. The BRI strategy helps Chinese companies access new markets, maintain profitability, and solve the issue of industrial unemployment and slowing growth within China (Inskeep and Westerman 2019). Domestic coal plant technology developers have benefited from China's involvement in coal plant development overseas (Shearer et al. 2019). Demand for coal power development in BRI host countries has driven financing for overseas coal power plants from China's policy banks (Gallagher et al. 2021). China's involvement in overseas coal power has led to significant backlash from international NGOs and Western development finance institutions due to the climate and environmental impacts of a lock-in of coal infrastructure.

Economic reform

From a political economy perspective, it is important to distinguish between economic development and economic reform in China, although both processes are inextricably linked. Economic reform refers to the transition in economic structure and management that has taken place over the past few decades in China, and which continues to be a major goal of economic policymakers. In the late 1970s and 1980s, China's Reform and Opening Up process was remarkably "unplanned" in the sense that it lacked a preordained, top-down structure. The reforms occurred through a dual-track system that allowed coexistence of the traditional planned economy as well as a market channel at the firm level (Naughton 1995). Yet the reforms did not eliminate planning altogether. From the 1990s onward, Chinese planning changed in its nature, becoming more of an iterative, responsive coordinating mechanism rather than an overall command system (Heilmann and Melton 2013). China's efforts to partially transition to a market economy have had significant implications for the coal sector. Both large, national coal-mining SOEs as well as smaller TVMs struggled with the transition to a market economy (Wright 2012). TVMs, which were allowed to transition to a market pricing system, received the bulk of criticism related to the environmental and social costs of coal mining, while SOEs struggled with mandated low coal prices that reduced incentives for investment and efficiency. Over time, as reform has continued, power over the coal-mining industry has increasingly consolidated within the national SOEs (Peng 2011). In recent years, the geography of China's coal production has been driven in part by a "strategic westward movement" promoted by the central government in order to further consolidate resources in larger firms and upgrade production (Woodworth 2015).

In addition to coal production, the electric power sector has been a target for reform and marketization since 2015. The electric power sector is the main destination for coal in China. The main goals of reform are to increase generation efficiency, decrease consumption and pollutant emissions, develop renewable energy, and decrease industrial electricity prices (Guo et al. 2020, Victor and Heller 2007). In China, residential electricity prices are heavily subsidized, in part to maintain social and political stability. However, industrial electricity prices are higher than those of most developing countries and even some developed countries. Premier Li Keqiang set a goal of reducing the price of industrial and commercial electricity by 10% in 2018, 10% in 2019, and 5% in 2020 (Li 2018, 2019, 2020). Prior to 2015, the sector operated in a single purchasing agency model where one grid company (State Grid or the Southern Power Grid) purchased electricity from generator companies and sold to consumers at regulated prices. Under this model, wholesale electricity markets were not competitive in structure, meaning that the marginal cost of producing electricity did not determine the electricity price or the dispatch order for power generators (Kahrl et al. 2013). Low-cost renewable energy has often been curtailed due to system balance concerns and limited transmission capacity despite being legally prioritized in transmission and distribution by the NEA. This has slowed a transition away from coal-fired power generation. In 2015, new reforms were introduced to enhance market-based competition by creating competitive wholesale and retail markets. As of 2018, all provinces in mainland China have established power exchange centers to support market-based electricity transactions. On top of these provincial markets, six regional power markets exist for interprovincial transmission. Interprovincial and interregional transmissions remain low as they face hurdles, including low density of connections between networks and highly diverse market models across jurisdictions (Guo et al. 2020).

These reform efforts embody a contradictory logic wherein policymakers claim to want competition, foreign investment, and privatization while still setting prices, limiting foreign ownership, and keeping state-owned power generation companies in the hands of small political networks, especially those with vested interests in coal power (Yeh and Lewis 2004). In particular, the long-term tension between coal production and coal-fired electricity generation, referred to as *mei dian zhi zheng*, continues. Given low residential electricity prices, electricity generators seek low-cost fuel inputs, while coal producers desire a higher price for their product. This tension has led to increased vertical integration of the coal sector, without resolving the underlying economic contradictions.

Clean energy and environmental governance

In recent years, a number of policies have been set forth in order to regulate the environmental impacts. The State Council issued the Energy Development Strategy Action Plan in 2014, which set a target for national coal consumption at 4.1 billion tons per year by 2020, which many experts agreed was not a particularly stringent cap, given a plateau in coal consumption at around 3.7–3.8 billion tons per year beginning in 2013. However, regional coal consumption caps are more stringent. In 2016, the NDRC and NEA released guidelines that required 13 provinces and regions with growing coal overcapacity to halt approval of new coal projects. The NEA also established a warning system that evaluated risk of overcapacity for provinces and led to the cancellation of dozens of plants in provinces deemed high risk (Lin et al. 2016).

The 13th Five-Year Energy Development Plan, released by the NDRC in 2016, set a target for coal to provide no more than 58% of primary energy by 2020. In 2017, the NDRC announced a new limit on total installed coal-fired generation capacity of 1,100 GW. At the same time, there are a number of environmental laws and plans that regulate the coal sector, such as the State Council's 2013 Air Pollution Prevention and Control Action Plan, the 2015 Environmental Protection Law, and the 2017 Environmental Protection Tax Law. The national ETS will regulate CO_2 emissions in the form of a tradable performance standard that will be first applied to the power sector, and eventually expand to other major emitting sectors that will account for over half of China's CO_2 emissions (Goulder et al. 2017). While not a traditional carbon price that would directly increase the cost of coal for end users, depending on a number of policy design features, the national ETS could incentivize deployment of lower carbon fuel sources in regulated sectors, especially if pursued in tandem with sectoral reform and marketization efforts (Myllyvirta and Slater 2021). Table 7.1 summarizes the key energy and environmental policies regulating coal sector.

Table 7.1 Key energy and environmental policies affecting China's coal sector

Policy	*Description*	*Implementing agency*
Air Pollution Prevention and Control Action Plan	Called for elimination of small coal-fired boilers, energy efficiency standards for large coal-fired boilers, and steps to address air pollution from coal	State Council
Energy Development Strategy Action Plan	Capped national coal consumption at 4.1 billion tons per year and 62% of primary energy mix by 2020	State Council
13th Five-Year Energy Development Plan	Capped national coal consumption at 4.1 billion tons and 58% of primary energy by 2020	NDRC
National CO_2 emissions trading system	Tradable performance standard first applied to the power sector, to eventually expand to other major emitting sectors	MEE
Top 100, 1000, and 10,000 Energy-Consuming Enterprises Program	Companies in the program are required to meet energy consumption reduction targets. Specific targets are based on annual energy consumption	NDRC
Carbon Neutrality by 2060	Peak CO_2 emissions by 2030 and achieve carbon neutrality by 2060. Peak coal consumption by 2025	NDRC
Regional coal consumption caps	Early warning system for controlling overcapacity. Tightened control of coal power expansion by region, ordering construction projects to be slowed down, postponed, or canceled	NDRC, NEA
14th Five-Year Energy Development Plan	13.5% reduction in energy intensity and 18% reduction in carbon intensity in 2021–2025 period. Coal cap expected to be announced late 2021	NDRC

Coal drives the high carbon intensity of China's economy, although major energy efficiency policies have reduced the carbon intensity of the economy significantly in the past decade. In the past ten years, China's central government has committed significant political will and resources to developing clean energy technology and policy aimed at reducing greenhouse gas emissions. From the 11th Five-Year Plan (2006–2010) onward, binding energy efficiency and emissions intensity targets have been put forth in China's Five-Year Plans. China has also made voluntary energy and emissions commitments in other high-level policy venues, such as the UN climate negotiations, where these targets were formalized in their Intended Nationally Determined Contributions (INDCs). Most recently, China committed to carbon neutrality by 2060, as well as peak coal consumption by 2025 at the Leaders Summit on Climate in

April 2021. Given the global nature of climate change, China's greenhouse gas emissions reduction efforts reflect an increasing desire to demonstrate global leadership and enhance international soft power.

However, nationally guided emissions reduction efforts are frequently stymied by the inability to gather accurate data about province-level activity, especially in the coal sector. China has faced past challenges in energy and emissions reporting since the mid-1990s (Sinton 2001). In 2015, the National Bureau of Statistics was accused of underreporting coal consumption by around 17% (Buckley 2015). In 2012, independent researchers found a massive discrepancy between national and provincial datasets on energy use in China. This discrepancy ultimately stemmed from small coal producers that only reported to provincial authorities, as well as systematic underreporting from provincial to national authorities (Guan et al. 2012), reflecting conflicting objectives between national and local actors. In light of this discrepancy, the national government recently updated historical statistics (Zhang et al. 2019).

In addition to climate-motivated regulation of coal in China, Chinese policymakers are also extremely motivated by air pollution associated with coal combustion. Public awareness in China has increasingly recognized that air pollution like sulfur dioxide, nitrogen dioxide, and particulate matter (PM2.5) associated with coal combustion can induce life-threatening diseases (Bronshtein 2018). Research has shown that people in northern China have a significantly lower life expectancy due to air pollution from coal-burning for municipal heating (Chen et al. 2013). Increasing awareness of these issues catalyzed a surge in environmental protests in China over the last decade (Hoffman and Sullivan 2015). This was also enabled by widespread economic growth and a growing middle class following the Reform era, leading to a "Not In My Backyard" or "NIMBY" phenomenon (Olesen 2014) (Liu 2013). While the Chinese public generally supports government-led climate action, air pollution has dominated public concern about risks associated with climate change (Li 2018).

Growing public awareness has highlighted the government's objective of maintaining social stability, evidenced by significant policy responses to air pollution from coal combustion, especially in wealthier, heavily populated cities like Beijing. Within specific cities, there is ongoing debate about whether this air pollution is more attributable to transportation emissions or coal combustion. Since the latter has proved easier to regulate, many industrial activities have been shut down and, in some cases, relocated out of the large, wealthy cities. These activities included coal burning for municipal heating in the winter, coal-fired power plants, and manufacturers directly using coal for production. In fact, Beijing has entirely eliminated coal-fired power plants. The municipal government has also promoted switching from coal to natural gas for the manufacturing sector since 2013 and for rural heating since 2017, significantly reducing air pollution in the area. However, urban air pollution regulation has led to concern about environmental justice, as coal-fired power generation and industrial coal use have moved to poorer Western and interior provinces.

It is important to note the differences in local- and national-level policy responses. Local episodes of air pollution have driven national policy. Following an acute episode of severe air pollution in Beijing in 2013 that attracted significant attention, including from international media, the State Council has issued edicts that curb polluting industries (Wong and Karplus 2017). At the same time, air pollution-related protests have not been suppressed by the CCP because they primarily target the inefficiencies of local governments. Protests highlighted local governments' failure to enforce national environmental policy, thus supporting the central government's environmental protection reform agenda (Kroeber 2013). Since 2012, however, there has been an increase in civil society activity on environmental issues directed toward the national government (Standaert 2017). The middle class creatively shifted its subject of protest from local government to the federal government using media. For example, documentaries like Chinese journalist Chai Jing's "Under the Dome" analyzed the effects of air pollution on Chinese citizens and exposed the inefficiencies of national environmental policies, serving as an implicit rebuke to both local and federal government officials who failed to manage polluters. The viral popularity of "Under the Dome" within China led authorities to aggressively block the film on the Chinese internet (Standaert 2017). In addition to internet-based censorship and increased monitoring of conversations regarding the subject on social media websites like Weibo, street protests were also suppressed.

Discussion

This study adds to a prevailing thread in the literature on the political economy of China's coal sector that the outcomes of various policy targets for China's coal sector are defined by the interplay between local and national actors. The overarching objective of economic development has led to massive coal overcapacity as provincial governments retained the power to approve and develop coal-fired power generation, even as national actors have increasingly prioritized environmental protection and global climate cooperation. This trend is reflected in the difficulty in establishing accurate data regarding coal consumption at the provincial level, the difficulty in establishing a legal framework for regulation of local polluters, and other aspects of environmental governance in China.

Another major finding is the importance of recent consolidation of coal-related SOEs in driving many trends in the coal sector. Economic reform, an ongoing process in China, has increasingly shifted economic and political power in China's coal production toward SOEs and away from smaller companies. These SOEs have increasingly moved toward vertical integration across coal production, transport, and electricity generation, while also expanding into various clean energy technologies given pressure from national-level targets to decarbonize. These SOEs face challenges of domestic overcapacity in a number of sectors, which also motivates their technological diversification. At the same time, a partially reformed power sector, dominated by just a few SOEs,

Table 7.2 Key actors and objectives in China's coal sector

Societal objectives	*Societal actors*
Sustain economic growth	Private coal companies
Affordable and reliable energy	Expert organizations (e.g. CSA, NCSC)
Employment	Coal-consuming industries
Reduce air pollution	NGOs
Climate change mitigation	
Political objectives	*Political actors*
CCP political legitimacy	State Council
Promotion to higher levels of government	NDRC
Economic development	NEA
Economic reform and marketization	MEE
Address industrial overcapacity	Provincial and municipal DRCs
Increase global leadership and soft power	SASAC
	SOEs

continues to give preference to coal-fired power generation, which drives further overcapacity. We summarize the key actors and objectives discussed in this chapter in Table 7.2.

Overall, we surmise that despite high-level commitments to low-carbon energy and peaking coal consumption, China's coal industry will be slow to transform. International criticism is largely ignored as China increasingly positions itself as a climate leader. The economic effects of the COVID-19 pandemic have thus far demonstrated that Chinese policymakers are favoring the traditional model of economic development via rapid infrastructure build-out, evidenced by a spate of coal plant approvals representing 40 GW of capacity in the first half of 2020 alone (Myllyvirta 2020).

A clean energy transition in China will largely depend on the ability of the national government to successfully implement its 2060 carbon neutrality agenda through control of SOEs and local government. Through scenario modeling, Tsinghua's Institute for Climate Change and Sustainable Development found that coal would need to make up less than 10% of the energy mix by 2050 to achieve the global 2°C target and less than 5% to achieve net-zero emissions (He 2020). Market-based policies like the national ETS can play a role in this transition, if power sector reform is successfully managed. China is also well-poised to benefit from energy transition by supporting domestic renewable energy and clean technology developers, including both private firms and increasingly diverse energy SOEs. Given the increasing priority national government actors are placing on environmental protection, climate policy, and clean energy, it is critical to continue to explore how the political economy of Chinese coal actors, their objectives, and contextual factors will shape the ability of the national government to achieve its agenda.

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8 The political economy of coal in India

Evidence from expert interviews[1]

Lorenzo Montrone, Nils Ohlendorf, and Rohit Chandra

Introduction

Why does India rely on coal in the power sector? Economic and technological reasons alone cannot explain the large pipeline and the existing plants. The price of renewable energy (RE)[2] in India has reduced dramatically (Creutzig et al., 2017), and recent RE projects are cheaper than many existing coal power plants (Somananthan & Chakravarty, 2019). In addition, the health effects caused by local air pollution arising from power generation based on coal are substantial: coal combustion was responsible for almost 170,000 deaths in 2015 (GBD MAPS, 2018). This chapter analyzes the political factors that contribute to explaining the power sector developments.

Most of the literature focuses on the uptake of REs in India (e.g., Isoaho et al., 2016; Krishna et al., 2015; Ramamurthi, 2016; Shidore & Busby, 2019; Tagotra, 2017; Tongia, 2007), but only a few studies investigate the political drivers of coal in the power sector. Tongia & Gross (2019) find that coal mining is central to India's political economy because it is an essential revenue source for the Central government, the state governments, and state-owned enterprises, such as Indian Railways, the largest employer in the country (Kamboj & Tongia, 2018). Worrall et al. (2018) identify all government policies incentivizing the use of coal in the power sector.

We conducted semi-structured interviews with 28 energy experts and policymakers in Delhi. Using the "AOC" (actors, objectives, context) framework by Jakob et al. (2020) covered in Chapter 1, we systematically coded the interviews to classify actors, objectives, and contextual factors that influence coal-related policies. We cluster our results around three overarching objectives: providing sufficient and cheap electricity supply, promoting domestic industries and personal interests, and mitigating air pollution and climate change.

We find that India's focus on coal is driven by direct government intervention in the power sector to secure long-term electricity supply. Public sector undertakings (PSUs) along the coal supply chain are used to create regional employment and prosperity and strong vested interests also exist. Environmental concerns are more important now than in the past, but not significant enough to overcome powerful incumbents in polluting sectors such as coal generation.

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The remainder of the chapter is structured as follows. The "India's power sector" section describes the structure of the Indian power sector. The "Methodology" section describes our research design, while the "Results" section extensively describes our findings. We discuss broader implications for an Indian energy transition and conclude in the "Discussion and conclusion" section.

India's power sector

The Indian power sector is governed by several ministries, associated PSUs, and government agencies. Figure 8.1 shows the organization of the Indian power sector and how it relates to coal mining, transport, and manufacturing of power plants.

The Central government has to approve most energy policies. Within the Central government, the Prime Minister Office (PMO) has a special role, as it decides the most important policy issues. Subordinate to the PMO are multiple specific ministries, which regulate different segments of the sector, but require the PMO's approval for changes in regulations.

The Ministry of Coal is responsible for the production, supply, distribution, and pricing of coal and implements its regulations directly through the quasi-monopolist PSU Coal India Limited (CIL). Coal in India is transported via railways that are managed by the Ministry of Railways and operated by the PSU Indian Railways. Bharat Heavy Electricals Limited (BHEL), an engineering and manufacturing PSU under the Ministry of Heavy Industries, manufactures products for the power sector, such as turbines and boilers for thermal power plants and transmission lines. The Ministry of Power is in charge of the planning, policy formulation, and enactment of legislation concerning thermal and hydropower generation, transmission, and distribution. Furthermore, through the PSU National Thermal Power Corporation Limited (NTPCL), it controls 16% of the power capacity of the country. The Ministry of New and Renewable Energy regulates wind, small hydro, biogas, and solar power. Since 2014, it has been headed by the same minister as the Ministry of Power. Finally, the Ministry of Environment, Forestry, and Climate Change (MoEFCC) enacts environmental regulations and approves environmental clearances for power projects and new mines. However, these regulations are often not binding or weakly enforced by other ministries and PSUs (Stuligross, 1999).

Apart from the Central government, governmental agencies, state government, and the judiciary also influence the power sector. The Central Electricity Authority (CEA) advises the Ministry of power on development plans for the electricity sector. The Central Electricity Regulatory Commission (CERC) defines the guidelines for the Power Purchase Agreements (PPAs) between power generation companies and distribution companies (DISCOMs). NITI Aayog is a governmental think tank in change of facilitating cross-ministerial cooperation. The state governments are responsible for fostering electrification and also have the largest influence on electricity distribution as they own

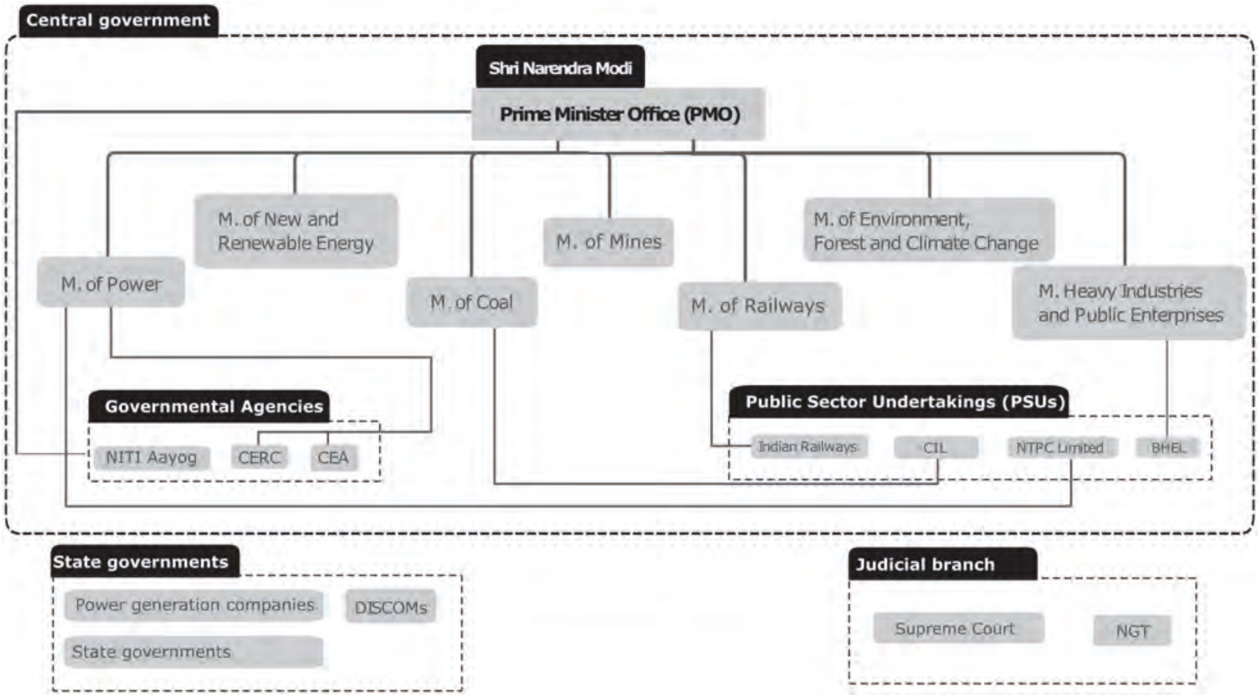

Figure 8.1 Power sector.

Note: CERC = Central Electricity Regulatory Commission, CEA = Central Electricity Authority, CIL = Coal India Limited, NTPCL = National Thermal Power Corporation, BHEL= Bharat Heavy Electricals Limited, DISCOMs = Distribution Companies, NGT = National Green Tribunal.

most DISCOMs. Finally, the Supreme Court and the National Green Tribunal (NGT) have been of particular relevance in the power sector by deciding about pollution regulation.

In recent decades, India's power sector has been through a number of reforms that have led to the liberalization and rapid expansion of total installed capacity (Figure 8.2). The power sector was liberalized in 2003 with the Electricity Act, which lead to a sharp increase in power capacity additions, mostly from private investors. As of 2020, there are 228 GW of operating coal-fired power capacity (Shearer et al., 2020), generating 74% of total electricity. Since 2015, the government intensified its efforts to promote REs: it increased the national RE target to 175 by 2022, approved more stringent pollution regulations for thermal power plants, increased Renewable Purchase Obligations (RPOs) from 3% in 2006 to 8%, and adopted a program to improve the financial situation of DISCOMs. As a result, the RE capacity has increased substantially. In 2020, wind and solar capacity made up, respectively, 10% (38 GW) and 9.5% (36 GW) of the total installed capacity (CEA, 2020).

The sharp increase of coal capacity led to a situation of oversupply. However, the quality of electricity for Indian households remains low, as DISCOM's large budget deficits prevent them from serving all consumers. The dire financial situation of DISCOMs results from a long history of politically set electricity tariffs, allowing theft and unmetered consumption (Dubash et al., 2018).

Methodology

Our main data sources are semi-structured expert interviews that we complement with extensive desk research. In total, two authors conducted 28 semi-structured expert interviews in October and November 2018. The sample selection followed a snowballing process (O'Reilly & Parker, 2013). The final sample of 28 interviews includes at least one representative of most key actors in the Indian power sector.[3] We interviewed twelve experts from national societal actors (nsa), including research institutions, journalists, and nongovernmental organizations, ten experts from national political actors (npa), including ministries and regulatory agencies, three experts from public-owned enterprises (pea), two experts from international societal actors (isa), and one expert from a privately owned enterprise (prea). In the remainder of the chapter, each interviewee is referenced by the type of actor plus a random number that has been assigned to each interview (e.g., nsa1).

Our semi-structured interviews followed an interview guideline that consisted of three parts. The first part asks which are the most important power sector policies, the second part which actors are relevant for political decisions, while the third part identifies contextual factors and asks follow-up questions. We clustered our results under three main overarching objectives, namely (i) provide sufficient and affordable electricity supply, (ii) promote domestic industries and personal interests, and (iii) mitigate air pollution and climate change. These objectives reflect the energy trilemma and are commonly

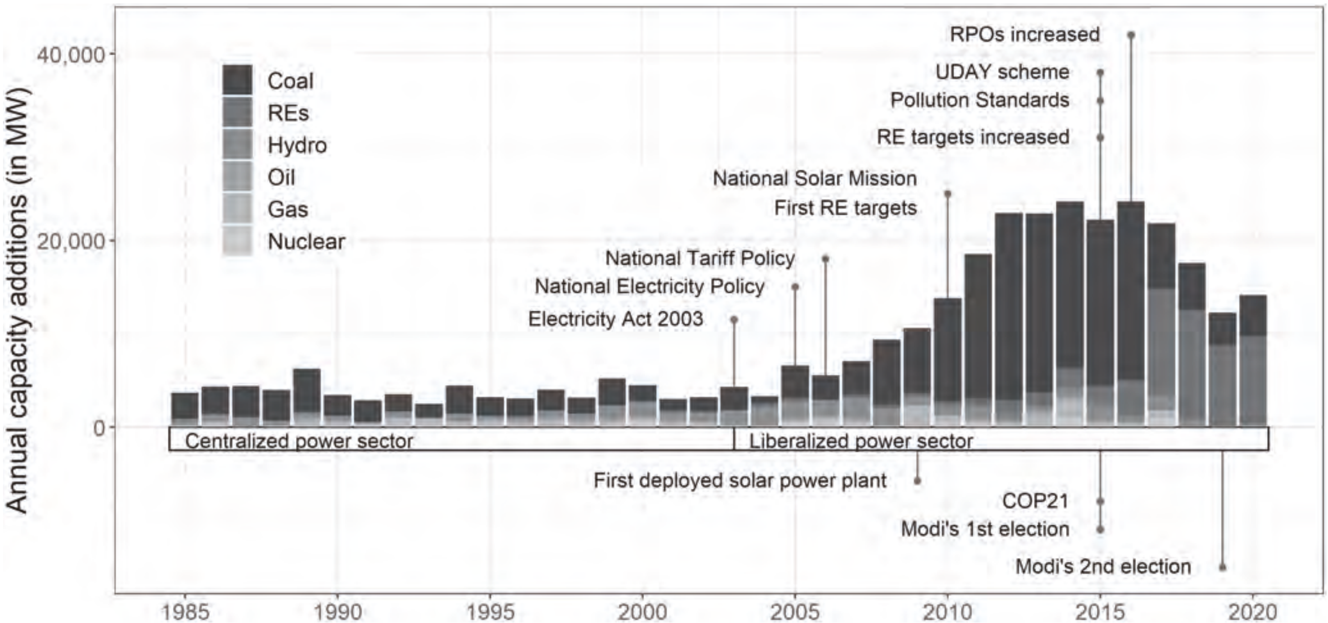

Figure 8.2 Annual capacity additions by source (including a timeline of relevant events).

Note: RPOs = Renewable purchase obligations, UDAY = Ujjwal DISCOM Assurance Yojana.

Sources: PLATTS (2017) until 2016. CEA (2020) until 2020.

identified in the energy transition literature as important (e.g., Jenkins, 2014; Schmidt et al., 2019). Each result section describes in detail how objectives and actors interact to explain India's reliance on coal in the power sector. Further information on the institutions covered and on the qualitative analysis of the interview material can be found in the online appendix.

Results

Provide sufficient and affordable electricity supply

Ensuring a sufficient and affordable electricity supply was frequently mentioned as a major objective in the power sectors [isa2, nsa3, nsa4, nsa5, nsa6, nsa9, nsa10, npa2, npa6, npa8, npa9]. As a domestically abundant and cheap resource, the Indian government perceives coal as the most favorable option to ensure a reliable electricity supply. The government has thus created a policy environment in the power sector favoring coal that largely remains today and, after the power sector liberalization, has attracted profit-driven private investors. Incentives for REs remained ineffective until 2016, largely due to the bad and unresolved financial situation of the DISCOMs. While private coal investments plummeted in the late 2010s, public coal investments remained to ensure uninterrupted availability of electricity in the future.

Sufficient supply

To satisfy the rapidly growing electricity demand and to ensure energy security, the Indian government has been incentivizing the use of coal [nsa5, nsa11] since independence. This particularly concerns large-scale coal-fired power projects [nsa2] financed by publicly owned institutions (Worrall et al., 2018). The Central government also implemented policies to incentivize private investments in the sector; most importantly, they encouraged long-term PPAs with a guaranteed payment of fixed costs (see the "India's power sector" section), minimizing their investment risk [isa2, nsa9, npa10, npa2].

Private profits

Since the liberalization, coal-fired power capacity has been the technology of choice for private investors, because the policy environment ensures high profits and low interest rates [isa2]. Furthermore, many private conglomerates that entered the electricity generation market after liberalization were able to complement previous business activities along the coal supply chain. For example, Adani, India's largest port developer, became the largest private power producer in the country (M&A Critique, 2014) and also acquired mines in Indonesia and Australia to import coal to India. Some of these private conglomerates also invested in domestic mining. Between 2005 and 2009, more than 100 blocks (more than 20,000 MT of coal) were allotted to private actors at zero cost except for royalties [npa2, pea2, nsa10].

These investment incentives created carbon-intensive lock-ins and powerful incumbents. PPAs, ensuring the payment of fixed costs to thermal power plants, restricted the uptake of REs, despite their dramatic cost reduction [isa2, nsa9, npa2]. Furthermore, the incumbents oppose policies that would remove subsidies or impose additional costs for coal-fired power generation [nsa3]. For example, with the large fiscal reform of 2015, the tax burden for coal and coal-fired power was reduced, while the burden on solar and wind increased [nsa3]. Some independent power producers lobbied to renegotiate even more favorable terms for their PPAs (The Wire, 2018). Lobbying is often successful due to the strong leverage of private conglomerates over the current government lead by the Bharatiya Janata Party (BJP) [isa1, nsa3, nsa5, nsa6]. Adani and Tata even have direct personal relationships with the prime minister and allegedly contributed to financing his campaign [isa2, nsa4, nsa5].

However, the rapidly falling costs of REs have lead private energy incumbents to increase their investment in RE [nsa3]. The bad financial situation of many existing coal-fired power plants and difficulties in obtaining loans for new coal projects [nsa7] have both contributed to a significant decrease in private coal investment. The large conglomerates in the power sector are now competing for higher market shares in RE markets (Chawla et al., 2018). Despite this, the policy environment is still skewed in favor of coal and 11 GW of private coal capacity is in the pipeline and will possibly come online if electricity demand rises [prea1].

Low electricity prices

DISCOMs incur large losses because of the political will to maintain low electricity tariffs for consumers (Dubash et al., 2018). Local politicians, in exchange for political support, often promise to reduce electricity prices and to provide reliable grid connections (Dubash et al., 2018). They fulfill those promises by setting electricity tariffs at subsidized rates and by allowing theft and unmetered billing (Mahadevan, 2018; Min & Golden, 2014). These electricity tariffs set by politicians impose heavy financial losses on DISCOMs. Consequently, most DISCOMs do not recover their costs and have to be regularly bailed out by the Central government.

Our interviews confirm the finding from other studies (e.g., Tongia, 2007) that policy incentives for REs remain less effective because of the dire financial situation of DISCOMs [nsa11, nsa5, nsa3]. In 2006, the National Tariff Policy introduced a feed-in tariff, which guaranteed a return on investment of 15% on RE projects and required DISCOMs to partly procure power from RE sources (i.e., RPOs). However, DISCOMs have been reluctant to increase their share of REs as they fear their financial problems will worsen because of the higher REs tariffs and because of the required grid investments for the RE integration [nsa3].

Since 2016, the financial problems of DISCOMs have been addressed more successfully by the government. The UDAY scheme improved their financial situation,[4] and the government has become more strict on the enforcement of RPOs [nsa3].

Long-term security of supply

The Ministry of Power considers coal-fired power capacity necessary to ensure the security of supply and is skeptical about the potential of REs to satisfy the fast-growing energy demand [npa4, npa6, npa8, nsa9]. Coal-fired power capacity is regarded as a reliable technology for baseload capacity [npa4, npa6], and as the only technology able to meet the peak demand in the evening (10–11 pm) (CEA, 2019) [isa1]. Given the large number of stressed assets in the power sector (see the section "India's power sector", private actors are reluctant to embark on new coal projects until PLFs begin to rise again [prea1]. While the relative share of public investment in coal-fired power plants has declined since liberalization, the coal pipeline in 2020 is 83% publicly owned (own calculation based on Shearer et al. (2020)).

For the Central government, NTPCL has been instrumental in ensuring energy security since liberalization. The government protected the dominant position of NTPCL during liberalization, despite the acceleration of private investment [npa2].[5] For example, NTPCL was absolved by the Tariff Policy of 2006 from competitive bidding until 2011 [npa2]. In this period, NTPCL signed PPAs for more than 50 GW (Sreenivas, 2018). Public support for coal to ensure energy security via publicly owned power plants emerges as the main driver of Indian coal investments in the future.

Promote domestic energy industries and personal interests

The energy sector has often been used to promote economic growth and job creation [npa2, npa23 nsa5], two primary objectives of the national government [isa2, nsa3, nsa5, nsa11, npa8]. Indian PSUs satisfy those primary objectives and several more; CIL and Indian railways are large employers and contribute to regional development and redistribution goals (Chandra, 2018). Similarly, BHEL and NTPCL are large coal incumbents that manufacture and operate coal-fired power plants and thereby play a strategic role in providing the country's energy security. Lastly, over time, vested interests along the whole coal supply chain have emerged.

Regional development and jobs

The relatively poor coal mining regions in the East strongly benefitted from, and still depend on, the coal industry [nsa10, npa2, pea2, nsa5]. The Central government used CIL to foster investment, create employment, and redistribute wealth in the coal mining regions (Chandra, 2018). In addition, CIL has built houses, public infrastructure, and provides health-care services, contributing to the well-being of the entire region (Chandra, 2018). When large-scale coal mining began, formerly remote villages became business centers [pea2]. Coal mining also generated employment in further sectors, such as road construction, transport, hotels, domestic servants, and vegetable sellers [pea2] (Pai & Carr-Wilson, 2018).

Policymakers build on continued coal production to improve their chances of reelection. For example, state-level parties put pressure on the Central government to invest in large coal mining projects operated by CIL in their constituency [nsa5, pea2, isa1, nsa4]. Coal interests exist at multiple governance levels: locally, providing jobs; directly, as small amounts of coal maintain livelihoods; and at the state and the central level, through the allocation of coal mining rights.

Job opportunities

Whether new jobs from the RE sector can replace coal-related jobs is an important concern of the government [npa3, nsa3, pea2]. Jobs in the RE sector do not, to date, geographically overlap with coal jobs. Coal jobs are concentrated in Eastern India, while solar and wind jobs are concentrated in the West and the South.[6] Given that Eastern regions have thus far not benefitted from new RE-related jobs, they persist in politically supporting coal [nsa10, nsa12, pea2, nsa5]. Developing adequate RE capacity to absorb coal-related jobs might even be technologically and economically unfeasible due to the low suitability of the Eastern region from wind and solar (Pai et al., 2020).

In addition, the total number of jobs in India may decrease by transitioning to REs. While thermal power plants are manufactured domestically, 80% of all solar cells are imported from China and Malaysia [nsa3] (ET Energy World, 2020). To protect and stimulate the domestic solar industry, in 2018 the Government of India introduced an import duty of 25% on foreign solar cells (Ministry of Finance, 2018). However, with its legal time span of only two years, the import duty is considered ineffective in fostering a domestic market and triggering large-scale investments (Dutt et al., 2019). In addition, it has adverse climate impacts by reducing the competitiveness of solar power relative to coal [nsa3] (Buckley & Garg, 2019).

Revenues

Indian Railways heavily relies on revenues from coal transport to ensure profitability [nsa12] and to maintain low passenger prices. It does this by overpricing freight transport, of which coal constitutes 44% (Kamboj & Tongia, 2018).

The increasing share of REs in the Western regions in the last decade, however, has put pressure on Indian Railways' business model. Coal power plants in Western regions, being far from coal mines,[7] are beginning to be less competitive than the increasingly cheaper REs.[8] This has reduced coal demand, which has further decreased the coal revenues from freight transport. In response, Indian Railways set higher freight tariffs, making the remote coal-fired power plants even less competitive. This reinforcing feedback loop has led to a doubling of freight tariffs between 2012 and 2017 [nsa12].

Despite Indian Railways' partial dependency on coal revenues, we find no evidence that the company or the ministry of Railways exerts any pressure to delay an energy transition away from coal. In fact, Indian Railways seems to be actively seeking strategies to reduce its dependence on coal [nsa1, npa4].

Coal is also an important source of revenues for the Central government, which uses coal income to fund various regional development projects (IISD et al., n.d.). The "Clean Energy Cess", a tax on coal, was introduced in 2010 at USD 0.80 per ton of coal and raised to USD 3.20 per ton in 2015 (Garg et al., 2017). Unlike carbon taxes that are designed to reduce the use of a pollutant, the "Clean Energy Cess" was primarily established to raise revenues, assuming a low elasticity of coal demand [nsa4].

Energy independence and personal interests

BHEL strategically contributes to India's energy independence and is also a large employer. Coal-related business activities contributed to more than 80% of BHEL's annual revenues in 2017–18 (BHEL, 2018). Decreased orders for coal-fired power plants would thus threaten BHEL's main source of revenues [isa2]. From a strategic perspective, there are concerns that shutting down the domestic turbine production could increase India's dependence on other countries and international companies, as turbines for potential coal-fired power plants in the future would then need to be imported. One interviewee thus speculated that pressure from BHEL, in combination with concerns over energy security, might explain why the National Electricity Plan suggests a stable flow of 3–5 GW of new annual coal capacity [isa2]. In addition, BHEL provided legal and technical support to facilitate the approval of the environmental clearances for several proposed coal-fired power plants that ordered BHEL turbines.[9]

Lastly, the presence of large public monopolies along the coal supply chain has created multiple opportunities to extract rents. Local and national politicians have participated in businesses benefitting from coal, for example machinery suppliers, transport, or ash treatment [npa2, prea1].

Mitigate air pollution and climate change

Most of the interviewees mentioned that the mitigation of climate change and local air pollution are also important objectives [isa2, nsa3, nsa4, nsa5, nsa6, nsa9, npa8, npa10], especially since the COP21 in 2015. However, some explicitly emphasized that they are less relevant than the objectives previously described (see the "Provide sufficient and affordable electricity supply" and the "Promote domestic energy industries and personal interests" sections) [nsa3, nsa11, npa3].

Key objectives of the government are to foster its domestic and international reputation, which led to the approval of ambitious RE targets and antipollution regulations (see the "India's power sector" section). However, the enforcement of environmental regulations remains limited, as actors profiting from coal have substantial influence over policymakers (see also the "Provide sufficient and affordable electricity supply" section).

International and domestic reputation

Higher RE targets and more ambitious pollution standards are two critical policies that have been promoted by Modi's government. The RE targets are in line with India's NDCs, which envisage a 40% share of REs in the installed capacity by 2030 and thus a substantial increase from the 24% in 2020 (CEA, 2020).[10] Enforcing the pollution standards would potentially further reduces the price gap between renewables and coal[11] and may lead to the retirement of 6 GW of old power plants, which lack the physical space to be retrofitted (npa9).

Environmental policies helped to promote Modi's international reputation and to establish better international relations [nsa3, nsa5, nsa11, npa2, npa8, nsa6, nsa12]. The COP21 was Modi's first international event as prime minister and thus an occasion to establish diplomatic relationships [nsa3]. By promising efforts toward climate change mitigation, the Indian government could ensure international support in other strategic topics, such as geopolitical conflicts [nsa3].

Domestically, announcing ambitious targets for the expansion of RE energies helped Modi establish his image as a leader, innovator, and first mover, which later became instrumental in securing support for his reelection campaign (Shidore & Busby, 2019). Setting ambitious RE targets was a low-cost political strategy [nsa3, nsa5], given that the electricity grid was capable of integrating the thus far low shares of fluctuating wind and solar electricity [npa10]. With the setting of the RE targets, private investments significantly increased. In addition, Modi wanted to distance himself from coal, which, at the time of his first election, was linked to several corruption scandals [isa1, nsa11].

The reformed pollution regulations also addressed the requirement for reduced local pollution of the urban middle class [nsa12, nsa6]. The rapidly increasing urbanization since 2010 exacerbated transport pollution in large cities, which regularly led to "front page" newspaper articles and record-high pollution levels [nsa12]. Urbanization and rising average incomes have created a vocal and politically organized urban middle class, which has become increasingly visible through additional registered environmental NGOs that influence the policy process. The main channels of influence of the NGOs are the NGT and the Supreme Court. For example, Greenpeace criticized the lack of compliance with pollution standards by private power generation companies at the Supreme Court and the NGT (Sethi, 2019; The Economic Times, 2017).

Reduce regulations

Although the Indian government approved more stringent pollution regulations, they have only been weakly enforced due to successful lobbying of incumbents. For example, when the deadline for retrofitting set by the MoEFCC expired in December 2017, almost no coal-fired power plant had actually been retrofitted (Garg et al., 2019). Instead of fining noncompliant companies, the MoEFCC simply postponed the deadline to 2022 (Central Pollution Control Board, 2018). It was reported that the Association of Power Producers, an industry association for private power producers, having well-established contacts with the Ministry of Power and within the PMO [isa1], successfully argued for the technical infeasibility of the deadline in 2017 and obtained a postponement. This case is a concrete example of a common process in India's policymaking: societal actors are formally eligible to provide comments and inputs to policies before their approval. Yet, whether these comments actually influence the policy design depends in particular on the personal or institutional contacts with the decision makers [isa1, npa5, npa8, npa9, pea3]. In addition, private companies often directly hire former government officials to exploit their network.[12]

Discussion and conclusion

Since India's independence, satisfying the demand for sufficient and affordable electricity has been a key objective for the government. Energy policies favoring coal were established, while publicly owned companies primarily commissioned large-scale coal-fired power plants. With the power sector liberalization in the early 2000s, private actors also heavily invested in coal projects, not least because incentives for renewables were ineffective. In 2020, planned coal-fired power plants are again almost exclusively publicly funded and satisfy the objectives of ensuring long-term security of supply and energy independence. Besides, there are additional drivers for the ongoing coal deployment; in addition to power generation, we find that publicly owned companies in India, especially CIL, create regional employment and economic opportunities, which lead to stark regional dependencies on coal. In addition, local and national politicians personally benefit from established and additional coal infrastructure. Despite this, the increasingly important environmental problems and pressure from the international community have recently resulted in more ambitious environmental policies, such as substantial renewable targets and more stringent pollution standards. While the renewable targets have successfully attracted RE investments, the enforcement of the pollution regulation has been delayed by private actors in the power sector.

Disincentivizing ongoing private and public coal faces various obstacles. Despite the overcapacity and the financial distress of operating coal-fired power plants, the coal pipeline still includes 54 GW from public, and 11 GW from private companies (as of July 2020 from Shearer et al. (2020)). Reducing the regulatory incentives favoring coal investments, and in particular, removing implicit and explicit coal subsidies, could effectively discourage additional private coal investments and potentially redirect financial flows toward renewables. However, redirecting public investment seems even more challenging, given that within the Central government coal is considered the main source of power generation to ensure long-term reliable electricity supply.

Furthermore, we identify a number of additional barriers to declining public coal investment. First, there is a prevailing belief in parts of the Indian administration that coal is a superior technology compared to renewables, and that there are perceived techno-economic constraints of RE-based electricity systems, such as high storage costs and lacking grid stability. To address fundamental technological doubts about the ability of REs to cover baseload electricity, it could be pivotal if industrialized countries showcase functioning electricity systems based on REs. Second, there is a regional reliance on coal for development, jobs, and fiscal revenues. An inclusive regional transition that creates new economic, cultural, and educational opportunities for Eastern India may prevent regional coalitions of actors from slowing down or hindering a phase-out. Finally, vested interests of public actors have to be addressed. International financial institutions may provide further entry points for an Indian energy transition by, for example, increasing the share of loans which are conditional on sustainability criteria. However, monitoring and enforcing environmental regulations against the interests of powerful vested interests would remain an important challenge.

The COVID-19 crisis hit coal-fired power generation particularly hard. The fall in demand following the strict lockdown measures was almost entirely born by the coal power plants, with a decreased output of 29% in 2020 compared to 2019 (Parray, 2020). This exacerbated their already precarious financial situation and further reduced the demand for new coal-fired power plants. However, the crisis might also delay needed investments in the RE sector (Bridge to India, 2020). It remains to be seen which of the two effects will prevail and despite these short-term developments, India's key objectives remain unchanged. It thus seems unlikely that the identified drivers for coal will disappear.

Appendix

This chapter contains supplementary online material at www.mcc-berlin.net/pecoal/ch08.

Notes

1 This chapter draws on the article Montrone et al. (2021). We gratefully acknowledge permission to reproduce parts of the content from Elsevier.
2 With RE, we imply wind and solar power, unless specified differently.
3 We focused our analysis at the level of the Central government. For a detailed analysis at the State and district level analysis see, for example, Bhushan et al. (2020).

4 The Central government changed course to increase its power over the state governments [nsa2, npa6]. It essentially reduced the ability of the state governments to use electricity subsidies before elections (see the section "India's power sector"). Additionally, the Central government proposes switching to a system of centrally managed direct transfers, rather than the electricity subsidies managed by the states.
5 More details on the strategic role of other PSUs are presented in the "Promote domestic energy industries and personal interests" section.
6 The 80% of Indian coal reserves are concentrated in Jharkhand, Odisha, Chhattisgarh, and West Bengal. For more detail, see Figure A8.1 in the online Appendix.
7 Coal freight tariffs are calculated on a ton per km base. For power plants located far from a mine, coal transport costs can account for 50% of the total fuel cost [nsa5, nsa9] (Kamboj & Tongia, 2018).
8 These renewable plants (mostly solar PV) on the West coast (i.e. Gujarat) are particularly cheap because of the optimal location and policy incentives (mainly enforced RPOs and subsidized transmission charge) [nsa3, npa10].
9 For example, a 1080 MW project in Telangana was initially halted by the National Green Tribunal, but subsequently greenlighted by the Ministry of Environment after the intervention of BHEL (Mahajan, 2018; SourceWatch, 2019).
10 The renewable shares include: Small Hydro Project, Biomass Gasifier, Biomass Power, Urban & Industrial Waste Power, Solar and Wind Energy.
11 Retrofitting increases costs for coal power generation between 0.34 and 0.87 INR per kWh (Garg et al., 2019). With costs between 2.5 and 3 INR per kWh for recently deployed REs, pollution standards are a sizeable instrument to reduce the price gap between coal and REs.
12 For example, the current director general of APP was a former government official involved in the power sector development.

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9 Exploring the political economy of coal

Insights from Turkey

Ceren Ayas and John Wiseman

Introduction

This chapter explores the political economy of coal plants and mining in Turkey and the impact of key political and social actors on coal investment decisions and trends. We begin by noting and exploring differences between the governments' direct and underlying objectives for maintaining and expanding coal investment. We then proceed to employ the actor-centered political economy framework, developed by Jakob et al (2020) and covered in Chapter 1, to examine the role and influence of key political and societal actors. We conclude with a discussion of the factors and dynamics with the potential to change support for coal mining and coal-fired power generation in Turkey.

There are two major reasons for focusing on Turkey as a significant site for understanding the current political economy of coal-based power generation. First, Turkey's planned capital investment in the coal power sector is the 6th largest in the world with about 20 GW of capacity to be built in the coming years (Global Energy Monitor, 2021). Turkey's plans to continue to add new coal-fired power capacity significantly differ from the goals and actions required at the global scale to achieve the emissions reduction and global warming targets mandated by the Paris Agreement. Second, Turkey provides an important case study example of the characteristics and dynamics of an industrializing country reluctant to phase out coal.

The power system of Turkey is characterized by an ongoing rapid increase in coal generation. The installed capacity of coal plants has increased substantially since 2012, the year officially declared by the government of Turkey as the 'Year of Coal'. The government of Turkey continues to maintain a strong political commitment to expanding coal plant investments (primarily lignite) in order to maintain and strengthen national security. Despite the commitment to expand coal plant investments, the realization rate of the plants remains limited. Many of these planned coal investments (65 GW) have been canceled or shelved in the last decade (Global Energy Monitor, 2021). While the realization of new coal projects has been very limited, the phase-out of existing coal-fired power plants still remains extremely slow. This chapter, therefore, looks at the enabling and constraining factors behind coal mining and power generation in

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Turkey and explores the role of different public, private and civic actors in the decisions regarding the underlying objectives of the ongoing dependence of Turkey on coal.

The key drivers maintaining investment in coal-based energy and constraining an acceleration of the transition to nonfossil energy technologies in Turkey are primarily political. Evidence from interviews with diverse experience and knowledge of the coal industry in Turkey highlights a conflation between direct objectives, frequently stated by the current government as strengthening national security and the underlying objective of maintaining the legitimacy of the current regime. From this perspective, the ongoing dependence of Turkey on coal in Turkey is primarily driven by the current government goal of strengthening national security (by exploiting the country's lignite resources) and maintaining centralized political power. This latter objective also leads to a strong focus on direct financial incentives to both local and international companies designed to increase lignite-based coal generation. These pressures currently override factors with greater potential to steer the government toward decarbonization. These factors include the low calorific value of lignite; the limited business interest in investing in coal and tensions arising from the environmental, political and financial concerns of citizens and business incumbents.

The chapter is structured as follows. The 'Methodology' section discusses the methodology employed to collect and analyze the data presented in this chapter. The 'Context: the coal sector in Turkey' section presents a brief overview of the coal industry in Turkey. In the 'Results: political economy of coal in Turkey' section, we present the results from interviews and document analysis on the political economy of coal in Turkey. In doing so, we highlight the conflation of the government's stated objectives of supporting the coal industry and the underlying government objectives of maintaining the legitimacy of the current regime. The 'Discussion and conclusion' section provides a discussion of factors and dynamics with the potential to change support for coal mining and coal-fired power generation in Turkey.

Methodology

The research methodology employed in this research is informed by a qualitative single case study approach (Stake, 1995). We used qualitative semi-structured expert interviews as a method to achieve our research objective of exploring the underlying factors leading to strong government support for coal production despite growing evidence that power generation from coal and mining is economically uncompetitive. For the purpose of empirical data collection in Turkey, we operationalized the actor-centered political economy approach of Jakob et al (2020). We conducted semi-structured interviews with 22 key stakeholders via videoconferencing tools between the period of April and June 2020. The interview questions are presented in the online appendix.

We categorize interview partners by actors groups, including societal actors operating on an international level ('si'), societal actors operating on a national level ('sn'), business and industry nongovernmental organizations that are representing both high- and low-carbon industries ('b') as well as political actors ('p'), also including experts within commissions in opposition parties. Note that our sample of interviewees does not include government authorities. While this is an obvious limitation of the research, we attempted to mitigate the lack of government officials in the interview process by incorporating official documents and strategies in the data analysis phase. The institutional clustering of the key informants that took part in the data collection process is as follows. The vast majority of the participants are working in civil society organizations (10), followed by think tanks (2), foundations (2), Business and Industry Non-Governmental Organizations (2), health platforms (2), academia (1), political party (1), lawyer network (1) and public professional organization (1). 11 of the key participants are societal actors operating on a national level, 7 of them are societal actors operating on an international level, 3 of them are business actors and 1 of them is a political actor.

We utilized primary data based on the key themes that emerged throughout the interviews as well as secondary data derived from official documents and gray literature. Regarding the contextual factors and key players, 328 vivos (data that puts emphasis on the actual spoken words of the key informants) and 62 umbrella themes emerged throughout the interviews. We have categorized these themes under 7 categories and reflected the emerging challenges and insights outlined in the 'Results: political economy of coal in Turkey' section.

Context: the coal sector in Turkey

This section gives a short overview of the coal sector and current trends. We then focus on the role of public and private institutions in governing and influencing decisions regarding the expansion of coal investments with a specific focus on the role of *de facto*, 'unofficial' key players in the public sector. For detailed information on the roles and the mandate of primary public authorities responsible for energy decisions and the primary private actors of coal investments that have been at the forefront in coal generation, see the online appendix.

Coal industry state of play and trends in Turkey

Coal has a significant share in the electricity generation mix of Turkey. 37.2% of electricity generation is provided from coal (16.7% from local lignite and hard coal), 30.3% from natural gas, 19.7% from hydropower, 6.5% from wind, 2.6% from solar energy, 2.4% from geothermal and 1.3% from other resources (Ministry of Energy and Natural Resources, 2019, Turkish Electricity Transmission Company, 2020). Coal imports have grown steadily over the last

40 years and are used mostly for power generation (Eurocoal, n.d). They have increased from 19.5 Mtoe in 2012 to 24.3 Mtoe in 2019 (IEA, 2021). Half of the coal imports to Turkey are from Colombia, one-third is from Russia, 7% is from the United States, 5.3% is from Australia and 4.2% is from South Africa (Eurocoal, n.d).

Turkey's energy system increasingly depends on coal. 29 new coal-fired power projects with a capacity of 33 GW are currently being planned (announced or permitted); in addition, two plants (1.4 GW) are under construction (Global Energy Monitor, 2021). In addition to new coal, there are ongoing efforts to rehabilitate and privatize existing coal plants in order to prolong their lifetime.

As there is no plan to phase out coal in Turkey, existing coal-fired power plants are retired only very slowly once they reach the end of their lifetime. Commissioning of new coal-fired power plants, however, remains limited despite strong government support. New coal projects with a total capacity of more than 76 GW have been canceled between 2010 and 2020 (Global Energy Monitor, 2021). The interest of the private sector regarding coal mining also remains low despite the state's strong facilitative role. Out of more than 5 Gt of total reserves that are proposed to be mined, only one tender call (Eskişehir Alpu basin) has been finally realized, which resulted in the postponement of the project due to the unavailability of offers (Greenpeace, 2020).

Governance of the power sector and key players

Turkey is in the process of privatizing its electricity market. In terms of ownership of generation assets, 64.8% of Turkey's total installed capacity is owned by private entities and 22.2% is owned by the state-owned enterprise, EÜAŞ (Electricity Market Regulatory Authority, 2019). The primary private actors driving coal investments at the forefront in new coal generation in Turkey are EnerjiSA, Cengiz Enerji, Limak, Eren Enerji, Aksa, Bereket, Konya Şeker, Ciner, Çelikler, Diler and İC İÇTAŞ (Kurçaloğlu, 2019). It is important to note that these same companies have been active in the recent rehabilitation, retrofitting and capacity increases of existing coal plants and mines. In terms of ownership of mines, two state-owned coal mining companies, the Turkish Coal Operations Authority and Turkish Hard Coal Enterprises, own 60% of the lignite mines, whereas 203 million mt of reserves is owned by private players (GBR, 2018). Among the owners of lignite mines, İmbat Madencilik, Fernas Holding, Demir Export, Yapi Tek, Erdemir Madencilik, Bereket Holding and EMSA Enerji stand out in terms of the size of the assets. Detailed information on the biggest private operators of power plants in Turkey is provided in the online appendix.

Stakeholders interviewed for this study frequently mentioned the Presidency of Strategy and Budget and the Turkey Wealth Fund (TWF) as the most influential players driving coal policy and investment decisions in Turkey [sn4, si4, si7, sn8; 11 mentions]. The influence of these agencies extends beyond their formal energy-specific mandate to encompass high-level strategic guidance to facilitate investment decisions. These institutions play a key facilitative role in utilizing new coal reserves *on behalf of* the private sector. The governance scheme for the new domestic lignite mines, for example, involves transferring coal reserves to the private sector with obligations consistent with a build-operate model (Ministry of Energy and Natural Resources, 2019). The Presidency of Strategy and Budget is responsible for contributing to the processes of policy and strategy development, investment programming and regulation of energy and mining markets. The Turkey Wealth Fund Energy (TWF Energy) formed in April 2020 is the responsible authority for strategic energy investments in Turkey and has an official mandate to utilize local resources in electricity generation. TWF currently owns the two largest power generation and distribution companies. This corresponds to the ownership of 27% of power assets in Turkey.

Since the fund owns power assets, it is not clear how TWF Energy functions as both a fund and a utility and how it differentiates from the existing state-owned enterprise, Electricity Generation Company (EÜAŞ). Moreover, the role of the state fund/utility in ensuring the operation of liberalized markets with transparent financial flows remains ambiguous. As one interviewee noted, these blurred roles have important governance and accountability implications.

> Public economic enterprises are subject to Court of Accounts audits, or parliamentary scrutiny. I mean they are subject to public scrutiny unlike the Wealth Fund. I mean you can take action; you have executive power, but no one can audit you. So, it turns into a weird beast that is exempt from scrutiny.
>
> [si4]

It is also important to note the significant involvement of President Erdogan and his son-in-law (the former Minister of Energy and Minister of Treasury and Finance) in these organizations. This can be read as yet another reflection of the concentration of decision-making in the Presidency during the last decade.

The key private sector players in the energy industry in Turkey play a significantly different role from private sector energy companies in countries that depend on coal exports such as Australia or rely on local coal resources such as Germany and Poland. Given that there is no major private sector involvement in mining (lignite or hard coal), the private sector does not actively lobby to keep those assets.

Results: political economy of coal in Turkey

This section addresses the objectives leading to the maintenance of strong government support for coal production. Despite growing evidence that power generation from coal and mining is increasingly economically uncompetitive, reliance on coal helps to achieve outcomes that further some underlying political objectives that are only indirectly linked to energy policy. The most important underlying objectives in this regard are safeguarding national security and maintaining political control and legitimacy of current regime. Energy

Table 9.1 Underlying and direct objectives of new coal generation in Turkey

Underlying objective	*Direct energy policy objective*	*Aspects*	*Number of mentions in the interviews*
Maintain and strengthen national security	Energy security	Decrease reliance on imports Reduce foreign debt Decrease political dependency on non-NATO allies	15
Maintain political control and legitimacy of the current regime	Private profit	Ensure favorable operating environment for business incumbents	57
	Employment	Ensure jobs and working environment for blue-collar workers	36
	Environment and health	Minimize public resistance concerning vulnerabilities from coal (pollution, expropriation and land degradation of habitats)	178

policy is used as a way to further these objectives by means of safeguarding energy security, securing private profit for the coal and construction industries, creating employment as well as (mostly local) environmental considerations. Table 9.1 provides a summary of the underlying objectives of new coal generation derived from official documents (i.e., statements in government plans and strategies as well as policy and regulatory frameworks) as well as evidence from interviews.

The number of mentions by societal, business and political actors provides insights on which actors prioritize the respective objectives. The objectives of national security and political legitimacy are of prime importance to government and public authorities. This includes decreasing reliance on imports, reducing foreign debt, decreasing political dependency and ensuring jobs. Private sector actors are primarily interested in maintaining profitably and a favorable operating environment. Civil society is more strongly focused on addressing the vulnerabilities that arise from coal. The dynamics and interrelationships of these objectives are discussed in more detail below.

Energy security

In the context of Turkey, energy security is formally tied to national security. Energy security cannot be understood in isolation from political and economic security. Turkey has tied its political trajectory to a vision of coal-based technological development. Increasing the dependence on coal has political and economic security aspects along with energy security. Turkey's approach to coal mining and coal-fired generation is rooted in a strategy to reduce dependence on imported natural gas and imported coal (IEA, 2021). Coal is portrayed as contributing to national (not only energy) security for the reasons of decreasing reliance on imports, reduce political dependence on other countries (specifically Russia) and reduce foreign debt. Coal investment priorities outlined in key government policy documents include maintaining national security, including through decreasing reliance on imports, reducing foreign debt and decreasing political dependency on non-NATO allies (Electricity Market Regulatory Authority, 2019, Presidency of the Republic of Turkey Investment Office, 2018). As noted above, coal imports to Turkey continue to rise despite encouragement of domestic lignite production. While this trend has been partially driven by a desire to reduce dependence on gas imports, it also reflects the fact that energy from domestic lignite production has been insufficient to meet rising energy demand.

According to the 2019–2023 Strategic Plan (Ministry of Energy and Natural Resources, 2019), the official overarching goals of the energy sector are: to ensure the security of supply, increase energy efficiency, strengthen institutional and sectoral capacity, increase regional and global activity in the energy sector and natural resources, technology development and localization, increase the predictability of the market; and increase the production capacity of the mining sector in a sustainable way.

Regarding the theme of energy security, the topics of reducing debt through decreasing energy import dependency and bolstering national security through decreasing political dependence emerged throughout the interviews [si3, si4, sn2, sn3, sn4, sn6, sn11; 15 mentions]. Among these subthemes, the preference on strengthening local coal production to decrease reliance on imports and balance the current account deficit and decreasing political dependence on non-NATO allies stands out.

As a result, the current government has been framing the decision to expand investment in coal as part of a strategy of 'localization in energy policy'. Renewables are discussed in a similar manner in addition to coal investments (within the official 'localization' policy of *Local and National*) whilst noting their intermittency and flexibility 'issues'. In other words, the role of renewables is subsidiary rather than substitutive (Foundation for Political, Economic and Social Research, 2019). This vision is operationalized through significant financial incentives and support for local coal-based industries. The state provides an enabling environment for new coal investments by maintaining policy and regulatory frameworks that encourage new coal investment and strengthening investor certainty through purchase guarantees for lignite. This is secured through subsidies and feed-in tariffs. Lucrative incentive packages are provided by the government to support the financing of new coal investments. These incentives are designed to stimulate build-operate or build-operate-transfer projects as public-private partnerships.

Turkey has also implemented a wide range of policies designed to support the development of lignite projects by subsidizing power plant capital expenditures as well as operating costs for lignite mines (Algedik, 2015, 2017). In 2015, a sum of TRY 9 million (USD 1.1 million) was directed to fossil fuels, including coal, natural gas, oil and its derivatives in the form of tax incentives (Ateş and Acar, 2020). A feed-in tariff for lignite has been introduced in 2017 to secure the financial viability of mining operations. The government introduced 35 years of operating rights, 15-year power purchase guarantees and exemptions from future-proof carbon taxes and fees to provide a favorable investment environment. Exempting coal investments from additional burdens such as a carbon tax also serves this aim. Tax reductions, social security premium support, interest support and VAT exemptions are in place. Coal investments receive indirect financial support through the exclusion of these new investments from environmental legislation (Gümüşel and Gündüzyeli, 2019). Additional information regarding the policies that support coal over other energy sources is provided in the online annex.

Private profit

The objective of 'private profit' incorporates the need to accommodate the interest of the private sector in order to maintain the legitimacy of the current regime. Our analysis demonstrates that the key private companies in Turkey leading the development of the next generation of energy investment do not have a historical vested interest in coal-based technologies and tend to have a diverse portfolio of low and high carbon technologies. The major private players benefiting from new coal generation – Cengiz İnşaat, Kolin, Limak and Kalyon – stem from the construction sector (Oxford Business Group, 2015). For this reason, the level of government support needed to encourage coal investment by these firms in Turkey is high. Key energy companies are active in many large-scale construction projects facilitated by the government, including bridges, highways and telecommunications (see Graph Commons, 2015 for a full list of interactions of the private sector and the government in large-scale infrastructure projects in Turkey; see Europe Beyond Coal, 2020 for coal plant privatizations).

The close entanglement between the government and the private sector is demonstrated by the fact that construction companies curry political favors that involved losses in coal-related activities in exchange for lucrative deals in other sectors [sn1, si4, si7, b2; 5 mentions]. This is reflected in one of the interviews as

> From time to time, they feel, or have felt, obliged to go into unprofitable ventures. The best example for this […] is that Konya Şeker, Pankobirlik, bought the Sivas Kangal thermal plant. Because this has nothing to do with their usual business and they are constantly losing money. Apparently, they had to do this because of political concerns, I mean political coercion. Erdoğan apparently said to Konak,' 'You need to buy this. And you need to bid at this price.' So, they bid for it at that price, etc. Anyway, that's why most of these people are there. They adopt this approach; 'Whatever happens here, stays here'.
>
> [si4]

Ensuring a favorable operating environment for business incumbents emerged as an important subtheme of maintaining political control and legitimacy of the current regime [si1, si3, sn1, si4, sn2, p1, sn3, si5, sn4, si6, sn5, sn6, si7, b1, b2, sn8, b3, sn11; 57 mentions]. See Paker (2017) for a detailed analysis on 'politics of serving' that elaborates on the megaprojects of the AKP as a tool of hegemony building. This mandate emerged with AKP in opposition to the politics of identity or wardenship in the neoliberal reorganization of the state. This mandate is based on offering large-scale infrastructure projects as services regardless of their social and ecological costs. Adaman, Arsel and Akbulut (2017) argue that the construction and energy sectors reproduced the existence of the state by their relatively low-level requirement of human capital and technical know-how whilst having a quick turnaround on capital outlays. The conceptualization of 'infrastructural moment' coined by Bridge, Özkaynak and Turhan (2018) to characterize the ramping up of energy infrastructure as a means of advancing the material interests of specific actors that are in control of the construction sector. This is reflected in one of the interviews as

> What we call the state or the ministry is, in fact, a public reactor; what we call people are the public itself. These two [actors] clash on the basis of an unbalanced power dynamic; a public actor acts on behalf of a private sector actor, and extends and strengthens the latter's rights at the expense of the public, assuming the task of managing all these rights on behalf of the private sector.
>
> [sn6]

The relationship between business incumbents and the decision-making authorities is mostly assessed as a criticism related to authoritarian decision-making practices. The relationship between incumbent companies and the President, the vested interests of the companies, issues regarding corporatist decision-making, and the protection of private interests by public authorities and issues regarding the late privatization of the assets are reported within this subtheme. Involvement of the private sector in renewable technologies alongside their coal investments (enabling a shift from coal to renewables) is mentioned as a potential enabling environment for transition specifically by the participants representing the business community. To give an example, the state has granted the construction of three utility-scale projects (coal, solar and wind) to one company that is active in construction sector (Kalyon Holding) in 2017 and ensured a purchase guarantee for each of these projects. This is reflected in one of the interviews as

> We did privatize coal-fired thermal plants, but we did it with certain oligarchic capital-owners, such as Kolin, Limak, Çelikler, Bereket Energy, etc. that have close relations with the government. This was also the case for renewable energy. Certain subsidies were provided for renewable energy,

> such as YEKDEM, and YEKA. But these have always been intended for a small circle [of investors].
>
> [si5]

Employment

The underlying objective of 'employment' incorporates the employment structure of the coal sector along with the jobs that are negatively impacted by new coal investments. Coal-based industries are playing a declining role in maintaining employment in Turkey. The employment structure of the coal sector in Turkey is significantly different from other coal-dependent countries with stronger coal phase-out and just transition agendas in three ways. First, the number of workers in incumbent coal-dependent industries in Turkey has already been in steady decline without a phase-out policy. Second, the added value of the coal sector is not decisive in the overall employment structure and continues to lose its importance. Third, the working conditions of workers in the coal industry in Turkey are already poor due to a lack of unionization and extensive use of subcontractors. The unionization rate in the mining sector has steeply diminished. While the overall unionization rate was 67% in the mining sector in 2003, it fell to 19% by 2015 (International Labour Organization Office for Turkey, 2016: 52). This situation allows casual, short-term working conditions that limit the capacity of mine workers to form a strong constituency with political power. In short, the coal trajectory in fact provides poor employment prospects. This trend is further intensified by the limited employment opportunities arising from the disruption caused by coal mining to the agricultural mode of production. Detailed information on the employment structure and vulnerabilities associated with coal plants and mining is provided in the online appendix.

The goal of maintaining and creating employment opportunities for blue-collar workers emerged as an important subtheme of maintaining political control and legitimacy of the current regime [si1, si3, sn1, si4, sn2, p1, sn3, sn4, si6, sn5, sn6, sn8, b3, sn11; 36 mentions]. This theme includes reference to the employment vulnerabilities of the agricultural and mining sectors as well as the employment opportunities of renewable technologies. The vulnerabilities associated with employment in the agricultural and mining sectors and the employment opportunities of renewable technologies are frequently noted [si1, si3, sn1, si4, sn2, p1, sn3, sn4, si6, sn5, sn6, sn8, b3, sn11, 36 mentions]. The vulnerabilities regarding employment are not only understood as the occupations related to coal, but also the potential exacerbation of the mean of the existence of the local communities who rely on agricultural production. The change of working profile from agricultural worker to miner or blue-collar worker in coal plant operations due to expropriation of agricultural land emerged as a significant theme throughout the interviews.

Environment and health

The underlying objective of 'political power' incorporates material, social and political costs of new coal investments and citizen concerns based on these vulnerabilities. Coal plants pose a significant threat to public health and are an important contributor to air, water and soil pollution in Turkey. Minimizing public resistance concerning vulnerabilities from coal is premised on the need to maintain political control and legitimacy of the current regime. This theme is widely reported throughout the interviews. Pollution, expropriation and land degradation of habitats are listed among the most prominent vulnerabilities driving public resistance [si1, si3, sn1, si4, sn2, p1, sn3, si5, sn4, si6, sn5, sn6, si7, b2; 178 mentions].

Empirical evidence reveals that citizen concern is growing due to the risks and impacts of coal-based power generation and coal mining in Turkey. The public awareness of climate change in Turkey is quite high. The majority of the population is concerned about climate change, 75% according to the analysis conducted by İklim Haber and Konda (2018) and 76% according to the IklimIN project (2018) conducted by the Ministry of Environment. Only 5% of the society supports coal power plants (İklim Haber and Konda, 2018). Çarkoğlu (2017) demonstrates that environmental concerns occupy relatively little space in party politics and there is a clear reflection of a partisan divide that shapes how the masses react to these concerns. Legal litigations against coal investments are increasing (Özlüer et al., 2018) so as the local- and national-level civic resistance (Environmental Justice Atlas, n.d).

Air quality is seen as an important driver of closure of coal plants as well as contesting new coal investments [si1, si3, sn1, si4, sn2, sn4, sn6; 14 mentions]. The presidential decision to close six plants in January 2020 is regarded by many as being influenced by public concerns over the health impacts of coal mining and combustion. Empirical evidence also shows the willingness of the NGOs in continuing their campaigns and legal litigation in contesting new coal plants and mines in Turkey. Local citizen groups in Amasra, Hatay, Bursa, Eskişehir and Adana are mobilizing to oppose new coal plants (Global Energy Monitor, n.d). See Turhan, Özkaynak and Aydın (2019) on historical transformation of grassroots mobilization and political engagement through the case study of Aliağa. Throughout the interviews, the impactful work on the NGOs was noted [si1, si2, si3, sn1, p1, sn5, sn7, b1, b2, sn8, b3, sn9, 32 mentions] and along with their catalyzer role on halting coal plants [sn2, sn3, sn4, si6, sn5, 17 mentions]. In contrast, some respondents stated the need for improvement of the civic efforts [si3, sn1, si4, sn2, sn3, sn6, 19 mentions]. These factors are influential in the increased material, social and political cost of the coal-based vision and decline in the realization of the actual plans despite the strong state support.

Discussion and conclusion

Turkey has tied its political trajectory based on a vision that currently stabilizes the coal regime. The key drivers in maintaining investment in coal-based energy and constraining the acceleration of the transition to nonfossil energy technologies are in fact primarily political. Our analysis shows that this vision provides ways for political control to be maintained. Hence, the underlying objectives that the coal-based trajectory depends on are primarily based on maintaining political control and legitimacy of the current regime that include political ties up to the highest level of the government.

Contrary to these objectives, the 'coal rush' meets with a reality where the underlying objectives are in tension with the coal trajectory. A number of factors have the potential to reduce official support for power generation from coal mining and coal-fired power generation in Turkey. These factors create a potentially strong enabling environment for Turkey to accelerate an equitable and orderly phase-out of coal as well as halting new coal investments. Contrary to political will to increase the share of coal in power generation, the supporters of the ongoing dependence of Turkey on coal are increasingly confronted with a series of contradictory trends to maintain political control and legitimacy of the current regime and strengthening national security. First, expanding coal investment falls short of ensuring a favorable operating environment for business incumbents. Second, coal is not the most viable technology for maximizing jobs and creating a favorable working environment for blue-collar workers. Third, the ongoing dependence of Turkey on coal is facing intensified public resistance due to vulnerabilities from the technology. We briefly elaborate on these factors below.

Energy security

Maintaining and strengthening energy security through the vision of scaling coal investments is contradictory to market realities. A liberalized market without significant disruption by subsidies, in which the investment decisions of private sector actors depend primarily on market dynamics, has the potential to alter Turkey's coal-dependent outlook.

Private profit

Expanding coal investment falls short of ensuring a favorable operating environment for business incumbents. This means that private sector vested interests and lobbyists focused on protecting coal-based industries are less influential than they are in countries with stronger historical legacies of incumbent private sector coal investors.

Employment

Coal continues to provide employment for a declining but still politically significant number of workers in some regions. Many of these non-unionized jobs remain, however, low paid and insecure. The longer term social and economic challenges facing coal dependent workers and communities will require well planned, adequately financed strategies enabling a just and orderly transition to new sources of employment. Proactive and well-integrated regional economic transition strategies will also be an essential foundation for securing the economic and employment future of agricultural workers.

Political power

The ongoing dependence of Turkey on coal is facing intensified public resistance due to vulnerabilities from the technology. Citizen support for transitioning away from coal and opposing new coal mines and plants is likely to continue due to concerns about climate change, health impacts of air pollution, vulnerability and poor working conditions of coal workers and coal-dependent communities, concerns from the agricultural sector and impact on natural habitats.

To conclude, the debate about the future of coal plants and mines in Turkey remains controversial and contested due to ongoing tensions between the objectives of strengthening national energy and economic security on the one hand and on the other of maintaining the political legitimacy and control of the current regime. Further research is needed to strengthen understanding of factors with the potential to create a more favorable environment for low-carbon technologies consistent with goal of maintaining political legitimacy. A thorough analysis to assess the role of regional political, business and societal actors in decisions regarding the energy sector is also needed. Further research is also needed to explore how employment matters in political power and elections in Turkey. Finally, it will be important to strengthen understanding of the extent to which action to address equity and justice concerns will be important in facilitating an accelerated transition away from coal in Turkey.

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Appendix

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Part III

Countries phasing in coal

10 Competing energy visions in Kenya

The political economy of coal

Sinem H. Ayhan and Thabit Jacob

Introduction

Having outperformed with the highest rate of electricity access in East Africa (75% in 2018), the Kenyan government aims to achieve universal access by 2022 (MoEP, 2018a). To accomplish this target, coal has emerged as an attractive part of the power generation mix upon the discovery of an estimated 400 million tons of domestic coal reserves in the Mui Basin in Kitui County in 2007 (Boulle, 2019). Since then, the energy sector planning has prioritized the construction of new coal-fired power plants (LCPDP, 2018; MoEP, 2018a).

The long-term planning of the period 2017–2037 as reflected in the Least Cost Power Development Plan (LCPDP) estimates coal to comprise 13.6% (amounting to 981 MW) of the total installed capacity by 2030, increasing from zero of the current level (LCPDP, 2018). Due to the risk of oversupply, the government has reduced the proposed coal capacity in Lamu to 384 MW, one-third of the original plan, through the revision of the medium-term planning (MTP3, 2018). Coal is considered as an important low-cost fuel option for expansion planning, besides geothermal that currently accounts for the largest share of the generation mix after hydropower (LCPDP, 2018). At present, the government has no active carbon-intensive project, except for the medium-speed diesel generation plants. The composition of the generation mix, with more than two-thirds coming from renewables, makes the Kenyan grid one of the cleanest and greenest in the world [polit2]. In line with this low carbon development trajectory, President Kenyatta pledged through its nationally determined contribution (NDC) to the Paris Agreement in 2015 to abate greenhouse gas (GHG) emissions by 2030 by 30% relative to business as usual (MoENR, 2017).

Contradicting its international commitments, the Kenyan government announced in 2015 the construction of the first coal-fired power plant in Lamu County, expected to be in operation by 2024 running on imported coal from South Africa (LCPDP, 2018; MoEP, 2018c). Lamu is a UNESCO World Heritage site, which has attracted wide opposition by local and international actors. In the middle of contestations and local resistance around the environmental and social impacts of the proposed plant, a 25-year power purchase

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agreement (PPA) was signed in 2017 between the plant's owner, Amu Power Company and Kenya Power, the single buyer. Since then, the National Energy Tribunal (NET) has overseen several lawsuits for the establishment of the coal plant in Lamu, which has led to delays in its construction due to the breach of regulations when issuing the license to AMU and lack of alignment with the environmental impact assessment (Wambulwa, 2019). Recently, major financiers of the coal plant, notably the Chinese investor, have abandoned the project, allegedly, due to associated environmental and social risks (Shekuwe, 2020). As of March 2021, the construction has not yet begun with the outcome of the NET's stop order in place.

Following such developments, the future of coal in Kenya depends on several dynamics, on which this chapter intends to shed light. In particular, the chapter aims to analyze the underlying economic and political drivers of the policy-making process in the energy sector. It builds on a broad body of literature on the political economy of energy policies[1] and a few earlier studies from the SSA region (e.g., Boulle, 2019; Jacob, 2017). With a particular focus on low carbon energy transition, Newell et al. (2014) conduct stakeholder interviews to explore the role of politics, actors, and institutions in enabling or constraining the pursuit of climate compatible energy development in Kenya. Taking the case of support to solar PV in China and Kenya, Ockwell et al. (2017) develop a political economy analysis of state-led energy transformations to understand how different aspects of statehood influence the nature and prospects of the sorts of transformations. The closest research to ours is Boulle (2019), which uses political settlement theory and discourse network analysis to study the political economy of coal in Kenya. His analysis reveals the importance of political motives and vested interests behind the support for the establishment of coal plant in Lamu, despite a strong civil society opposition.

Adopting the theoretical framework by Jakob et al. (2020) covered in Chapter 1, we seek to understand the complex interplay of different objectives and interests of various actors in shaping the energy sector planning, especially the development of the coal sector in Kenya. The implementation of the framework is achieved by semi-structured in-depth interviews with key stakeholders in the energy sector. The interview data are complemented with the review of secondary literature, including scientific journals and news chapter articles as well as official policy documents. Due to Covid-19 and subsequent travel restrictions; interviews were conducted online via Zoom between September and October 2020. We conducted a total of 18 semi-structured in-depth interviews with policy makers, national and international nongovernmental organizations (NGO), civil society representatives, academics, and industry representatives. To anonymize the interviews, we categorize the actors into four groups: political, societal national, societal international, and business/private sectors.[2]

The present analysis enables us to gain additional insights and uncover the driving forces behind different competing visions in terms of the support of and opposition to the establishment of the coal sector in Kenya – that is universal electricity access and energy security, promotion of industrialization, rent-seeking and vested interests, and environmental sustainability. In the remainder of the chapter, we elaborate on these four objectives following a brief discussion on the governance of energy sector.

Energy sector governance: a mix of private sector and state participation

Kenya is one of the first countries in SSA to institute market-oriented power sector reforms, starting by the mid-1990s. The reforms mainly focused on unbundling of power utilities, private sector participation, and creation of an independent regulator. Upon the unbundling generation from transmission and distribution in 1997, Kenya Electricity Generating Company (KenGen) has become solely responsible for electricity generation. KenGen is a partly privatized company with a government share of 70% and owns more than 70% of total installed capacity (Godinho & Eberhard, 2019). Since the establishment of the state-owned utility for transmission, Kenya Electricity Transmission Company (KETRACO) in 2008, a partly privatized transmission and distribution company (with a government share of 51%), Kenya Power and Lighting Company (Kenya Power) has focused on distribution and serves as the single off-taker in the sector (Godinho & Eberhard, 2019). The key actors are illustrated in the following chart.

The generation sector is complemented by several independent power producers (IPPs) that sell electricity through long-term PPAs signed with Kenya Power (World Bank, 2017). As of 2018, there are 12 IPPs in operation – primarily diesel-fired – with aggregate capacity of 695 MW, accounting for about 30% of the electricity generation (Godinho & Eberhard, 2019). The sector still lacks an enabling policy framework for the private investors' participation. The only existing regulation is the feed-in tariff policy of 2012 that enables the private actors to negotiate with the government to sell their energy to the national grid at a predetermined tariff for a given period (Ndiritu & Engola, 2020).

Kenya has recently embarked on a series of reforms through the new Energy Policy and Energy Act of 2019 to align the policy and regulatory framework of the sector with the 2010 Constitution and its devolution framework (Energy Act, 2019; MoEP, 2018b). A key provision is the sharing of the roles of electricity planning, development, services, and regulation between the National Government and 47 county governments. The Act stipulates the county governments to have their own budgets, identify and prioritize their energy needs, and find investors to support the electricity generation within counties [socint3, socint4, socn4].

The Energy Act also envisages creation of new institutions or expanded mandates for existing entities, particularly the Energy and Petroleum Regulatory Authority (EPRA) as the successor to the Energy Regulatory Authority established in 2007 (World Bank, 2017). EPRA together with the Ministry of Energy stands in the center of the sectoral planning and is also responsible for

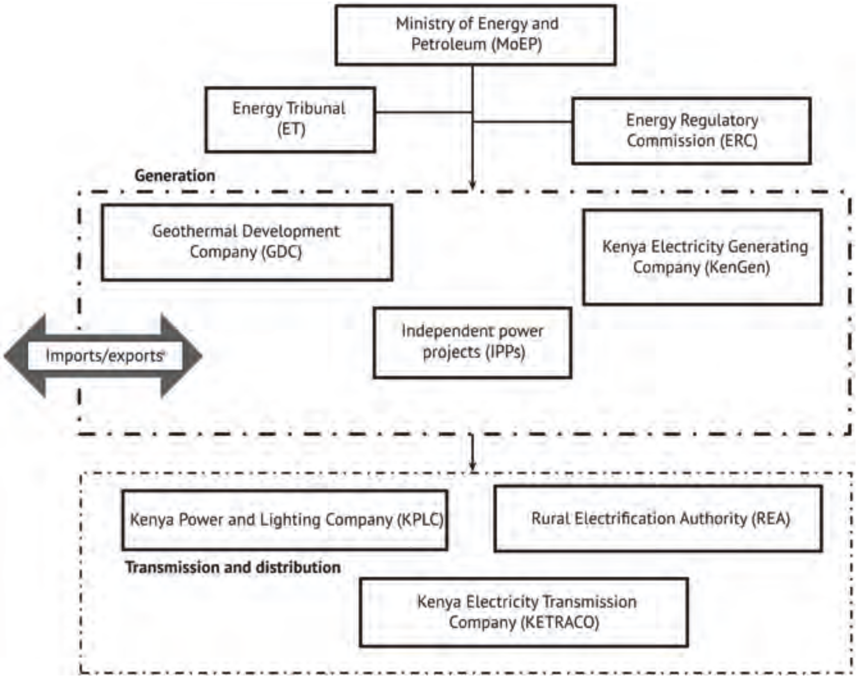

Figure 10.1 Institutional framework of the power sector.
Source: Eberhard et al. (2016: 102).

authorizing the construction of a power plant, issuing the licenses for IPPs, and determining electricity tariffs [socn1]. Despite its autonomy, EPRA's decisions are subject to an approval of the board, including members from the Ministry of Energy [socint1]. Unlike nuclear and geothermal energy, there is no specific organization for coal, which falls under the responsibility of EPRA and the Ministry of Energy (Figure 10.1).

Driving forces behind the establishment of the coal sector

Based on the interview data, we first derive major arguments for pro- and anti-coal narratives in Kenya and then cluster these arguments into four broader objective groups: universal electricity access and energy security, promoting industrialization through infrastructure projects, rent-seeking and vested interests, and environmental sustainability.

To facilitate the citation of the interviews, we abbreviate the aforementioned actor group names as *polit* (political actors), *socn* (societal national), *socint* (societal international), and *priv* (private sector).

Universal electricity access and energy security

Electrification of underserved remote areas

A remarkable achievement in scaling up connectivity was made in the last five years with the access rate increasing from 32% (accounting for 3.5. million connections) in 2014 to 75% (accounting for 7.5 million connections) in 2018[3] (IEA, 2019). This has been achieved through the government's interventions in collaboration with development partners (MoEP, 2018a). Despite this achievement, there is still a large population mainly living in remote rural areas without access to electricity given the too centralized grid system, as seen in Figure 10.2. The Last Mile Connectivity Program (LCMP) emerged as a part of the interventions to ensure everyone has access to electricity by 2022. The program focuses on rural areas and slums where connectivity is poor (AfDB, 2014). As a complement to the LCMP, the Kenya Off-Grid Solar Access Project (KOSAP) was introduced in 2017, targeting remote, low density, and traditionally underserved areas of the country (KOSAP, 2017).

Lamu where the controversial coal power plant is planned, is included among the 14 marginalized counties targeted by KOSAP. As seen in Kenya's grid map, Lamu region located at the east coast is far away from the distribution and transmission lines, which unveils coal as a fast and cheap solution. A number of interviewees argue that the initial motivation of the Lamu plant was technical rather than being a political interest [socn2, socn7]. Mombasa, the second-largest city, located at the east coast, was highly reliant on diesel-fired power plants for electricity generation. Given the lack of high-voltage transmission lines, it was impractical to evacuate power from Naivasha to Mombasa. The rationale behind the government's decision was to build a coal power plant at the coast, which is relatively cheaper and arguably less polluting than the medium-speed diesel plants, and to meet the energy needs of the region [socn2]. To address this shortfall in the coastal region was among the driving forces behind coal presence in the LCPDP. This technical constraint no longer exists, after a high-voltage line between Mombasa and Naivasha has recently been built. Nevertheless, the contractual obligations from the PPA remain as a driving force for the construction of the coal plant [socn2].

Affordable electricity

High connection charges and high costs of electricity supply to rural and peri-urban households are supplementary arguments to explain the gap in electricity access (MoEP, 2018a). As of 2019, manufacturers in Kenya paid electricity tariffs of 15.6 Kenyan shillings (KShs) (14 US cents) per kilowatt hour (kWh), which is higher than the prices in Ethiopia (4 US cents/kWh), Uganda (12 US cents/kWh), and South Africa (9 US cents/kWh) (Boulle, 2019). For domestic consumers, the electricity charges range from 12 KShs/kWh for the consumption band up to 100 units to 15.8 KShs/kWh for the band above 100 units

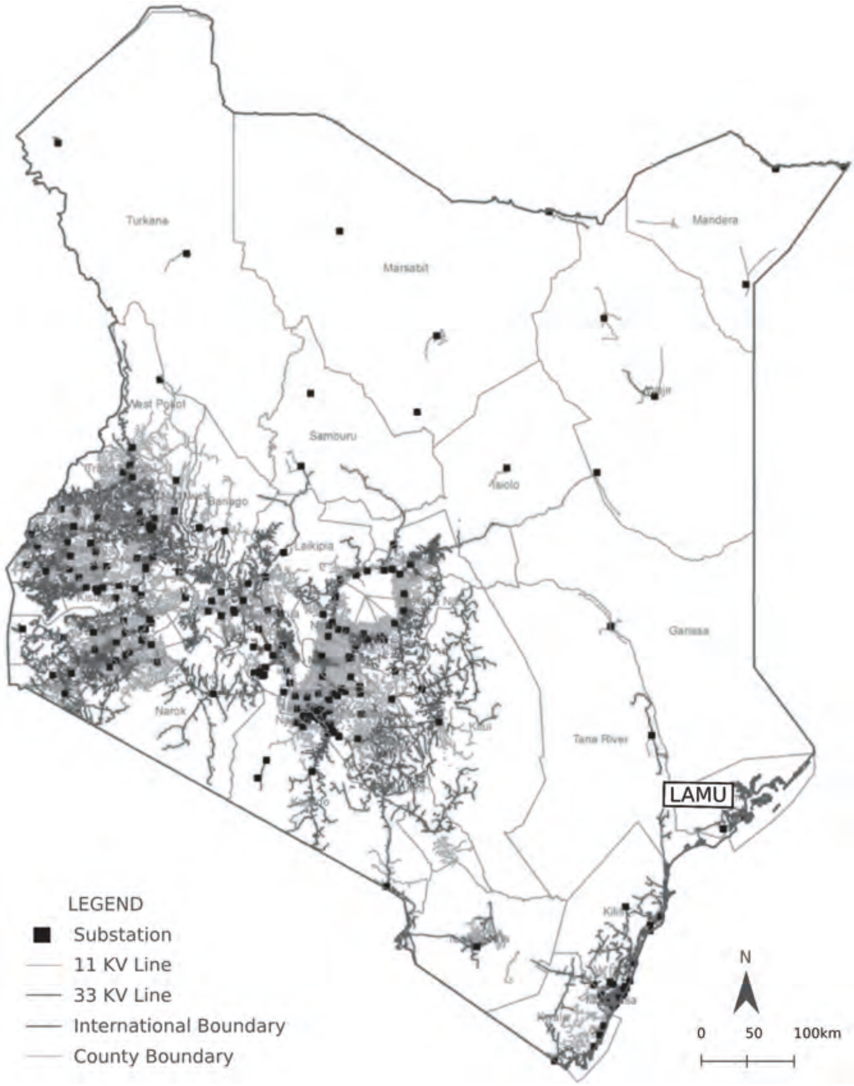

Figure 10.2 Map of distribution lines in Kenya.
Source: MoEP (2018a: 29).

(EPRA, 2018). Coal comes into play as a solution for the generation of cheap, baseload electricity. The PPA signed with Amu Power set the price at 7.5 US cents/kWh, which is comparable to the price of geothermal-based electricity [socint2, socint4].

On the other hand, a comparative analysis of the cost of electricity from coal and geothermal easily refutes the hypothesis of coal as a source of cheap baseload electricity (Kahlen et al., 2019). According to the 2017–2037 LCPDP, geothermal plants will run at an average capacity factor of 77.2% in the reference case, whereas coal plants will run at an average capacity factor of 6.8%. Based on this scenario, the average Levelized Cost of Electricity (LCoE) of future generation is estimated as USD 10.7 cents/kWh for geothermal and a minimum of USD 29.5 cents/kWh for coal (Kahlen et al., 2019).

Since many Kenyan households cannot afford the grid access due to the high connection costs or stay connected given the poor quality of supply, the demand does not grow as quickly as it is projected in strategy chapters in order to justify a coal power plant and the resulting excess supply pushes the prices up [priv1, socint4, socn1, socn2, socn5]. Once coal power plants among other committed energy projects go online, the present installed capacity (of 2.3 GW) is predicted to more than quadruple by 2037, aggravating the market imbalance (LCPDP, 2018).

Diversification of energy mix

Kenya is endowed with rich renewable energy sources, enabling for a green generation mix.[4] As of 2017, over 65% of the installed capacity relies on renewable energy, primarily geothermal and hydro. While wind and solar have limited role in the current generation mix, their share is estimated to rise to 17.1% by 2037 (LCPDP, 2018).

Kenya has a long history of developing geothermal resources, with a high resource potential of around 10 GW along the Kenyan Rift Valley (Kahlen et al., 2019). It is clean and cheaper than coal as well as not subject to an intermittency risk unlike wind, solar, and hydropower. This makes geothermal a reliable source for baseload electricity [socn1].

While the huge potential of geothermal and other renewable sources weakens the support for the construction of a coal plant [socn7], the need to diversify the options of baseload electricity and the intermittency risks of variable renewables favor fossil fuel for energy security (Kahlen et al., 2019) [polit1, polit2].

Industrialization through infrastructure projects

5000+ MW program and LAPSSET project

Energy is considered a crucial sector in the realization of Vision 2030, which seeks to "transform Kenya into a newly industrializing middle-income country providing a high quality life to all its citizens by the year 2030". The Vision set out a long-term development plan, which depends on the continued development of the energy sector in order to support industrialization (Godinho & Eberhard, 2019). Under Vision 2030, the government targets an annual GDP growth rate of 10%, which currently stands at 5.4% (World Bank, 2021). Delivering this ambitious growth aspiration would require the introduction of infrastructure-related flagship projects. Just after coming in office in 2013, President Kenyatta launched an ambitious plan aimed at fast-tracking power generation projects, proposing to add over 5000 MW to the national grid within 40 months. The 5000+ MW program was supposed to raise the total installed capacity from 1664 MW in 2013 to 6762 MW, which is about triple the existing capacity today (Boulle, 2019; MoEP, 2013). Considering the present excess supply (of about 600 MW), many stakeholders believe this ambition being a political decision to benefit a small group of political and business elites close to the administration rather than to meet the demand of the society [socn2, socn3].

Coal was seen as an important component into the development and "future" of the Kenyan state through planned infrastructure projects. Coal was supposed to come into play to deliver 1960 MW of the 5000 MW-capacity by 2037. The government was expecting the infrastructure projects, as part of the 5000+ MW program, to create more demand for electricity and eventually result in a market equilibrium [socn1]. The Lamu Port-South Sudan-Ethiopia Transport (LAPSSET) Corridor is the government's ambitious mega infrastructure project, launched in 2016 with the financial support of China. This mega project aims to link Kenya with Ethiopia, Uganda, and South Sudan, involving the construction of railways and highways between the countries, a new port at Lamu and a crude oil pipeline starting from Lamu.[5] While the LAPSSET corridor was envisaged to create huge demand for electricity that would justify the construction of the Lamu coal plant, the coal power station was supposed to provide power to various parts of this infrastructure project (Boulle, 2019) [socint1]. However, the flagship projects failed to stimulate the demand as projected and the economic growth rate fell well behind the target in the Vision, which exacerbate the oversupply problem in the sector [socint2, socn7].

President Kenyatta's political commitment pledged through the 5000+ MW program was iterated in the "Big Four Agenda", which was announced at the beginning of his second term in 2017. The agenda has four focus areas: food security, health care, affordable housing, and manufacturing, with electricity generation being a key input for manufacturing (Boulle, 2019).

Promoting local coal industry

Following the discovery of the coal reserves in Kitui County, the political commitment to expand electricity generation capacity for economic growth has created a push for the establishment of a local coal industry from coal mining to coal-based electricity generation. In the eyes of the political elites, coal is believed to fuel economic growth, improve the transmission and distribution infrastructure at the coast, and create new jobs along the value chain [socint1, socint2, socn7].

Although the financial justification of the Lamu coal plant was initially to use domestic coal, Kenya has no active coalmine yet and the domestic coal is not of sufficient quality, thereby the Lamu coal plant will run on imported coal from South Africa (Kahlen et al., 2019; MoEP, 2018c) [priv1, socint4, priv4]. That the reality contradicts with the discourse around local coal industry and import independency makes the case against the coal plant easy for anti-coal campaigners [socint1, socint2].

As mentioned earlier, the excess power also weakens the support for the Lamu plant [priv1, socint2]. According to the expansion planning in the LCPDP, the addition of 981-MW Lamu coal plant in 2024 will aggravate the supply-demand imbalance as the surplus margin would surpass 1500 MW being 43% above the sum of peak and required reserve, with 32% excess energy during the year (LCPDP, 2018). To avoid the cited oversupply risk, the proposed installed capacity of the Lamu project has been reduced to 328 MW in the latest revision of the medium-term planning (MTP3, 2018).[6]

Donor dependency

Despite a state-led policy formulation in the energy sector described in the "Energy sector governance: a mix of private sector and state participation" section, Kenyan state-owned enterprises lack the financial capacity to lead the project, which is mostly undertaken by external donors and development partners [socn1]. The involvement of international actors in the project development leaves them a room to influence the policy-making process. This can be either directly through the funding of a certain project or indirectly through sanctions conditioning the financial support on certain criteria [socn4, socn7]. The sanctions might be quite dissuasive for African governments given their dependency on external funding. Unlike IPPs, whose role is rather limited to power generation, international donors, primarily the World Bank, IMF, and European Union are considered influential actors in the policy formulation, including the decision to stop fossil-fuel investments in the region [socn4].

Vested interests and rent-seeking

Coal and link with Kenyan political elites

Given the financial inability of the state-owned enterprises, two local companies with close ties to Kenyan ruling elites leveraged their interests in state power and embarked on the coal project. Amu Power, a consortium made up of two local companies (Centum Investment and Golf Energy) and a Chinese company (China Power) emerged as top players in the construction of the coal plant in Lamu. Neither of the Kenyan companies had an experience in coal plants; Gulf Energy is an investor in the oil and gas sectors and Centum is mostly involved in real-estate investments, besides a power project on the development of geothermal. Chris Kirubi, the owner of the Centum Investment, besides his close relations with Kenyan ruling elites and the first family, is also known for his good connections with high-level politicians within the East African region [socn1, socn2]. A well-known board member of Kirubi's company is

Donald Kaberuka, the former President of the African Development Bank (AfDB), who expressed the Bank's support for the Lamu plant during his service (Boulle, 2019).

The proposed coal power project reflects the broad nature of energy sector deals in Kenya and demonstrates the fact that even with all the euphoria about Kenya's vast renewable energy potential, there is a deep connection between the Kenyan state and fossil-fuel interests from the private sector. Rent-seeking dominates and energy deals are awarded based on connections to political elites as one interviewee put it:

> There's a thriving green energy market in Kenya – Kenya is a leader in the region for green energy, everyone talks about Kenya –, but when you talk about really doing deals and doing them transparently, there isn't a system for getting projects done. It's very top-down, and it's who you know, and not what you know, or what your capacity is.
>
> [priv1]

The same respondent goes on to add that the country has too much electricity already and there is no rationale for building the coal plant but political elites with vested interest are still pushing ahead.

China as the major investor

China emerged as a key player in Kenya during the reign of President Mwai Kibaki and his "Look East" approach, which aimed at attracting financial assistance from China as opposed to traditional western donors. Following Kibaki's legacy, President Kenyatta has established a close relationship with China to meet the need for funding for infrastructure and power projects. The President's support for China's involvement in Kenya began with the "Belt and Road Initiative (BRI)" in 2013. BRI is a plan to connect Asia, Africa, and Europe through infrastructure projects involving the construction of roads, ports, railways, and pipelines (Boulle, 2019). As part of the initiative, Standard Gauge Railway (SGR) project financed by the Chinese Exim Bank was launched between Nairobi and the port of Mombasa. This line is planned to be connected to the Ethiopia-Djibouti railway, as well as to Lamu port and the neighboring countries being part of the LAPSSET corridor (Boulle, 2019).

Reiterating his political support for China's involvement, in May 2017, President Kenyatta signed an agreement with Amu Power and China Power Global for the construction of the Lamu coal power plant. The president's eagerness to cooperate with China in the Lamu project is also linked to the reluctance of western lenders in funding coal projects [socint2, priv1]. Of the USD 2 billion power plant, USD 1.2 billion is secured by the Industrial and Commercial Bank of China (ICBC) and the rest come from shareholder equity of the Amu Power (Boulle, 2019).

China having invested in both Lamu coal plant and LAPSSET project is expected to retain key interests in both projects [socint1, socint4]. The local NGO Save Lamu has recently published a press release citing an official at the ICBC announcing the unexpected withdrawal of the Chinese investor. The decision was allegedly taken due to environmental risks, given that the plant was to operate using dirty, low-quality coal imported from South Africa. Although ICBC has not officially announced it, subsequent news confirms the move (IEA, 2020; Yi, 2021). The withdrawal of China as the main investor cast doubts about the viability of the project.

Environmental sustainability

The role of climate change in energy policies

Kenya is one of the few African countries to have regulations to reduce GHG emissions [socn1]. The environmental concerns linked to carbon emissions and to a larger extent to food and water security are increasingly taken up in energy policy papers [socn1, socn3; socint4]. Following its NDC pledged to the Paris Agreement, the government enacted the National Climate Change Act 2016 and National Climate Change Action Plan (NCCAP) 2018–2022. Henceforth, climate change objectives have been mainstreamed in the sectoral planning. The latest LCPDP is the first planning document showing how the projected generation pathways would influence national GHG emissions up to 2030 (Kurdziel et al., 2019; LCPDP, 2018). However, there is a lack of alignment of the projections of the LCPDP with those of NCCAP, which undermines the relevance of some mitigation actions (Kurdziel et al., 2019).

Despite the increasing role of climate change in energy policy formulation, the implementation of climate actions remains sluggish mainly due to the lack of an efficient mechanism for monitoring, reporting, and verification (Mooldijk et al., 2020) [socn6]. Besides, the uneven distribution of power among different departments and their potential competing interests create a discrepancy in the execution phase [socint3]. The discrepancy becomes evident when it comes to the construction of Lamu coal plant, the exploitation of (oil) wells in the Turkana region, and the infrastructure projects such as the construction of roads and railways run by diesel power [priv3, socint3].

Challenges in the renewables sector

Despite the country's huge potential in the renewables sector and declining costs of the renewable energy technology, existing financial and technical challenges favor pro-coal arguments. The hidden upfront costs associated with the integration of variable renewable energy to the grid system ranks the first amongst other challenges [priv1, socint2, socn2]. In this regard, off-grid technology appears as a complementary solution in particular to electrify remote rural areas out of reach of the grid system, as discussed in the "Electrification of underserved remote areas" section (Moner-Girona et al., 2019).

Financial constraints constitute a key constraint on the development of the off-grid solar market as well. Small and medium enterprises, composing the majority of the market, are generally incapable of accessing international funds, which makes them particularly susceptible to the lack of domestic funding [priv4]. Besides, the off-grid technology is still too costly given the high reliance on imported solar products mainly from China [socint4, socn5, socn6]. While private entrepreneurs lead the market, there is yet no adequate incentive to facilitate their participation. The government is reluctant to provide financial risk guarantee for investing in these nontraditional renewable energy sources. Apart from the feed-in tariff, there is no enabling regulatory framework to ease the issuing of licenses to operationalize the projects and the accession to the credit markets for capital financing [priv2, priv4, socint1, socn3, socn4].

On the demand side, the low demand for off-grid technology stays as a major constraint on the sectoral development [polit1]. The lack of awareness in the society about the effectiveness of off-grid solutions further hinders the demand creation. Many people still believe that solar power cannot work as a source of electricity [priv2, socn3, socn6, socn8]. Such demand- and supply-side challenges prevent the renewable sector from fulfilling its potential, while providing legitimacy for the use of fossil fuel.

The role of civil society in Lamu

Unlike its East African neighbors, Kenya has a very vibrant civil society organization. Besides the NGOs, including Save Lamu, deCoalonize, Green Belt Movement, who have been leading the anti-coal campaign in Lamu, local communities have been an active part of the protests. The vibrant feature of the Kenyan civil society can be linked to the institutional legacy as regards public involvement in the policy formulation process. Any policy both at national and subnational levels involves public participation through consultation and feedback talks before going to the parliament[7] [polit1, polit2, socn3, socn8]. Many stakeholders, however, criticize its effectiveness, as the invitation calls to these meetings reach only a limited segment of the society and some interested parties in certain power projects generally dominate the decision-taking process at the expense of public interests [socn7]. The renewal of PPAs for diesel-powered generators, which were supposed to be switched off due to their high costs, demonstrates the enormous power of private actors and their cronies within the state. Even with their high costs, these PPAs were framed by Kenyan elites as necessity, urgent, and vital national undertakings. The diesel-powered subsector is an integral source of political financing for various competing factions of the Kenyan ruling elites. With next elections scheduled for 2022, the ties between private players and state officials are likely to be strengthened [priv2, socn2].

The effectiveness of public involvement is questionable also because of the strict hierarchies in place in the decision-making. Most of the time neither technocrats nor state officials have a choice other than fully supporting the decision approved by the government. Nevertheless, there is still scope to interfere with the policy formulation [priv2, polit2]. The stop order of the NET for the construction of the Lamu plant illustrates the influential role of the civil society, who drew the attention to the requirements of the environmental impact assessment that had not been performed [socn1]. Eventually, in June 2019, NET canceled the license issued by the National Environmental Management Authority approving the impact assessment and the stop order has been in force since then.

Lamu being a UNESCO heritage site also gave campaigners some international leverage and spotlight resulting in effective combinations of domestic and international pressures [priv1, socn1, socn7]. Anti-coal activists framed their campaign against the coal plant beyond just climate change to include the local adverse impacts of coal on public health and impacts from air pollution, local environmental damage, local fishing industry, as well as corruption and bad governance [priv4, socint2, socint3, socn1].

Following the strong opposition nationwide and its echo on a global scale, many interested parties have abandoned the Lamu project [priv2, socn4, socn7]. This experience points out the importance of ensuring community support to go ahead with the power project that has adverse environmental and health effects (Yi, 2021). Although in August 2017 the AfDB confirmed their interest in providing a partial risk guarantee to support the construction of the power plant in Lamu, shortly afterwards, in November 2019, the Bank's acting vice president declared the withdrawal of their financial support for the coal plant and projected no plans to move forward (Winning, 2019) [socn1]. Subsequent to the AfDB's backstep, General Electric (GE) has declared their exit in September 2020 (Juma, 2020). The involvement of GE was the backbone of the cheap electricity narrative given the supercritical machines and superefficient technology the company would provide [priv1, socn7]. Finally, in November 2020, the main financier of the project, the Chinese investor, allegedly, pulled out the project due to environmental risks. Although there still needs an official declaration by the ICBC about the underlying reason behind their decision, the withdrawal of AfDB and GE as well as the international pressure to exit coal have likely played a role in this decision [socn4]. The move of ICBC might further involve a financial motive as the project is financially too risky to go forward given the inadequate demand for an additional capacity of power [priv1, priv4]. In line with the global trend, the increasing challenges of attracting financial donors to invest in coal seems to remain as one of the drivers for leaving the future of coal in Kenya in doubt.

Policy implications and concluding remarks

This chapter has provided an in-depth case study of the political economy, conflictual climate policy, and the broader economic and political drivers of the policy-making process in the highly contested Kenyan energy sector. We have argued that energy policy-making terrain and implementation of various energy projects is shaped by the nature of the political-economic institutions governing Kenya's energy generation at various competing interests at play. The case study offers a better understanding of various challenges and opportunities facing the Kenyan energy sector, which relate to the four objective categories, universal electricity access and energy security, promotion of industrialization, rent-seeking and vested interests, and environmental sustainability.

As we have shown with respect to Lamu, Kenya's ruling elites' grand national visions and ideas around coal-fired power as the driver for modernity, industrialization, and energy security were met with dissent at the subnational level. Local protests and successful litigation which has so far halted the proposed coal power plant show the power and agency of civil society actors in shaping domestic political economy of energy and climate policy, a new terrain in sub-Saharan Africa. The chapter through the Lamu case study has demonstrated the importance of political mobilization by domestic civil society actors who have so far confronted the powerful private coal consortium and their political backers within the Kenyan state. Local mobilization in Lamu and the emergence of a relatively new breed of domestic anti-fossil-fuel activism in Kenya further highlight the need for recognition and effective participation of local actors especially surrounding communities in the design and implementation of energy projects. Proper inclusion and public engagement will ensure future energy projects get the necessary backing and social license from local actors who are going to be directly affected by their socioeconomic and ecological impacts.

Kenya faces a critical juncture at the time when renewable energy sources are increasingly becoming the backbone of the country's overall energy mix while interests in fossil-fuel energy generation are also increasing as reflected in recent policy pronouncements and various developments strategies discussed in this chapter. While we will not speculate on whatever will happen to the future of Kenya's energy sector, it is clear that competing energy visions will keep unfolding in years to come. The political economy of energy is a crucial analytical element for understanding how such various competing claims and policies in the energy sector are conceived, executed and at times contested by various societal actors at both the national and subnational level.

Recent withdrawal of major commercials banks from Lamu's coal project, which began with South Africa's Standard Bank followed by the AfDB and mostly recently the ICBC and pull out by America's GE, sends a powerful message to the Kenyan political elites and the consortium of local investors that global appetite for coal projects is declining. These recent developments offer Kenya a window of opportunity to reassess its energy aspirations and tap into country's vast renewable energy resources which included geothermal, wind, and solar. The Kenya grid is already one of the cleanest and could become even more cleaner with more renewables and a move away from coal.

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Appendix

This chapter contains supplementary online material at www.mcc-berlin.net/pecoal/ch10.

Notes

1 For a detailed summary of the literature, see Dorband et al. (2020).
2 Of the 18 interviews, 8 societal national members, including NGOs, consultants, think-tanks, and academics, represent the largest group. This is followed by four interviews with the societal international group including international organizations, development corporations, and international academics. Private sector is proportionately represented by four interviews. Policy makers constitute the smallest group in the sample including two interviews. To balance the representativeness of the groups, the interview data were complemented with desk research from official documents, policy papers, newspapers, and scientific reports. See online appendix for the interview questions.
3 These official statistics reported by governmental authorities might differ from other data sources and need to be taken with caution, as they might be overestimated.
4 See online appendix for the details of the power generation mix of Kenya.
5 www.lapsset.go.ke/#1461328897545-6227748f-d226, retrieved on 23.03.2021.
6 For technical details on the changes across strategy papers of targets, capacity factors, and timelines for coal power plants in pipeline, see Boulle (2019) and Godinho and Eberhard (2019).
7 To illustrate, the Ministry of Environment and Forestry has recently published a framework to facilitate civil society engagement and coordination for the implementation of the NCCAP (MoEF, 2020).

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11 Conglomerates and the Department of Energy promote coal development in the Philippines[1]

Niccolò Manych and Michael Jakob

Introduction

The Philippines are among the countries, which are turning into major coal consumers with a current coal pipeline (i.e. plants that are under construction, announced, permitted or under pre-permit development) of 9 GW, of which 2 GW are already under construction (Global Energy Monitor, 2021). This buildup of coal would lock in emissions for decades and severely undermine the transition to a clean energy system in the Philippines.

The need for a transition to renewable energy (RE) in the Philippines and barriers thereof has previously been addressed by several authors. Clark et al. (2020) look at the future of coal-fired power generation and find that aging infrastructure and geographic challenges may make renewables especially appealing in archipelagos like the Philippines. Model scenarios support this finding and demonstrate the potential of RE as a low-carbon energy source that helps to diversify the energy mix and reduce import dependence on fossil fuels (Mondal et al., 2018). Nevertheless, a successful transition to renewables largely depends on the speed and efficiency of energy policy reform (Brahim, 2014), since the current energy market dysfunction hinders the transition (Ahmed, 2019). Yet, Chapman et al. (2019) highlight a lack of political commitment to enable a low-carbon transformation.

Other chapters focus on actors and energy- and climate-related objectives in the Philippines. La Viña et al. (2018) analyze the perceived trade-offs between low-cost energy, reliability and environmental sustainability (i.e. the "energy policy trilemma"). Ravago and Roumasset (2016) argue that these conflicting objectives should be reconciled. Saculsan and Mori (2020) explain the prominent roles of regime incumbents (oligarchs and the government) as well as external actors, in contrast to Marquardt et al. (2016), who highlight the limited influence of international donors. La Viña et al. (2018) emphasize the important role of the government, and Marquardt and Delina (2019) discuss how a community-led social movement prevented the construction of a coal-fired power plant.

However, none of the abovementioned contributions explicitly analyzes the interplay of numerous political economy factors in a systematic manner.

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Hence, our study is, to our knowledge, the first to examine the objectives of political as well as societal actors, the way how the specific country context influences policy-making and how this interplay results in an increasing role of coal in the power sector. We conduct our analysis from the perspective of the AOC ("actors, objectives, context") framework (Jakob et al., 2020) covered in Chapter 1. The analysis in this study uses novel interview data that reveal hitherto unavailable expert knowledge and allows to draw policy implications.

We carried out semi-structured expert interviews as described in Bogner et al. (2014). Drawing on desk research and pre-interviews, which we employed to test our interview guideline, we identified the most relevant stakeholders. In October and November 2019, we carried out 35 interviews with 50 stakeholders in Metro Manila. As only relatively few institutions declined our invitation, we were able to obtain interviews from a broad spectrum of stakeholders. We complied with ethical principles following an internal data management plan. To warrant their anonymity, we ensured all interview partners to publish their statements only in an aggregated and processed form. Refer to Online Appendix[2] for the interview guideline and a list of all interviews.

Our analysis focuses on the interview data and is structured along key objectives. We clustered the objectives mentioned during the interviews into four high-level strategic objectives along which we carry out our analysis. We also draw on existing studies, newspaper articles, reports and announcements to assess whether statements from our interviews are confirmed by other authors' findings and provide additional relevant information. We interviewed several actors with presumably similar opinions to additionally allow for comparison of answers and interviewees. Interviews with researchers from different universities support the validation of answers.

Country context

In the following, we provide information on the historical development of the electricity sector and energy policy-making. We split the development of the electricity sector into four phases. The first three are discussed in the Online Appendix. The ongoing liberalization as the last phase is analyzed hereafter. The rise of coal power, which has been especially pronounced during the past decade, can be seen in Figure 11.1.

The liberalization of the electricity sector

The liberalization of the power sector is ongoing. The Electric Power Industry Reform Act of 2001 initiated unbundling and restructuring and resulted in an oligopoly (Congress of the Philippines, 2001). Consequently, the entire electricity supply chain in the Philippines is dominated by a few large conglomerates (Clark et al., 2020). For a detailed overview of the ownership structure and the conglomerates, refer to the Online Appendix. The Energy Regulatory Commission was founded to promote competition and oversees the Wholesale

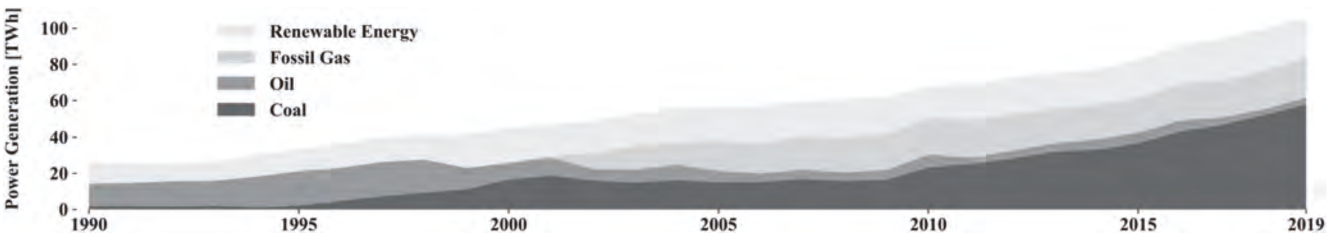

Figure 11.1 Power generation by major energy source, 1990–2019.
Source: Department of Energy (2018b, 2019a).

Electricity Spot Market established in 2006. The market constitutes an alternative to Power Supply Agreements (PSAs), as Power Purchase Agreements are referred to in the Philippines. The Renewable Energy Act of 2008 is considered the first in Southeast Asia to act as comprehensive legislation on RE (IRENA, 2017). It mandated the Department of Energy (DOE) and the Energy Regulatory Commission to introduce a range of policy instruments like feed-in tariffs, net-metering and Renewable Portfolio Standards (Congress of the Philippines, 2008). The DOE develops the Philippine Energy Plan, which is seen as important guidance for the power sector. The most comprehensive version covers the period 2017–2040 and features a strong focus on coal (Department of Energy, 2017b, 2017a).

Energy policy formulation, implementation and enforcement

All three branches of government in the Philippines as well as societal actors play a part in the electricity sector governance. The legislative branch includes the Congress, which consists of the Senate and the House of Representatives. Political parties play a negligible role in Congress (Dressel, 2011). Energy laws are often proposed by the Senate's committee on energy, lobby groups or executive departments (Senate of the Philippines, 2019a). The executive branch includes the president, who serves a six-year term and cannot be reelected, the cabinet, 20 executive departments and multiple boards and commissions (National Government Portal, n.d.). The president occupies a very powerful position (Quimpo, 2007) and can pass executive orders, which has been the case in the electricity sector (President of the Philippines, 2017). The most important department for the power sector is the DOE. It oversees the implementation of laws and translates these into policies, often after consulting the private sector (Department of Energy, 2020b). NGOs and economic actors frequently file lawsuits against regulations in the power sector. The civil society moreover opposes power plants on the ground, which in many cases met with violence (global witness, 2019). Local Governmental Units hold executive and legislative powers.

The separation of power is in practice undermined by oligarchic structures and powerful elites. President Duterte recently claimed that he "dismantled the oligarchy that controlled the country's economy" (CNN Philippines, 2020), which is contested (Lorenzana, 2020). Economic and political power lies in the hands of few families, rooted in colonial rule (McCoy, 2017). The importance of the family is incorporated in the "Padrino System" that governs the Filipino society (Wong, 2010). This results in political dynasties that make up the majority of elected representatives on the national level (Mendoza et al., 2012; Purdey et al., 2016). Elites further dominate the decision-making on local levels (Yilmaz & Venugopal, 2013).

Results

A variety of objectives influencing decision-making in the electricity sector were mentioned by the interviewees (see Online Appendix for a table of all objectives). We grouped these individual objectives into four main high-level objectives: Reducing energy poverty, energy security, ecological sustainability and private profits. This represents the energy policy trilemma with one additional objective for vested interests of conglomerates. Key actors in the electricity sector include political actors (denoted as "p" throughout the study) and societal actors. The latter is divided into economic actors ("e"), other societal actors international such as international agencies ("si"), and other societal actors national, for example, NGOs and researchers ("sn"). Figure 11.2 shows the share of interviewees from each actor group that mentioned each respective objective. The graph allows differentiating between objectives stated as being relevant for the decision-making in the power sector in general (a) and the interviewees' (or their institutions') own goals (b). This differentiation sheds some light on the discrepancy between officially announced and perceived objectives.

Each mentioned objective within the four main objectives is analyzed hereafter with a focus on relevant actors, related policy instruments and the impact on the development of coal. Where identified, we additionally mention why a specific objective is relevant to an actor.

Reducing energy poverty

Two sub-objectives of reducing energy poverty were raised by the interviewees, expanding electricity access and ensuring affordable electricity. These are interlinked, as often the most expensive electricity is provided to the poorest households in rural areas and regions with lower income are more often experiencing a lack of access to electricity and electric devices (Mendoza et al., 2019). While the goal of electricity access favors the use of renewables, affordability is often used as an argument for coal.

Expanding electricity access

Electrification in the Philippines is primarily driven by political actors through RE. In 2019, around 1.5 million households out of the total number of 22.7 million were not connected to the power grid, foremost in rural areas in Mindanao (Department of Energy, 2018a). Electrification is in most cases not profitable for the private sector and thus initiated by the government and consumer-owned electric cooperatives for human development and economic growth [sn3, si3]. It is also seen as a measure to improve the conditions in rural areas in order to decongest Metro Manila [si2]. The DOE (2017e) thus aims at achieving 100% electrification by 2022 for households with grid access, while all off-grid areas are envisaged to have electricity access by 2040. The

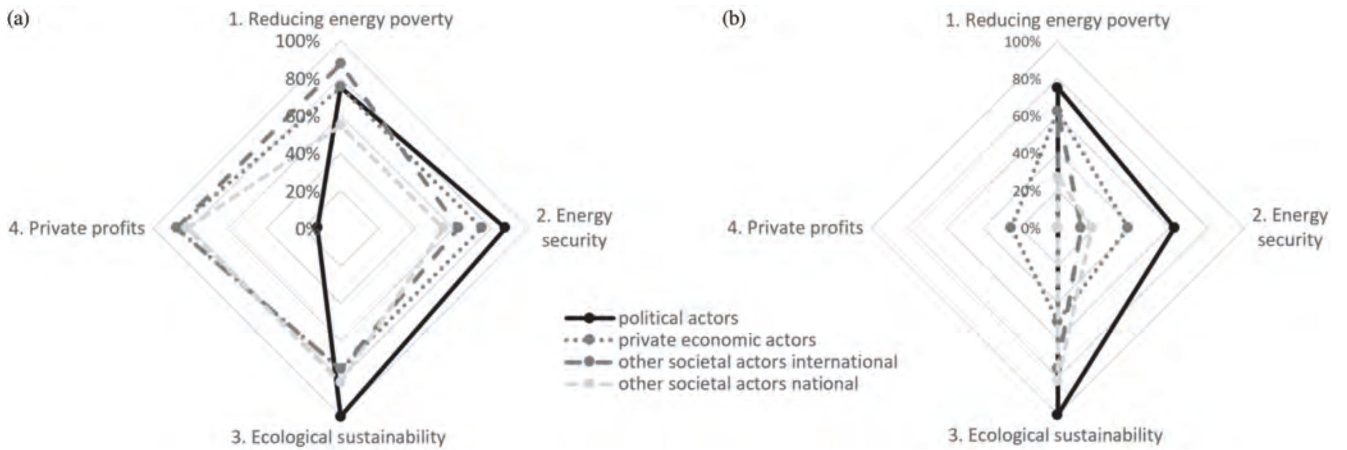

Figure 11.2 Share of interviewees from each group referring to the four main objectives affecting the power sector.

Note: (a) shows the objectives that interviewees stated as being important for the decision-making in general, which includes perceived objectives of other actors, (b) shows the objectives mentioned by the interviewees as their own objectives or those of their institutions.

two main agencies to perform the rural electrification are the National Power Corporation and the National Electrification Administration with support of international agencies (GIZ, 2019). To increase electricity access, the government supports microgrids (Senate of the Philippines, 2019b) as this objective can be best achieved with decentralized RE (Bertheau & Cader, 2019) [si3, e5, si8, si5].

Affordability

The Philippines are subject to high electricity prices for various reasons, for example, the oligarchic structure in the electricity sector. At around 0.20 US$/kWh, tariffs are among the highest in Asia (Ahmed, 2019). This constitutes difficulties for private consumers and the manufacturing sector (Ravago et al., 2016, 2019) [p1]. Stated reasons for the high prices include expensive PSAs with foreign generation companies in the 1990s to overcome power crises [si2], high feed-in tariffs (La Viña et al., 2018), as well as charges for rural electrification and the National Power Corporation's outstanding debt (Congress of the Philippines, 2001). Another reason is the lack of competition in the power sector. The Electric Power Industry Reform Act aimed at liberalizing the market and reducing tariffs but actually "consolidated the sector into the hands of a few companies" [si6] while tariffs remained high. One of the reasons is that many of the government's privatized power plants were purchased by incumbents (Rudnick & Velasquez, 2019). The resulting oligarchy controls the sector and does not promote competition (Roxas & Santiago, 2010). Market entry of new players is in addition hampered by red tape [p4, e7] and regulatory uncertainty [e3].

Various policies have been passed to cut electricity tariffs – with limited success. The DOE sets limitations for market shares of companies, for example, 25% of the total installed capacity in the national grid for generation (Department of Energy, 2018a). President Duterte highlighted the need to further open up the market for international players (Ong & Flores, 2016). The DOE (2017c) published a report on "Investment Opportunities in the Philippine Energy Sector", which explicitly invites foreign companies to enter the market. Maniego Jr. (2016) argues that, especially for RE, domestic companies have not yet gained sufficient experience and rely on foreign developers. The independent, quasi-judicial Energy Regulatory Commission – one of the most important actors when it comes to tariffs, which sets rates and approves PSAs – oversees all companies and the spot market and penalizes abuse of market power [p4]. The Energy Regulatory Commission passed net-metering regulations for electricity that is produced by consumers, for example, by means of solar home systems (Energy Regulatory Commission, 2013). However, the electricity is sold for blended generation charges, while the consumers have to pay the full price. This reduces the economic incentives for consumers and benefits distribution utilities [e5]. Thus, even though Congress passes laws to bring down tariffs and enhance competition, the implementation by the DOE and the Energy Regulatory Commission is flawed and tariffs remain high.

The high tariffs are used as an argument for coal because coal is by many perceived as the cheapest option. The highest share of the average consumer prices is generation charges of almost 50% (Ravago et al., 2016). PSAs for coal currently often have lower rates compared to other baseload resources such as geothermal, hydropower and gas (La Viña et al., 2018). Nevertheless, the actual costs of coal power can be higher, as the rates in the PSAs for coal are not fixed and fluctuations of fuel costs are directly passed on to consumers, which is referred to as "automatic pass-through" [e5, sn10, p2, sn9]. The socioeconomic cost of coal, pricing in environmental and health externalities, is much higher than that of alternative sources [e5, p2, sn9]. In the past, some PSAs for solar have already been set at lower rates compared to coal (Shearer et al., 2018). Solar and wind plants have further reduced the spot market prices (Verzola et al., 2017). Gray et al. (2018) project that, before the end of this decade, it will be cheaper to build new solar capacity than to run existing coal plants. However, coal is still perceived as cheap by many politicians [si1, e6, p3], which can partly be explained by a study funded by the United States Agency for International Development (USAID) (Ravago et al., 2016) [sn3]. The authors argue that the share of coal in the Philippines' electricity mix should increase in order to bring down electricity tariffs. This opinion is shared, for example, by the Chamber of Commerce and Industry (The Philippine Star, 2017), the National Economic and Development Authority (2017) and president Duterte (Ong & Flores, 2016). The objective of decreasing tariffs is thus a strong driver of coal.

Energy security

Three subcategories of energy security were mentioned by the interviewees: Grid stability and meeting growing electricity demand are drivers of coal, whereas reducing import dependency is favoring RE.

Reliability and grid stability

Power outages are a regular problem in the Philippines and their avoidance is thus high on the political agenda [si4, sn9, si2]. Outages occur due to increasing demand during the summer months [e5] and technical problems of coal plants (Department of Energy, 2019b). The Philippines cannot import electricity from neighboring countries to offset supply and demand shocks [sn11, e4]. Another difficulty is the three separate main grids in Luzon, Visayas and Mindanao, which are accompanied by a great number of microgrids (Bertheau & Cader, 2019). The DOE tried to improve the situation by interconnecting the Luzon and Visayas grids (Department of Energy, 2018a), even though the capacity of the interconnection line might already be too small [e4]. The DOE aims at creating an integrated system for the whole archipelago within its Transmission Master

Plan, which could help to balance the oversupply of electricity on Mindanao with the lack of capacity in the north [sn11, e6].

To increase grid stability, the DOE favors large, non-intermittent baseload capacity [si4, sn11, p2, si3, sn2]. The baseload and reserve requirements have recently been increased (National Economic and Development Authority, 2017; Verzola, 2018). Some interview partners advocated the current approach [p5, e8, sn9]. Others stated that the DOE is clearly overestimating the country's baseload demand [sn5, si1, e1, si5, sn6, si3, e3]. One politician mentioned a new study that finds that the baseload requirement is actually lower than currently assumed [p8].

The DOE sees coal as a source to avoid power outages [sn7, sn5, si6], which also has to do with the lack of alternatives for baseload. Untapped geothermal capacity is often not viable due to economic or technical constraints [sn11, p7, p8]. The Nuclear Energy Program Implementing Organization was created in 2016 and is considering a collaboration with Russia (Romero, 2019). However, the Philippines frequently experience earthquakes [sn6] and show public resistance because of a nuclear power plant constructed during the Marcos era [si5]. The usage of liquefied natural gas (LNG) in anticipation of the depletion of the Malampaya gas field is on the energy agenda (Department of Energy, 2017e). A gas hub is therefore planned in the Batangas province [p8, e4]. None of these alternatives to coal is currently sufficiently available or expected to be so in the near future [p3, e4, si4, sn11]. The focus on baseload capacity creates a "vicious circle" [si1]: Due to the high share of firm coal in the electricity mix, intermittent RE can affect the grid stability (National Economic and Development Authority, 2017).

Meet growing demand

The Philippines is one of the fastest growing economies in Asia, which is perceived by many actors to be linked to coal. While the population grew by 1.7% on average per year from 2000 to 2018, the annual GDP growth rate for the same period was 8.1% (The World Bank, 2019a, 2019b). Power generation in the Philippines grew on average by 4.9% annually from 1990 to 2019 (Department of Energy, 2018b, 2019a). In line with still low electricity consumption per capita compared to neighboring countries (The World Bank, 2014), the DOE's Philippine Energy Plan (2017d) projects a yearly increase in total consumption of 4% until 2040. This is backed by academic findings, for example, by Ravago et al. (2018). While the electricity supply from renewables is projected to increase by around 1.5% annually until 2040, coal supply (mostly for power generation) is expected to increase by around 6% per year in the same period (Department of Energy, 2017b). New energy infrastructure is part of Duterte's overarching goal of economic development (Build Build Build, 2018), which is also important for political actors in the energy sector, like the Climate Change Commission and the DOE [si3, p6, si4]. One political actor told us that "our policy supports the economic agenda of the country" [p5]. At the same time, coal is seen as a prerequisite for economic development [e4, sn4, p6, sn7, e8]. This is in accordance with the large capacity of coal plants currently in the pipeline as shown in Figure 11.3.

Meeting the rapidly growing electricity demand is important for many political actors and is fostered through several policies that benefit coal. President Duterte (2020) and the National Economic and Development Authority (2017) promote the development of new power capacity. Instruments that streamline the application process of power projects are passed by the legislative (Congress of the Philippines, 2019) and the president in an executive order (President of the Philippines, 2017). The latter requires attributes that are hard to fulfill for RE projects, for example, the financial volume [sn4, sn9]. The DOE has shifted to a technology-neutral approach to increase capacity [si4, p2, p8, si4]. Together with the formerly mentioned baseload focus, this favors coal due to the current lack of alternatives for baseload energy [e3, p3, si7, sn5, si1, si5]. Furthermore, the government explicitly fosters the cooperation with foreign companies for coal: The Philippines are part of the Association of Southeast Asian Nations (ASEAN) Forum on Coal to enhance cooperation in the coal sector (Department of Energy, 2017e) and have partnered with the Japan Coal Energy Center for "technology transfer of Japan's [. . .] coal-fired power plants" (Department of Energy, 2017e). Policies favoring coal are in line with the abovementioned DOE's projections of RE and coal demand.

Reduce dependence on energy imports

Increasing self-sufficiency is an important argument in favor of RE and against coal and was stated foremost by political actors [p5, p1, p8]. The Philippines have few domestic coal and oil resources and rely heavily on imports. The current domestic coal production stemming from Semirara Island is mostly exported to China [p7]. At the same time, about 85% of the coal for the power sector is imported, almost exclusively from Indonesia (Department of Energy, 2020a). This creates a large market with 71 accredited coal traders in 2019 (Department of Energy, 2020d). Imports lead to a dependence on other countries and exposure to international market price fluctuations (La Viña et al., 2018). Self-sufficiency dropped in recent years due to increased usage of imported coal (Department of Energy, 2020c). The DOE (2017d) pursues the goal of attaining energy independence within its Philippine Energy Plan. This could be achieved with wind and solar as their potential domestic capacity is sufficient to power the country (IRENA, 2017).

Ecological sustainability

Two sub-objectives of ecological sustainability were mentioned, both of which promote RE over coal. However, the impact of these objectives is questionable.

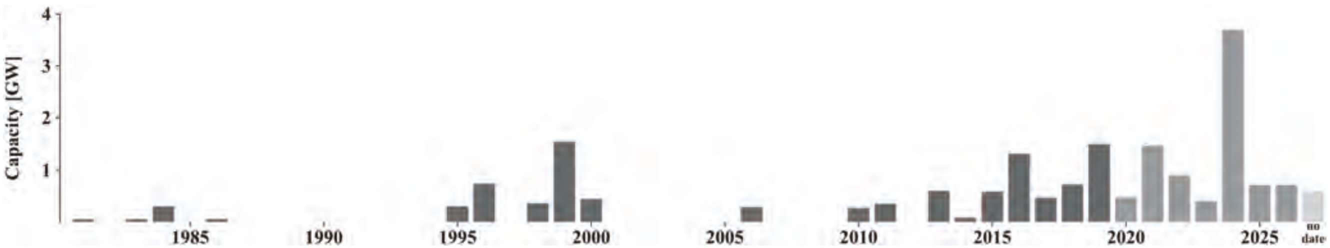

Figure 11.3 Capacity additions from coal-fired power plants per year.

Note: Plants from 2020 onward are currently in the pipeline.

Source: Own graph with data from the Global Energy Monitor (2021).

Climate change mitigation and adaptation

The objective of adaptation is well aligned with the country's vulnerability to climate impacts and clearly favors RE. The Philippines are already today among the countries most affected by weather-related loss events (La Viña et al., 2018). Global warming will further increase the risk and occurrence of natural disasters (Fuentes Hutfilter et al., 2019; Holden, 2018) and exacerbate existing inequalities [si6]. This can be counteracted by several mechanisms to strengthen communities and local groups, especially indigenous communities [sn5, p5, sn10, p4]. Interviewees mentioned decentralized systems with renewables as the most promising approach to increase adaptive capacity [sn5, si6, e5, sn10, p6].

In light of the severe risk that climate change poses, different political and societal actors support mitigation policies. Local actions are often initiated by NGOs and social movements [sn10, sn4, si6]. Some Local Governmental Units, for example, on Negros, declared their provinces coal-free in order to ease the impact of climate change [sn5]. On a national level, the DOE set energy efficiency goals for each sector, aiming at a total reduction of 40% of energy intensity (compared to 2010 baseline) by 2030 (Department of Energy, 2016). The main policy body is the Climate Change Commission that develops mitigation frameworks and represents the country at all conferences and events on climate change (Climate Change Commission, 2012). The Climate Change Commission (and the Philippines in general) played an important role in securing the 1.5°C temperature target in the Paris Agreement with the Manila-Paris Declaration (Climate Vulnerable Forum, 2015): "the road to Paris started in Manila" [p6]. The Philippines' Intended Nationally Determined Contribution includes a 70% of reduction (not specified by sector) by 2030 compared to the business-as-usual (BAU) scenario (which is likewise not specified) conditional on international financial support (Republic of the Philippines, 2015). More information on sustainable finance can be found in the Online Appendix.

The significance of those actions and their impact on coal is questionable. As of March 2021, the Philippines have not submitted their Nationally Determined Contribution (UNFCCC, 2020). Domestic emissions grew rapidly from 37 $MtCO_2e$ in 1990 to 123 $MtCO_2e$ in 2018 and are projected to increase further to reach 346 $MtCO_2e$ in 2040 even under the government's Clean Energy Scenario (and 397 $MtCO_2e$ in the BAU case) (Department of Energy, 2018b). The expected increase is primarily driven by power generation, which accounted for 52% – and more specifically by coal that accounted for 51% of the emissions in 2018 (Department of Energy, 2020c). This corresponds to the opinion of the Climate Change Commission (2012), the DOE (2020c) and many (political) interview partners that the Philippines are not responsible to limit their emissions due to their much lower historical emissions compared to industrialized nations [p5, p6, p8, p7].

Reducing local air and water pollution

Regardless of the support from society and NGOs, reducing local air and water pollution does not seem to influence national energy policy-making much. In the World Values Survey (2014), almost two-thirds of interviewed Filipinos agreed that it is important to protect the environment, even if this hampers economic growth. Two policies to enhance the quality of the environment are the Fisheries Code and the Philippine Clean Air Act. The latter recognizes the polluter pays principle and allows citizens to file an action in court against persons violating this act (Congress of the Philippines, 1999). The Environmental Impact Assessment for coal plants could restrict the construction of polluting coal plants [sn2, p4]. However, its review manual states that the "pursuit of socio-economic development has equally important consideration for environmental protection" (Department of Environment and Natural Resources, 2007). The Philippine Clean Air act recommends the Department of Environment and Natural Resources to review emission standards every two years, which has not happened thus far and leads to weak standards for coal plants coupled with a lack of reliable monitoring stations [sn4]. One of the stated reasons for the lack of serious action is that the transport sectors – especially cars – are deemed to be the bigger threat to people's health and the environment [p8, e6, e4]. Thus, the negative impacts from coal plants are projected to increase in the future (Koplitz et al., 2017).

Private profits

Economic actors have vested interests in the power sector. The objective of making profits of conglomerates – comprising energy companies and banks – is often pursued with coal. While some conglomerates historically focused on RE or fossil gas, the majority associates coal with large profits [sn1, si4, p7]. For generation companies, that is, for instance, due to the absence of price risk resulting from the automatic pass-through [si5], which ensures stable cash inflow from running coal plants (Ahmed, 2019). Other market distortions benefiting coal are neglecting external costs [e1, sn9] and easier application processes [si1]. Coal plants further allow for bigger margins due to their size, because "the bigger the project, the bigger the profit" [p7]. The profitable conditions for coal are accompanied by regulatory uncertainty for RE, for example, the Philippine feed-in tariffs' tight deadlines (Barroco & Herrera, 2019).

Filipino banks seem to be more comfortable with financing coal projects than RE. The Philippines have a high credit rating and the domestic banks are highly liquid (Fitch Ratings, 2019, 2020) [si7, si2, e2]. Multilateral Development Banks rarely substitute domestic banks [e3, si2] and most Filipino coal developers are financed domestically (urgewald e.V., 2019). Wind and solar are often small projects with low margins [si2] and hold intrinsic uncertainty (Barroco & Herrera, 2019). The latter manifests in high risks, for example, due to lengthy processes and the work with small, unexperienced local groups [si2, e7, e6, si5].

The banks themselves have limited experience with wind and solar [si7, p1, sn9, e7]. Furthermore, wind and solar are often merchant plants without PSAs that have to take the risk of the spot market [si1, si2, e6]. Banks, however, expect a PSA before providing financing, and for developers, it is difficult to close a PSA without financing [si1]. In the words of one interviewee, "PSA and financing for RE is like chicken and egg" [e1]. Thus, while companies see large stable profits in coal, investment in RE is considered less reliable.

Oligarchs owning the conglomerates and banks not only control the supply and demand of electricity but also influence policy-making in favor of coal [p1, p7, sn10, e4, sn8]. This is referred to as "regulatory capture" [si8] and "business and political entanglement" [sn1]. The conglomerates influence many of the legal and political institutions (Roxas & Santiago, 2010), for example, by bankrolling electoral campaigns of politicians [sn5, p5, p7]. The companies can also directly take part in policy formulation [e2, p3]; Meralco, for instance, submitted comments on the net-metering rules (Energy Regulatory Commission, 2013). An example of lobbying is a recent coal tax reform that the Department of Finance promoted over the DOE with the main objective of increasing revenue for the "Build, Build, Build" program [sn7, sn9].[3] It was altered after lobbying from the private sector, especially from the oligarchs in the domestic mining sector (Cabuag, 2017; Jiao, 2017) [sn10].[4] An organization that brings together owners of different conglomerates is the Makati Business Club, one of the most prominent industry organizations with strong ties to politics [p5]. The conglomerates can further influence the discussion by creating pro-coal narratives that are taken up by the society and politicians [e6].

Discussion and policy implications

Coal use in the Filipino power sector is rising as a result of the interplay of various political economy factors. In the following, we describe why the arguments in favor of coal prevail against those in favor of alternative energy sources, such as renewables, and discuss how this is reflected in the recent policy process. We then provide some tentative conclusions on how the country's dependence on coal could be reduced. Finally, we discuss the effects of recent developments, in particular the COVID-19 pandemic.

Conflicting objectives

We identify a variety of objectives affecting decision-making in the power sector – those supporting the construction of coal-fired power plants are prevailing. Civil society actors advocate for a just transition to RE. This is in line with the country's high vulnerability to climate change and obvious advantages of renewables in terms of import dependence, local air and water pollution as well as comparatively low costs, especially for the provision of electricity access in remote areas. By contrast, most oligarchs in the power sector favor coal in view of the associated profits [sn1, si4, p7]. They own large conglomerates comprising generation companies as well as banks and influence policy-making [p1, sn10, e4, sn8]. The president and the DOE rely on the support of the oligarchs (McCoy, 2017) [sn5, p5, sn1] and support the construction of coal plants. Coal is seen as a prerequisite to meet the projected demand growth for economic development in general [sn4, p6, sn7, e8]: "We are predominantly growing through coal" [e4]. This is reflected in the sustainable framework of the central bank, which "supports economic growth […] while reducing pressure on the environment" (Bangko Sentral ng Pilipinas, 2020) and thus prioritizes growth over environmental concerns. These conflicting objectives are also present on the local level, for example, in the province of Palawan: The construction of a coal plant has, after years of resistance by the civil society (Marquardt, 2015), been approved by the local government in 2019 because of a lack of electricity supply [sn5, si5, p9].[5] In line with the strong influence of conglomerates, the president and the DOE on energy policy formulation, sustainability often has to take a back seat to other objectives, which results in the buildup of coal-fired electricity generation.

Policy process

Public officials show reluctance to implement effective policies to initiate the transition to renewables and additionally foster competition in the power sector, among others due to the influence of powerful conglomerates. The Congress passed multiple laws, but the implementing rules and regulations by the DOE or other departments are often flawed and delayed [sn6, sn11, si8, si5, p2, p4]. Examples are the Electric Power Industry Reform Act from 2001 that aimed at the liberalization of the power sector and the Renewable Energy Act from 2008. Both are still not fully implemented [e5, sn6]. One stated reason is inertia due to the sheer number of involved stakeholders and the lack of coordination between them [sn2, si3, sn6]. Another reason is the power of oligarchs as demonstrated in the following example. The Competitive Selection Process for Power Supply Agreements (Department of Energy, 2015, 2018c) should reduce electricity prices and prevent "sweetheart deals", for example, between Meralco and their wholly owned generation company MGen [si8, p1]. The implementation was illegally postponed for ten months by the Energy Regulatory Commission (Supreme Court of the Philippines, 2019). In that time span, many PSAs were signed, including seven Meralco-affiliated agreements for more than 3500 GW of coal capacity – which then did not necessarily have the lowest costs [sn10, si8]. All four commissioners of the Energy Regulatory Commission were suspended because they were found guilty of giving benefits to Meralco and other companies (Nonato, 2017) [p7].

Lessons for reducing coal dependence

Policies to reduce the country's dependence on coal need to take the objectives of the most influential actors into account. One important finding of this study is the reluctance of many conglomerates to invest in renewables. Continuous declines in the costs of RE technologies could provide an important rationale for increased uptake in the future purely based on profit motives, that is even without taking benefits for the climate, local environmental quality as well as energy security into account. In addition, investments in RE could be incentivized by renewable resource maps by the DOE to guide investors [p6], long-term policy planning to reduce regulatory uncertainty [e3, sn10, e4, sn11, sn2] and de-risking mechanisms, for example, governmental collaterals [e1, e6, si2]. Interviewees further recommended to level the playing field, that is reducing artificial advantages for coal, such as the pass-through provisions for price fluctuations [si1, e5, si5, sn6, sn9, e8]. Options in this direction are fixed-price deliveries for PSAs [e1]. These can probably only be implemented if they are designed in a way that allows conglomerates to maintain their profits.

The future of the electricity sector

The future development of the power sector in the Philippines is uncertain. The US$ 3.4 billion fund for economic stimulus and pandemic response does not contain dedicated green funding (Congress of the Philippines, 2020). However, the DOE stated in October 2020 that it will no longer accept applications for new coal plants (Lagare, 2020), lasting until the department determines the need for additional supply (The Online Citizen, 2020). On the international level, momentum for ambitious climate change mitigation measures is building up as major players, such as the EU, China, Japan as well as the new US president Joe Biden, have announced plans for "net zero" emissions. These global developments might also have repercussions for energy and climate policies in the Philippines. Policy-makers might hence now have a window of opportunity to lay the foundation for a clean energy transition.

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Appendix

This chapter contains supplementary online material at https://www.mcc-berlin.net/pecoal/ch11.

Notes

1 This chapter draws on the article Manych and Jakob (2021). We gratefully acknowledge permission to reproduce parts of the content from Elsevier.
2 This chapter contains supplementary online material at mcc-berlin.net/pecoal/ch11.
3 The impact of the tax hike on the electricity tariffs is to this point unknown.
4 Another example is Solar Para Sa Bayan run by the son of then-senator Loren Legarda, which got a franchise for solar microgrids in non-serviced areas (Congress of the Philippines, 2018) [sn3, sn10].
5 Environmental groups together with the local community went to court to stop the construction (Chavez, 2020). The results are pending.

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12 Unraveling the political economy of coal

Insights from Vietnam[1]

Ira Irina Dorband, Michael Jakob, and Jan C. Steckel

Introduction

Vietnam envisages a substantial ramp-up of coal-fired electricity generation capacity to fuel its economic growth based on energy-intensive production (Tang et al., 2016). With a projected installed capacity of more than 49 GW by 2030, coal capacity would more than quadruple from 2015 levels (c.f. Figure 12.1). However, these investments in coal in Vietnam are far from obvious from an environmental or a purely techno-economic perspective as they entail large public health costs, increased import dependence and underuse of the country's large potential of renewable electricity generation (Koplitz et al., 2017; Nangia, 2019; UNDP, 2019). As we demonstrate in this chapter, Vietnam's climate and energy policies are to a large part determined by political economy factors, such as the Communist Party's urge to assert its power and the influence of incumbent interest groups.

Since Vietnam's reunification in 1976, the Communist Party of Vietnam (CPV) has been ruling in a one-party regime. During the past three decades of fast and energy-intensive economic growth, Vietnam passed the middle-income country threshold in 2011 (World Bank, 2019b), while electricity demand grew by 10–11 percent per year on average. Despite continued privatization and reform efforts, industrial sectors, including the electricity market, remain largely government-controlled. The type and location of new power plants included in the five-year power development plans (PDPs) are centrally decided by the Ministry of Industry and Trade ("Energy Ministry" ff.) and its provincial counterparts. The state-owned monopoly utility Vietnam Electricity (EVN) under the Energy Ministry functions as a single buyer of electricity and controls most of the transmission; together with two other state-owned enterprises (SOEs) in the energy sector, it controls 90 percent of generation capacity (ADB, 2015). The Online Appendix provides a detailed country background.

In this interview-based case study, we aim to identify the political factors that shape Vietnam's climate and energy policies, shedding light on otherwise hidden interrelations, vested interests and underlying power struggles behind Vietnam's coal plans. The literature identifies three high-level political goals that

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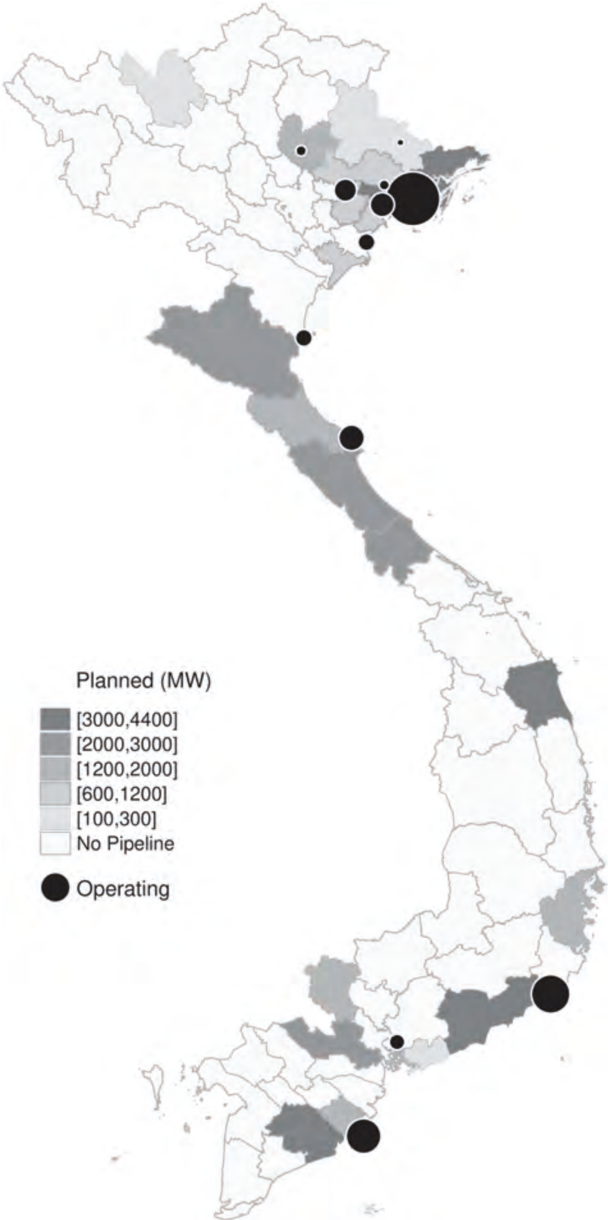

Figure 12.1 Operating and planned coal-fired electricity generation capacity in Vietnam until 2030.

Note: total operating 18 GW; "planned" subsumes announced, pre-permitted, permitted and plants under construction.

Source: Shearer et al. (2020).

are primarily guiding national energy policy, affordability, security of supply and (environmental) sustainability (c.f. Joas et al., 2016; Johnstone et al., 2017; Schmidt et al., 2019), as well as, fourth, the promotion of the domestic energy industry (Jenkins, 2014; Schmidt et al., 2019). Focusing on the political perspective, we explain how these four general goals of energy policy translate into the choice for coal in Vietnam.

There are some studies analyzing climate and energy policies in Vietnam, and some studies examining the political economy of coal in other countries. However, to our knowledge, there is no systematic analysis of the complex entanglement of domestic and international interests and stakeholders around the coal sector in Vietnam. In interview-based analyses, Urban et al. (2018) identify the legislative shortcomings, but not the underlying political determinants, of the various existing sustainability and energy strategies from an environmental justice perspective. Examining the drivers for passing these strategies, Zimmer et al. (2015) emphasize the role of international agencies and briefly discuss how close ties and potential vested interests between ruling elites and energy state-owned enterprises (SOEs) might hamper the strategies' implementation. In a detailed analysis of Vietnamese energy sector developments, Neefjes and Thi Thu Hoai (2017) find that the Energy Ministry and fossil energy SOEs together have the greatest agency in promoting coal. They also point out that civil society organizations exert weak influence. Our study is the first to systematically tease out the underlying objectives of domestic and international actors, the way in which Vietnam's governance context allows them to influence policymaking and how this constellation results in the increasing use of coal in Vietnam's power sector.

Method

In order to make our approach as transparent as possible, we follow the best practice for qualitative data collection (c.f. Bogner et al., 2018) and build our analysis on the political economy framework (Jakob et al., 2020) further explained in Chapter 1. For the purpose of empirical data collection in Vietnam, we operationalized the theoretical framework in qualitative semi-structured expert interviews, following the approach described by Bogner et al. (2018). Relevant stakeholders in Vietnam were identified based on desk research and pre-interviews, which also served to test and improve the interview guideline. In April 2018, we interviewed 30 stakeholders in 25 semi-structured interviews in Hanoi and Ho Chi Minh City. Very few institutions declined our invitation, so, with the exception of two SOEs, we gathered data across a broad sample of stakeholders (refer to Online Appendix for Table A12.1 of interviews by sector). Finally, we distilled and synthesized the key insights informing our research questions from the interview transcripts and notes.[2]

In order for this analysis to minimize research bias, we exclude normative or opinion-based statements if they are only brought forward by one interviewee and could not be supported by secondary sources, such as news articles or grey literature reports. However, distinguishing between opinion- and fact-based information is partially based on the authors' judgment because "objective" information on many aspects of Vietnam's energy sector and climate policy remains scarce due to the lack of transparency and disclosure – which in itself is part of the motivation for this case study.

Results: political economy determinants of coal use

Vietnam's focus on coal as the main source of electricity generation is driven by a complex web of actors and institutions with different objectives and means of political influence, embedded in the overall socio-economic and political context. In the following, we analyze how the choice for coal is determined by the interplay between the key actors shaping Vietnam's climate and energy policies. These include ministries and political institutions (political (p)), businesses and investors (business (b)), domestic civil society (societal national (sn)) and international organizations (societal international (si)) (c.f. Table A12.1 in Online Appendix). In our interviews, these actor groups mentioned a variety of objectives influencing Vietnam's electricity policy. We cluster these into four high-level strategic objectives: affordability, security of supply, the promotion of the domestic energy industry and personal interests, as well as climate and environmental considerations.

Figure 12.2 depicts the share of interviewees in each group who mentioned the respective high-level energy policy objective to strongly influence energy decisions in Vietnam. These do not necessarily coincide with their own priorities. Even though this simple counting does not allow for directly inferring the true importance of a certain objective, it is useful in order to systematically structure the main insights from the interviews.[3] Affordability was mentioned by most actors, emphasized strongest by business actors. Security of supply was highlighted most strongly by political and international actors. A substantial share of the national civil society and business representatives discussed the goal to promote the national energy industry, which was rarely mentioned by political representatives. Finally, climate and environmental goals (or their weakness) were most frequently put forward not only by domestic civil society but also by half of the political actors interviewed.

Affordability

Keeping electricity prices low for citizens and energy-intensive, especially state-owned, industries was often mentioned as the single most important objective in the sector and as a pivotal strategic interest of the CPV to preserve its power [b1, b2, b4, b6, si1, p5, p6]. According to the communist heritage, providing affordable basic utilities to the people is a major factor for the Party's legitimization of power [si1].

Electricity tariffs are regulated by the government at a rate below cost recovery (c.f. Gerner et al., 2018; Maweni & Bisbey, 2016) and differentiated

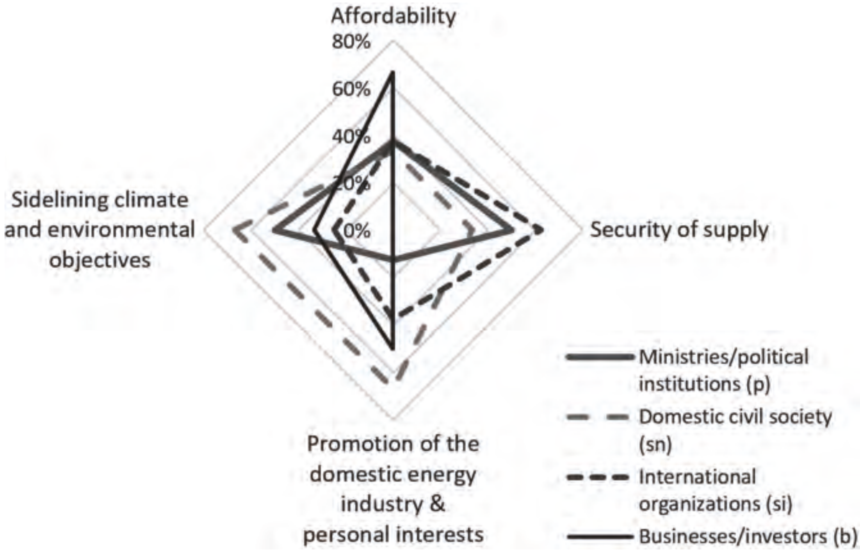

Figure 12.2 Strategic objectives affecting Vietnam's energy policy.

Note: shares of interviewees by category highlighting the respective objectives to be very influential for energy sector decisions in Vietnam.

by consumer type. Industry and residential users together account for around 90 percent of electricity consumption in Vietnam (EVN, 2018; IEA, 2017). Tariffs are lowest for the manufacturing industry, including the SOE-dominated energy-intensive steel, fertilizer and cement sectors, and public administration institutions, and highest for commercial businesses (EVN, 2019). Even though nominal tariffs were increased in 2017 [b2] and 2019, the raise was outpaced by inflation and rising generation costs (Gerner et al., 2018) [b1, b5]. Thus, in the period of 2012–2017, indirect subsidies effectively rose from about US¢ 1.3 to 2 per kWh (i.e. 25 percent of the average 2019 tariff of US¢ 8 per kWh (VND 1,860) (Vu, 2019)) [si5, b5]. In 2017, the total subsidy was roughly USD 3.5 billion (based on EVN, 2018). The government does not show any commitment to a clear tariff Reform Roadmap, beyond correcting for inflation, while indirect subsidies are likely to rise further as Vietnam's cheap hydropower sources have mostly been exploited [b1, p4]. The political goal of low electricity prices is influencing decisions concerning the electricity generation mix in several ways.

Lack of systematic cost analyses of capacity additions

Constrained price-setting results in a bias toward capacity additions with the lowest perceived cost. The Law on Bidding, issued by the Ministry of Finance

("Finance Ministry" ff.) mandates that the bid chosen has the lowest levelized electricity cost (LCOE). However, the Energy Ministry does not practice competitive tendering but chooses this lowest price from mostly unsolicited bids [sn1]. In 2014, when the current five-year power development plan, PDP VII Revised, was initially drafted, the LCOE of coal was indeed lower than that of alternative fuels [si1]. However, the reported LCOE might not even reflect the economic costs of coal-fired generation in a narrow sense (i.e. disregarding the adverse environmental and public health effects). Operation and maintenance costs, such as coal imports at increasing international prices as well as repair services, are often not considered. Furthermore, the Energy Ministry does not test the bids' compliance with minimum environmental standards [p8]. As a consequence, subcritical coal facilities, fueled with lower quality domestic coal, and often using cheaper, but less durable, Chinese equipment, may appear to decision-makers to be the most cost-effective capacity additions [si4, b4] (GreenID, 2018). This is one reason why coal-fired power plants are preferred over technologies that face higher upfront, but low operation costs, such as renewables.

Credit-constrained energy SOEs, subsidies and public debt

Because electricity tariffs are regulated below cost recovery, both the monopoly state-utility EVN and the state coal extraction and import firm Vietnam National Coal and Mineral Industries Group (Vinacomin) completely rely on government capital, which significantly contributes to Vietnam's increasing public debt [b1, b2]. The SOEs' financial risks mainly originate from operational inefficiencies, high levels of debt financing and related exchange rate risks (primarily to the Japanese Yen, the Chinese RMB and the USD) (Maweni & Bisbey, 2016). EVN's capital expenditure has typically been as much as 95 percent debt financed; however, its debt servicing requirements are not reflected in electricity tariffs (Gerner et al., 2018). As a result, state capital injections of approximately USD 3–4 billion were needed for EVN and USD 1.5 billion for Vinacomin (News VietNamNet, 2016).

The Party's efforts to keep tariffs low have furthermore resulted in a substantial increase in indirect subsidies for coal from USD 37 million in 2015 to USD 160 million in 2017 (excluding externalities) (IEA, 2018). The price of thermal coal paid by coal-consuming SOEs is subject to negotiations with the Energy Ministry and Vinacomin [b3]. As a result, domestic coal prices for thermal power, steel and cement production are artificially low [b1, p3], around 30 percent lower than import prices in 2015 (GreenID, 2018). One interviewee estimated subsidies to the power sector as a whole to amount to 5.5 percent of GDP, that is, roughly USD 10 billion in 2017 (excluding externalities) [b4]. The subsidized price gap is likely to grow due to increasing extraction costs of domestic reserves and fluctuating international prices of coal imports [b4, b3, p3]. These SOE liabilities translate into implicit fiscal costs and have decisively contributed to the government reaching its self-imposed debt ceiling of 65 percent of GDP in 2017 [b1].

Slow progress on electricity sector reform

In order to reduce the losses by state-owned power producers (and the associated budget deficit), there is increasing pressure to follow the Roadmap for Power Sector Reforms.[4] The Finance and the Planning Ministries strongly support the liberalization of the electricity market [si3, si4]. Despite reform plans, EVN's three generation companies, together with the SOEs Vinacomin and Vietnam Oil and Gas Group (PVN), control 90 percent of the generation (ADB, 2015). The first initial public offering of a generation company was largely unsuccessful, selling only a fraction of the offered shares due to the company's high indebtedness and the fact that EVN remains the majority shareholder with equitization capped at 49 percent [si3, sn3]. Due to the cap, generation companies have limited access to international capital markets even after the offering.

While the unsuccessful equitization process is also due to a lack of human capacity in the government [p7, si4], several interviewees emphasized that an underlying reason might be that some parts of the CPV actually oppose liberalizing the power sector to maintain EVN's monopoly status [b4, b1, si1, si5, b6]. Referring to the Reform Roadmap, a government-related interview partner said, "In the paper [sic], the government wants to open the energy market, but only in paper [sic]" [p8]. This opposition might be driven by vested interests in connection with the SOEs (see the "Promotion of the domestic energy industry and personal interests" section). Another reason is the regime's communist heritage whereby the Party takes responsibility for providing affordable electricity to the population and maintaining regulatory superiority over vital infrastructure [si1, si8]. Hence, the CPV's reluctance to increase electricity prices and its related concerns about public opposition impedes power market reform. Yet conversely, the population opposes price or tax increases mostly because they distrust the government and EVN due to the operational inefficiencies and the lack of transparency on how revenues are spent [si5, si6] (UNDP, 2019).

Tighter requirements for limited government guarantees

Budget consolidation efforts and increasing pressure to restructure the energy SOEs decisively affect investments in electricity generation [si6]. As loss-making entities, the SOEs depend on government guarantees to access foreign investment loans [sn1]. In mid-2018, the Law on Public Debt Management introduced a cap on the overall value of government-guaranteed foreign loans and increased the equity requirements [si3]. As a consequence, EVN is itself no longer able to invest in capacity additions [b4]. As part of the restructuring process, Vinacomin and PVN are encouraged to focus on their core business activities, which do not necessarily include power plants – of which they owned 14 percent of capacity in 2015 (Maweni & Bisbey, 2016). Consequently, the substantial increase in generation capacity envisaged in the PDP VII Revised relies largely on investments by (international) independent power producers.

Dependence on independent power producers and high investment risks

Due to the described financial and structural constraints, most generation capacity additions are expected to come from, primarily international, independent power producers (IPPs) [si4, p2, si5]. Independent producers can, however, face high investment risks [si3]. While IPPs control only 7 percent of the current fleet of power plants, the PDP VII Revised expects them to account for 60 percent of the roughly USD 90 billion total investment needs in capacity additions until 2030 (Gerner et al., 2018).

Investment risks in the electricity sector remain high and attractive only for certain investors [si8]: IPPs depend on EVN for power purchase agreements (PPAs), grid connection[5] and payments for electricity sold [sn3, si5, sn1]. Thermal power producers additionally depend on Vinacomin for coal supplies – which have recently fallen short of demand (VnExpress, 2018). EVN and Vinacomin remain highly indebted and have an interest in prioritizing their own generation facilities. The risk of nonpayment can only be mitigated by the government underwritings [si1]. Most importantly, PPAs remain weak and non-bankable, due to curtailment, termination and arbitration clauses [si3, sn3]. For example, while the relatively generous 20-year solar feed-in tariff (FiT) of approximately US¢ 9.35/kWh is considered sufficiently high to attract investors, the associated PPA includes neither protection against retroactive changes in policy nor hedging options for longer than one year. Additionally, its legal backing and arbitration clauses are weak [b1, b4, si3, sn3].

Existing guarantees for renewable investments are insufficient to enable most international banks or private lenders to provide project finance [b4, si3]. The unstable regulatory framework thus contributes to the investment gap to realize renewable energy projects as intended under PDP VII Revised [si8, b1, p8]. While Vietnamese banks have found the PPAs sufficient for financing, albeit, at interest rates of 8–9 percent with additional informal charges, local investors often lack adequate equity capacity [b1, b4, si2]. Joint ventures of international and domestic firms with financing from Vietnamese banks might provide a feasible option for renewable energy development [si3]. Indeed, as of June 2019, 4.5 GW of solar capacity had been completed (Viet Nam News, 2019), and as of November 2018, at least 12 GW of solar projects had received some type of official approval, mainly developed by domestic investors with some international participation.

Regulatory bias of investment risk reduction toward thermal power plants

Renewable projects thus face high investment risks, while certain larger thermal power projects are categorized as public-private-partnership projects with additional build-operate-transfer (BOT) [b1, si1]. Up until mid-2018, these 20- to 25-year BOT contracts were completely underwritten by government guarantees [si1]. Because large power projects are considered strategic infrastructure [si8, si1], the Prime Minister included many of them in the list of priority projects for which he raised the limit of foreign loan guarantees (Vietnam Investment Review, 2018). Thus, BOT contracts represent the only reliable proof of investment for independent producers [si2, si1]. The resulting investment climate seems to be suitable especially for government-backed investors and financers from China, Japan and South Korea [sn1, sn3].

Fiscal consolidation through environmental tax increases

In order to reduce the debt burden and environmental pollution, the Finance Ministry has, in the past, advocated to increase the existing environmental protection taxes on fossil fuels [b1, si4, p3]. Increasing the environmental tax levels for coal could potentially shift cost competitiveness toward less polluting energy sources. The environmental tax revenues accounted for more than 4 percent of the total budget revenues in 2016 (up from 2.7 percent in 2015), but only 2 percent of the revenues were from the coal tax (Government of Vietnam, 2017). Despite marginal increases, the tax levels of USD 1.3 (VND 30,000) per ton of anthracite and US¢ 60 (VND 15,000) per ton of lignite [p3] do not impact electricity sector decisions [si5].

Meaningful tax levels would clash with the Party's strife for low electricity tariffs. The government voiced concerns that tax increases might negatively affect industrial competitiveness and raise consumer prices and inflation [p3, p4, p2, p6, b2]. Referring to the carbon tax considered (World Bank, 2019a), an Environment Ministry representative told us that "Vietnam is not ready" and "due to the low income of the population, subsidies are necessary". An increase in the coal tax (or the removal of indirect subsidies) is thus unlikely in the near future [p5, si3, p2].

Security of supply

"Keeping the lights on" [si1] for citizens, and providing sufficient electricity to sustain high economic growth rates, was generally voiced as an important pillar of the CPV's energy policy, and as pivotal for the Party's strategy to legitimize and maintain its power [si1, si3, p5, p1]. The narrative that high levels of energy supply growth constitute a necessary prerequisite, if not a main driver, for economic growth (e.g. World Economic Forum, 2012) is widely adopted among government officials [p8]. The importance of this goal is most visible in the symptomatic overestimation of electricity demand growth, mostly due to overestimated economic growth expectations and conservative energy conservation assumptions. While the PDPVII Revised adjusted the total annual generation by 2030 downward by 18 percent, it is still likely to overestimate demand growth [sn1] (Neefjes & Thi Thu Hoai, 2017). Anecdotal evidence from the development process of the PDPVII indicates that political interventions, especially by the Prime Minister, are the main reason for continued overestimations [si8], allegedly, requesting to raise expected year-to-year demand growth from

12 to 20 percent due to higher expected GDP growth [p1]. The political goal to supply sufficient electricity is influencing developments in the generation mix in several ways.

Coal perceived as stable and well-known

Apart from hydropower, which has traditionally supplied the bulk of electricity, coal is the single most trusted source of electricity generation [p2, si1, si5], despite concerns related to increasing dependence on imports. At EVN, in the Energy Ministry, and even the Environment Ministry, "most experienced experts want coal" [p1], saying "the solution to [electricity supply] issues is clean coal" [p8]. They know the technology well and are comforted by its proven track record of ensuring stable electricity supply in Vietnam's (seasonally fluctuating) hydro-based system [sn1]. At the same time, the Party's Committee on Economics has acknowledged energy security in terms of dependence on coal imports as a strategic concern [sn1, p8]. This is especially relevant as the Energy Ministry, for the first time in six years, warned of power shortages as early as 2019. Vinacomin's inability to keep pace with the growing demand for coal supply has forced some facilities to run at lower load factors (VnExpress, 2018). Structural supply bottlenecks are expected after 2021/2022 due to delays in the construction of several strategic power plants, as well as insufficient transport capacity for coal imports [si8, si1, b4, si6]. This has to some degree contributed to renewable energy being viewed as relevant in order to diversify the generation mix and relieve the pressure on coal supply [p2].

Uncertainty about renewables' grid integration potential

The same circle of senior experts advocating for coal in the Energy Ministry and EVN is quite outspoken in their concerns regarding intermitted renewables. In their opinion, more than 10 percent renewable electricity generation, as planned in the PDP VII by 2030, could destabilize the transmission system and interrupt supply [p5, sn1]. This sentiment partly owes to the centralized five- to ten-year plans governing the electricity sector; forward planning of regionally balanced supply between North, South and Central Vietnam is easier if serviced by a few large power stations rather than multiple fluctuating small installations [p1]. Independent experts, however, expect that problems of system load, ancillary services and, in particular, a lack of human capacity for grid management would only arise at renewables shares well above 20 percent [si8, si7]. There is, however, a lack of information disclosure by EVN.[6] This means that independent analyses are hampered by information asymmetries and uncertainty about technical parameters and data [p1]. Even the CPV and its advisory committees, which constitute the highest decision-making bodies, are not well informed, as they also rely on judgment from experts within the Energy Ministry and EVN [b4, sn2].

Promotion of the domestic energy industry and personal interests

The strong incumbent resistance to transition is the implicitly underlying reason behind many of the above-described regulatory biases in favor of fossil energy carriers. Yet, this goal to promote the existing domestic energy enterprises is less explicitly articulated because it is often linked to incumbent vested interests and personal benefits [b4, b3, b1, si1, si5, si6, sn1].

"Revolving door" with EVN and weak regulation

The main cause for the weak regulation and protracted reform of EVN, Vinacomin and PVN is the "revolving door" [si1], that is, the frequent exchange of senior personnel, between the Energy Ministry, its SOEs and their subsidiaries along the electricity supply chain [si5, b3, b1] (c.f. also Heger, 2017). Thus, due to close personal ties, the regulating and regulated entities share strong, also personal, interests. Interviewees described this network as a "group of beneficiaries" [si5] or "invested group" [sn1], built around fossil fuels with an interest in maintaining the status quo [b1]. Within this group, EVN is the most powerful player and "barrier of the country" to energy sector reform [si5, b4]. Due to its strong influence on the Energy Ministry, representatives of the Ministry's renewables department and the – officially independent – Institute of Energy are reluctant to mandate policies that might contradict EVN's interests, even if they personally do not have direct ties to SOEs [si5].

Several interviewees highlighted that one of the major streams of (mostly personal) revenue originates from the lack of transparency along the coal supply chain [si1, b1, b3, b5]. For example, EVN or Vinacomin might import coal at more beneficial conditions, that is, lower prices or higher exchange rates or at lower quantities than actually reported [b1, b3]. In another example, Vinacomin's provincial mines do not have to report deals of up to USD 1 million to higher levels [b3]. The SOEs' deficits from such nontransparent practices are eventually covered by the government. Some of these funds are channeled to high-ranking officials in the Energy Ministry as well as to members of the Party's Central Committee. These "invested" actors hence have little incentive to enforce transparent information disclosure (required by the government-issued Decree 81/2015/ND-CP) or reform the electricity sector [p 8, si5, b1, sn1, si6].

The Planning and the Finance Ministries openly criticize the low quality of reporting by the SOEs to the government. They claim that, because information disclosure duties are not enforced, financial reporting is insufficient to assess the transparency of SOEs (U.S. Department of State, 2018). Yet, the Planning and the Finance Ministries are not in a position to promote meaningful change in the energy sector, which could only be initiated by the CPV [p 8, sn1, si5, si4]. Thus, the institutional and personal interests in maintaining the status quo not only conflict with the main goals of ensuring reliable and affordable electricity supply but these interests also directly promote fossil, mostly coal-based, generation additions.

Complex permitting process and favoritism

The complex, costly and time-consuming permitting and approval process for new generation facilities further hampers investments in Vietnam's generation capacity [si2, b1]. Apart from financing bottlenecks, bureaucratic delays throughout the permitting process are one of the reasons for the current delays in the construction of at least ten coal-fired power plants [b4, p8, si3]. Those delays cause additional stress on Vietnam's power supply starting in 2022 [b4]. Obtaining all necessary licenses normally takes between six and ten years. New power projects first need approval by the respective provincial administration. They are then incorporated in the Provincial Power Development Plan by the provincial Energy Ministries to receive a construction license and grid connection. Generation facilities larger than 50 MW require additional approval on the national level [p1, p8, si5].

Public procurement in Vietnam's natural resources sector, which all energy SOEs are directly or indirectly involved in, bears especially high risk of corruption, diversion of funds and favoritism and, respectively, a lack of accountability in the licensing regime [b4, si2] (Bertelsmann Stiftung, 2018). The Provincial Competitiveness Index consistently finds that in order to secure government contracts the majority of companies expect to provide "gifts" to officials and strong ties to provincial governments are necessary. Additionally, private sector firms face less favorable terms than SOEs regarding access to, for example, land and capital (VCCI, 2017).

Apart from the investment risks described, the corruption-prone process poses an additional hurdle for smaller, nonfossil IPPs but gives an advantage to, particularly state-affiliated, investors in thermal coal [sn1]. Local renewable energy investors with limited equity often struggle to afford additional (informal) upfront charges [sn3]. International firms interested in tapping Vietnam's renewable potential are often prohibited to pay such charges according to their corporate MOUs [b1]. However, Chinese state-owned and Korean and Japanese enterprises and banks successfully conduct business in Vietnam. Having established good ties with the Party representatives at local and national levels, they provide one of the few available sources of capital in the described context of favoritism and political uncertainty [si6, si2, sn1, b4] (c.f. Hannam et al., 2015). A 2014 National Assembly report found that over 90 percent of public procurement went to Chinese firms (U.S. Department of State, 2017) and nine out of ten renewable energy installations in Vietnam reportedly use Chinese equipment [si1]. Hence, for the period of the PDP VII Revised (2016–2020/2030), the majority of foreign direct investment in the electricity sector is targeted at thermal coal power plants. For example, the latest 25-year thermal BOT contract with EVN was signed by a consortium of the Japan Bank for International Cooperation (JBIC), the Oversea-Chinese Banking Corporation Limited and the Bank of China in April 2019 (JBIC, 2019). Negotiations for this USD 2 billion coal plant investment initially started in 2011.

Climate and environmental objectives

Vietnam's various policy plans and strategies related to climate change mitigation have neither affected greenhouse gas (GHG) emissions growth nor the pipeline of additional coal-fired capacity. Local environmental and health concerns, in contrast, have effectively deterred the construction of a few coal power plants in some provinces. Yet, environmental and climate considerations exert little influence on electricity sector planning.

Vague, inconsistent and weakly implemented emission reduction targets

Vietnam's several strategies relating to sustainable development have been largely detached from electricity sector planning, lack consistency and implementation, and are thus unlikely to curb the coal pipeline. There is a lack of integration between sectoral planning documents, which owes to an institutional separation between the line ministries, described as a silo mentality [si8, b3]. The Climate Change Strategy (CCS) (Government of Vietnam, 2011) and the Nationally Determined Contributions (NDC) (MONRE, 2015) are with the Environment Ministry, the Green Growth Strategy (GGS) (Government of Vietnam, 2012) with the Planning Ministry, and the Renewable Energy Development Strategy (REDS) (Government of Vietnam, 2015) is with the Energy Ministry. These strategies formulate targets differently with regard to GHG emission reductions or intensity improvements. Moreover, they refer to varying business-as-usual (BAU) assumptions that are subject to controversies between different government agencies [p2, si6].

For the electricity sector, the formulated supply-side goals are to diversify the generation mix to reduce import dependency rather than reduce emissions or the coal pipeline [p2, si8, si5]. The aim is to increase renewables and reduce coal exports and imports (c.f. REDS, GGS). Instead "the most important [mitigation] options are [seen] on the demand side" [p2]. These include energy efficiency measures and fuel switching in the industry and transport sectors, as well as land-use change [b2, p5, p6]. However, efforts on the electricity demand side, especially industrial energy efficiency improvements, are undermined by electricity sector policies. Most prominently, the regulated, extremely low electricity and coal prices provide few incentives for energy savings [p2, si8, si3, b4]. According to a financial sector expert, the indirect subsidies for fossil fuels of several billion USD annually are an important reason why energy and environment plans are not consistent.

Finally, weak implementation and enforcement render many strategies and plans rather ineffective [si4, p5] or, as one interviewee put it, there is "no correlation" between plans and reality [b1].[7] Even interviewees from government institutions stressed that the goals are largely statements of intent "only on paper" [p8, p5] and even environmental goals that have been translated into law are often not enforced due to a lack of political will [b1, si2, si5, p8].

Reciprocal interests with international donors

Many of Vietnam's environment-related strategies were initiated by international development agencies [b1], whose (conditional) financial assistance has historically accounted for a sizable share of the government budget. However, the interaction of government and donor interests has in the past contributed to contradictory outcomes for several reasons. The Vietnamese government, on the one hand, has shown great interest in attracting further development finance with favorable borrowing conditions, especially after the country's recent graduation from two low-interest funds[8] [p4, si2]. The donor organizations, on the other hand, are themselves interested in continuing to lend [si2] (e.g. Rahman & Giessen, 2017). For example, EVN received direct financial and advisory support to prepare for its credit rating (World Bank, 2018); it received an issuer default rating of "BB", equivalent to the government's rating. The rating is sufficient for EVN to access foreign loans, especially from international financial institutions, without additional guarantees [si3].

The reciprocal interests have created contradictory incentives on both sides. First, the government is incentivized to approve environment-related policy plans that specifically meet the donors' requirements in order to tap into the increased volumes of environmental development policy financing[9] [b1]. However, most of this results-based support has been tied to policy outputs, rather than outcomes, that is, to the approval, but not necessarily to the subsequent implementation of policy decisions [si2, si8, b4] (c.f. Independent Evaluation Group, 2016). Second, in order to single out their contribution and prove aid effectiveness, donors have been reluctant to coordinate their efforts [si8] (c.f. Fuchs et al., 2015). Such policy-oriented efforts have significantly contributed to the silo mentality between government agencies as they compete for financing, as well as to the incoherence between environmental and energy planning documents [b3, si1]. Third, the weakly conditional financial support hampers political reform as it relieves financial pressure from the government and SOEs [si2, b4]. For example, of EVN's USD 9 billion debt (2016), 90 percent are backed by the Finance Ministry, the majority of which are directly on-lent funds from international financial institutions (Gerner et al., 2018) As suggested in the literature, despite the well-known misappropriation and ineffectiveness of funds, many donors are continuing to (indirectly) fund the fossil-based system as it seems to serve their own interests, such as the continued outflow of funds (c.f. Rahman & Giessen, 2017; Swedlund, 2017).[10] These substantial financial flows are likely to strengthen the existing incumbent resistance to transition and thus render (environmental) development policy financing ineffective [si4].

Effective local public resistance against coal-fired power plants

While international efforts might not have deterred Vietnam's coal plans, the formation of local public resistance has effectively pushed some local

Provincial Party Committees to cancel already approved coal-fired power projects and oppose new ones. In some provinces, especially in Southern Vietnam, public opposition is increasing due to concerns of degrading local air quality, as well as environmental harm from wastewater and ash and slag discharge [sn2]. In particular, Vietnam-based nongovernmental organizations (NGOs) have successfully focused their climate change, mitigation-related advocacy work at the community and province levels [sn1, sn2]. While some provincial governments have subsequently advocated for renewables and gas-fired power additions with the national Party cadre, others, in regions depending on coal mining, exert equally strong influence on the national level in favor of coal [b3, si4]. Nationally, the Prime Minister prominently advocated for a moratorium on new coal-fired power plants in the Mekong Delta after 2020 [b1, si2, p5].

Conclusion

This analysis of Vietnam's energy and climate governance reveals that the motivation to expand coal-fired capacity goes far beyond (or even contradicts) economic cost criteria and it is rather determined by the state's control over the energy sector, incumbent networks, and international enabling environments. We find that Vietnam's focus on coal for electricity generation is primarily driven by the incumbent networks between decision-makers in the Communist Party, the Ministry of Industry and Trade ("Energy Ministry"), responsible for regulating the energy sector, and the state-owned energy enterprises (SOEs). Financial and structural constraints lead to a strong dependence on – mostly international – independent power producers for capacity additions. Yet, barriers for renewable energy investors remain high because market regulations are volatile and tailored to the needs of fossil-leaning energy SOEs. International and local environmental efforts exert limited influence on the energy sector. Concessional development policy financing creates incentives for weakly integrated and hardly enforced environmental strategies. Additionally, direct budget support to SOEs relieves to some extent the financial pressure to reform. Despite this combination of factors that consolidate Vietnam's reliance on coal, some recent developments could gradually change policymakers' incentives. First, declining prices for clean energy sources in conjunction with increased fiscal pressure and warnings of electricity shortages may accelerate renewables' build-up – around 6 GW of grid-connected solar had been built at the time of writing – as well as the liberalization of the power market. Second, a shift of financial support from international donors and investors away from coal could result in a further expansion of renewables. Third, public concern about climate change and environmental pollution could provide an important motivation for the Communist Party to reconsider its focus on coal-based power generation.

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Appendix

This chapter contains supplementary online material at https://www.mcc-berlin.net/pecoal/ch12.

Notes

1 This chapter draws on the article Dorband et al. (2020). We gratefully acknowledge permission to reproduce parts of the content from Elsevier.
2 We transcribe all but five of the interviews in which the interviewees refused or seemed reluctant to speak openly when recorded. We guarantee the anonymity of all interview partners.
3 Note that we count each interviewee mentioning a specific objective as one mentioned, irrespective of how many times during the interview the objective was mentioned.
4 The 2006 RoadMap for Power Sector Reforms envisages a fully competitive wholesale market by 2021 and retail market by 2023.
5 EVN has to provide the connection to the close-by substation, while developers themselves are responsible for the immediate electricity line to the substation. This can be costly for remote renewables and wind.
6 EVN does not disclose key data, for example, on actual demand, production costs or system data. For example, the Institute of Energy, which is mandated with electricity system modeling and drafting the PDPs, is required to schedule interviews with EVN representatives in order to receive such data, according to an interviewed expert from the Institute.
7 Examples of plans, the implementation of which is extremely delayed or continued to be postponed, are the GGS and the Roadmap to Liberalize the Electricity Market (si4).
8 From the World Bank's International Development Association and the Asian Development Bank's Asian Development Fund.
9 "Development Policy Financing […] is intended to achieve development results primarily through the supported policy reforms and associated policy dialog and support" (Independent Evaluation Group, 2016, p. 1).

10 Recent examples of assistance, the effectiveness of which were called into question by interviewees, included: (i) USD 340 million of direct budget support by the EU, (ii) substantial financial support to the Finance Ministry to guarantee further debt of EVN by the World Bank and (iii) a USD 100 million loan from the same organization, guaranteed by the Green Climate Fund with another USD 75 million (Green Climate Fund, 2019), for energy-efficient equipment in the SOE-dominated steel and cement industries. (si2, b4).

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Part IV

Coal exporters

13 Mining a fractured landscape

The political economy of coal in Australia

Peter Christoff

Introduction

Australia's coal reserves underpin the nation's electricity supply, and Australia is the world's largest exporter of metallurgical coal and second-largest exporter of thermal coal. Yet Australia's landscape for coal production is fractured. The national political terrain is split: fossil fuels are promoted by the Liberal National Coalition parties ('the Coalition' or LNP), opposed by the Greens, with Labor wavering in between. Australia's subnational States and Territories are divided between coal-producing and non-coal producing states, with contrasting energy policies, capacities, requirements, and ambitions. Responses to climate change are also refashioning demand and affecting supply. Australia's coal output is divided between local and export markets, with the first declining, the second still growing.

This chapter aims to examine the existential challenges confronting Australia's coal sector and to answer the question: what is the future of coal in Australia? To examine these fractures, this chapter first describes the salient characteristics of Australia's coal sector. Second, it outlines the historical and current drivers reshaping coal production and use, focusing on institutional features such as Australia's federated political system, ideologically driven political hostilities around climate and energy policy, and the impacts of corporatization, privatization, and technological innovation. The chapter concludes by considering trajectories and projections for Australia's coal sector.

Methodologically, it is influenced by the AOC (actors, objectives, context) analytical framework used by Jakob et al. (2020) covered in Chapter 1 and draws on insights from literature on historical institutionalism (e.g. Thelen and Mahoney 2010). Applying this framework includes identifying the societal and political actors and factors most relevant for the formulation of energy and climate policies; spelling out actors' underlying objectives; and assessing the economic, institutional, and environmental contexts which determine how certain objectives matter for certain societal actors. The framework is amended here to concentrate on interactions within and between four clusters of factors: actors, political institutions, economic and technological influences, and broader (ecological and economic) context. This occurs to better accommodate the

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perceived strong influence of institutional and economic/technological factors in this narrative.

The complex interrelationship between discursive contests and ideational shifts – the 'work' of actors in specific settings – and the influence of political-legal institutions, and of disruptive economic/technological and climatic shifts, in a federal system like Australia's – produces a kaleidoscopic tale with multiple storylines (Christoff 2013). It also creates a substantial methodological challenge: in this chapter, the record of actors' views and objectives has primarily been drawn from published statements, reports, and documents – tested, where necessary, through interviews.

Australia's coal sector

With 10% of the world's black coal reserves, Australia's coal resources rank fifth behind the United States, Russia, China, and India in size (GA 2021) and hugely exceed what can be burnt if global warming is to be held to the goals of the Paris Agreement.

In 2017, Australia produced 6% of global output of black coal, including 54% of global metallurgical coal exports (17% of total global production), and some 20% of global thermal coal exports (OCE 2019, 34, 43). Its coal production has risen significantly over the past four decades (Figure 13.1) (DISER 2020a) with roughly four times as much Australian coal now exported as is used domestically (Table 13.1).

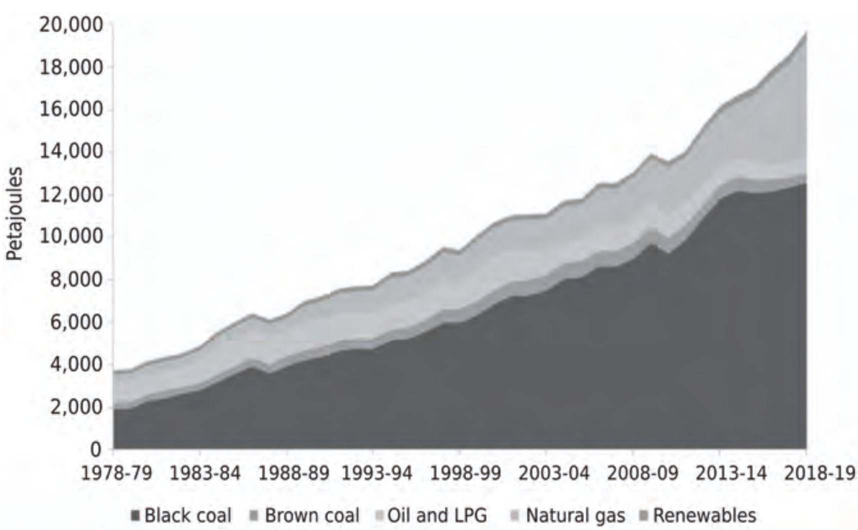

Figure 13.1 Australian energy production, by fuel type (1979–2019).
Source: DISER (2020a, Figure 3.2).

Table 13.1 Australian coal production (2018–2019)

	Domestic use	*Export*	*Percent of Australian coal production*	*Qld (Mt) (%)*	*NSW (Mt) (%)*	*SA (Mt)*	*Tas (Mt)*	*Vict (Mt)*	*WA (Mt)*
Black coal (thermal) (262.3 Mt)	52.5 20%	209.8 Mt 80%	58%						
Black coal (metallurgical) (191.2 Mt)	7.7 Mt 2%	183.5 Mt 98%	42%						
Total black coal (453.8 Mt)	60.2 Mt 13%	393.6 Mt 87%	90%	250.6 55%	196.6 43%	0	0.3		6.2
Brown coal (43.3 Mt)	43.3 Mt 100%	0%	10%	0	0	0		43.3	

Source: OCE (2019); DISER (2020b).

Coal production

Australia's coal sector is dominated by a small number of export-oriented multinational companies, the composition of which has changed significantly over the past decade. Pearse et al. (2013), writing about Big Coal in Australia in 2013, referred to the dominance of four major producers – BHP Billiton, Rio Tinto, Xstrata, and Anglo-American. By 2020, Rio Tinto had sold all its coal (and gas and oil) assets globally, citing them 'high risks' for a low-carbon future. The lead group now includes BHP Billiton, Glencore, Yancoal, Anglo-American, and Peabody Energy Australia (Table A.13.1). Anglo-American has indicated it intends to exit thermal coal by 2025. BHP is heading in that direction.

Queensland (Qld) (with 51 mines) and New South Wales (NSW) (42 mines) together account for 98% of black coal production and over 90% of coal mining employment (ABS 2019). Over the past decade, employment in coal mining has fluctuated between 40,000 and 60,000 jobs in total (full-time and part-time), having risen from around 18,000 jobs in 2000.

Some 36,000–58,000 people worked directly in the sector in May 2019 (ABS 2019), mainly concentrated in the Bowen Basin (Qld) and Hunter Valley (NSW) (Table A.13.2). This represents only 0.7% of total national full-time employment. However, coal mining provides a significant concentration of economic activity in a handful of regions which in several instances also have electoral power sufficient to influence policies that affect them. By contrast, in 2019 there were some 14,700 jobs, dispersed across Australia, in construction of renewable energy capacity (CEC 2020, 13–14).

Sizeable revenue streams from mining royalties underpin strong state support for coal in coal-producing states. Such revenue fluctuates also by changes in demand and in prices, and also by the impacts of natural events on output. In 2018–2019, Queensland's coal royalties totaled some $4.4 billion (Zhou 2020) and were the largest source of income growth and 7% of total income for that state (Qld Govt 2019, 77). In NSW, total mining royalties amounted to $2.1 billion that year – 2% of total revenue – and were forecast to deliver an annual average of $2 billion per annum for years to come (NSW Govt 2019, 4–4).

At the same time, coal mining companies are recipients of substantial subsidies – including through tax arrangements discounting investment costs, diesel fuel rebates, and 'deferred' subsidies associated with the substantial costs of mine rehabilitation, which will fall to the public given current arrangements.

Australia's domestic coal use

As noted earlier, approximately 20% of Australia's coal production is for domestic use. In 2020, 90% of 'domestic coal' was burned to produce electricity, the remainder was used for steel production.

In 2018–2019, thermal coal provided 58.5% of Australia's electricity supply (gas produced 20%, and oil 2%). Coal's contribution to electricity generation has fallen dramatically, from 83% some two decades earlier. Renewable energy

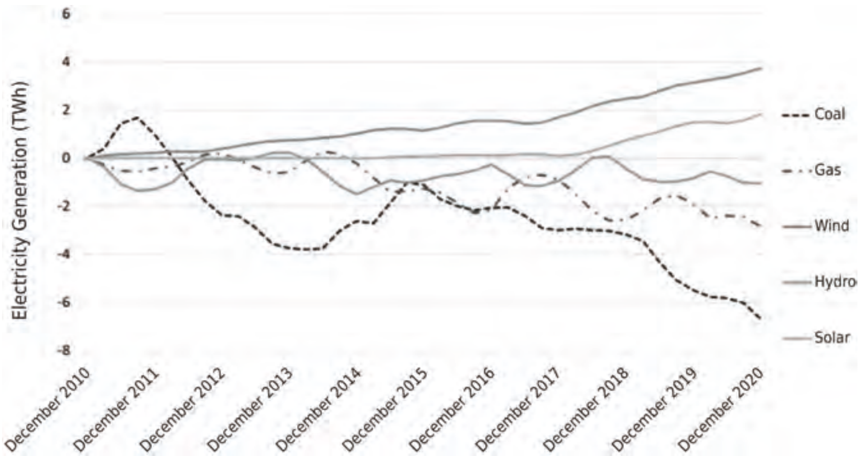

Figure 13.2 Australian energy sources for electricity (2010–2020).
Source: Australian Energy Market Operator (AEMO 2020b).

sources provided almost 20% – a rate doubled over the past decade (DISER 2020a). Renewable energy is displacing 'domestic coal' (Figure 13.2) and is expected to meet around half of Australia's electricity demand by 2025, with coal's share of power generation falling to 28% (Edis and Bowyer 2021).

The mix of fuels used for electricity varies greatly across Australia (Figure 13.3). In effect, the country splits into two blocs – the coal-producing, and non-coal producing states. Of the three coal-producing states – NSW, Queensland, and Victoria – the first two are both heavily dependent on coal for electricity and also major contributors to Australia's coal export economy. Victoria is not a 'coal exporter'.

The non-coal producing states – the Northern Territory, South Australia, Tasmania, and Western Australia – are neither dependent on coal for power generation nor coal exporters (Western Australia and the Northern Territory are heavily dependent on natural gas for domestic power and as an export).

Coal-fired electricity generation

In 2021, 22 coal-fired power stations operated in Australia. In that year, Australia's coal-fired power generation fleet had an average age that varied between States – from 38 years for NSW, 35 years for Victoria, and 25 years in Queensland (Table A.13.3). The age of these plants defines the path toward their closure: most of Australia's coal-fired power stations will come to the end of their working lives by 2035 unless regulatory obstacles are created to their closure or subsidies are provided to slow their retirement. Given the falling profitability of coal- and gas-fired power generation in Australia and the surging support for renewable

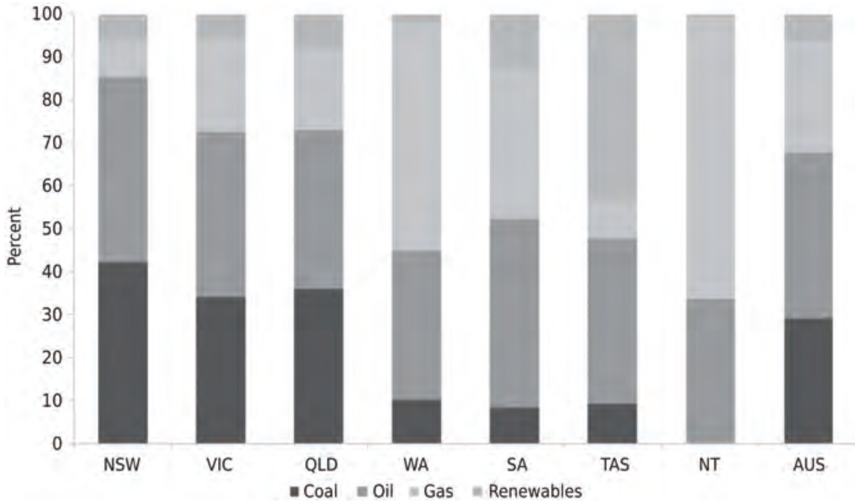

Figure 13.3 Australia: electricity generation, fuel mix by subnational states (calendar year 2019).

Source: DISER (2020a, Figure 2.9).

energy, substantial new investment to maintain or upgrade fossil fuel-based power generation is unlikely.

Twelve coal-fired stations have closed since 2010, and no new ones have been commissioned. Five additional closures have been flagged between 2021 and 2035, involving almost half the remaining coal-fired generation capacity in the National Energy Market (NEM) that supplies the populous east coast.

Australia's coal exports

Australia is the world's largest exporter of metallurgical coal by volume and value (Ball et al. 2020, Figures 5.6 and 5.8), with exports of 184 Mt, worth AUD $43 billion (fob) in 2018–2019 (OCE 2019, Table 2.2). Almost all of Australia's metallurgical coal, used for steel making, is produced from mines clustered in Queensland and NSW.

It is also the world's second-largest exporter of thermal coal (20% of total in 2020), after Indonesia (41%) and followed by Russia (17%) (Ball et al. 2020, 53). Exports of thermal coal totaled 210 Mt in 2018–2019 and were worth $26 billion (fob) (OCE 2019, Table 2.2).

Australia exports most of the fossil fuels it produces – including some 87% of its thermal and metallurgical black coal and 74% of its liquid natural gas (LNG) output in 2018–2019 (DISER 2020a, 33). Australia's coal exports have expanded substantially in recent years (Figure 13.4). Between 2000 and 2019,

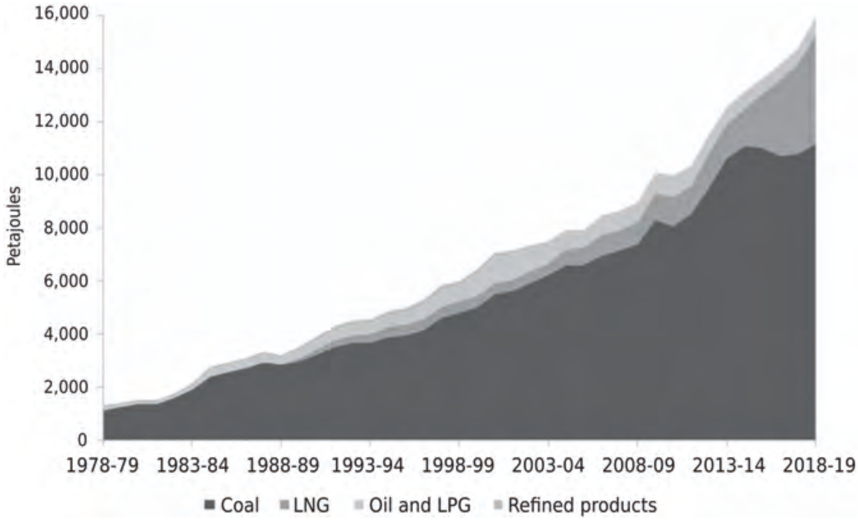

Figure 13.4 Australian energy exports, by fuel type (1978–2019).
Source: (DISER 2020a, Figure 4.2).

Table 13.2 Coal exports by major destination, coal type, and volume: 2018–2019

Export destination	*Thermal (Mt)*	*Metallurgical (Mt)*	*Total (Mt)*	*Percentage of total coal export (394 Mt) (%)*
China	47	41	88	22
India	4	47	51	13
Japan	79	35	114	29
South Korea	32	18	50	13
Taiwan	24	11	35	9
Total			**338**	**86**

Source: OCE (2019, Table 38).

thermal coal exports increased by 140% by volume, while exports of metallurgical coal increased by 66% (OCE 2019, Table 1).

However, the real boom for Australian coal began a decade ago, with the rapid growth in demand from China. On average, coal exports have grown by 3% a year over the past decade (DISER 2020a, 33). As Pearse et al. (2013, 30) noted, the consequences for regional Australia were dramatic, with rapid and massive investment in mine, port, and rail expansions – some $55 billion in 2010–2011 alone – to facilitate export of coal and gas.

Australia's coal exports mainly go to Japan, China, India, South Korea, and Taiwan (Table 13.2). India is expected to overtake China as Australia's major market for both thermal and coking coal by 2025, and South East Asia is also expected to become a major market. While coal imports by China, South Korea, Taiwan, and the EU27 are expected to decline over the next decade, the volume of Australian export-oriented coal production is still projected to increase slightly by 2025–2026 (DISER 2021).

In the year before the COVID pandemic depressed global economic activity, fossil fuels comprised Australia's largest bloc of exports by value. Worth some $120 billion in combination, those exports generated over a quarter of Australian export earnings by value in 2018–2019. Coal exports alone were worth AUD $69.6 billion (15% of total exports by value, but only 0.35% of GDP, in 2018–2019). The size of these earnings and their apparent importance to the Australian economy are facts used by the coal mining industry to bolster their rhetorical case for protecting the sector.

Australia's coal and greenhouse gas emissions

In 2019, Australia produced 1.1% of total global emissions (OMS 2021), making it the world's 14th largest national emitter of greenhouse gases (CO_2-e). Australia's electricity sector contributed one-third of those emissions, and coal-fired power stations produced 90% of this sectoral contribution (CCA 2016, updated for this chapter). Coal mining is separately responsible for 6 Mt of fugitive emissions leaking from open cut and underground mines.

Given the transition to renewables, emissions from electricity production are expected to diminish by a third over the next decade (Figure A13.1). However, government sources nevertheless estimate that Australia's domestic emissions reduction efforts will be insufficient to meet its 2030 Paris Agreement obligations (DISER 2020b) (Figure A13.2).

In 2019, Australia's thermal coal exports embodied around 500 Mt of emissions (CO_2-e), while its metallurgical coal exports embodied a further 450 Mt CO_2-e. Coal exports alone contained double Australia's domestic contribution to global warming in that year (DEE 2019, Figure 13).

When domestic emissions and emissions related to exported fossil fuels (including LNG, embodying some 165 Mt CO_2-e) are combined, Australia is responsible for approximately 5% of total global emissions, making it the world's 5th largest producer of greenhouse gases (CO_2-e).

The political economy of coal

Domestic coal

Several clusters of factors are driving Australia's transition away from domestic coal use. These include subnational policy dynamism which is compensating for the decades' long failure of national climate policy, privatization and grid expansion, threats to the security of electricity supply, and changing technological capacities and market conditions in the electricity sector.

The relationship between these factors is complex but, by way of brief summary of the following argument, it involves a sequence of developments.

Political conflict over climate change at the national level and consequent failure to establish and enduring and coherent national path toward decarbonization forced Australia's subnational states, in response, to take up the burden of mitigation in an uncoordinated manner. Meanwhile, the corporatization, part-privatization, and national integration of the electricity generation sector, coupled with the rise of highly price-competitive renewable technologies, have eroded the capacity of coal-fired electricity utilities to maintain their quasi-monopoly over the sector. Alongside the fact of an aging fleet of coal-fired plants, these factors in combination have ruptured Australia's long reliance on domestic coal.

National climate and energy politics

Five groups of actors have been evident in contests over Australian climate and energy policies. These include political actors (politicians and political parties), knowledge brokers (including climate scientists, economists, and other academics), national environmental NGOs, the mass media, and energy industry representatives and lobbyists (Table A.13.4).

In 1996, the Coalition won national government, led by a professed climate skeptic, John Howard. Until the Howard Coalition government was defeated in 2007, national climate and energy policies were guided and sometimes scripted by the fossil fuel industry, whose access to and influence over relevant policy arenas was so powerful as to suggest 'state capture'. This access is best exemplified by the success of the industry lobby group, the Australian Industry Greenhouse Network (AIGN), which nicknamed itself the 'Greenhouse Mafia' (Pearse 2007, 228ff). Influential supporters of the fossil fuel sector moved between political, bureaucratic, and industry positions, blurring accountability and responsibility, and consolidating a homogeneity of views about the vital importance of coal for Australia's economic health.

Their aligned perspectives were reinforced publicly by the Murdoch media, and internally by advice from key agencies and departments such as Foreign Affairs and Trade, Resources and Energy, Treasury, and Prime Minister and Cabinet, and the Australian Bureau of Agriculture and Resource Economics – as evidenced by critical policy statements such as the 2004 White *Paper, Securing Australia's Energy Future* (ETF 2004). Meanwhile, Prime Minister Howard also ensured his government's enduring opposition to the Kyoto Protocol and resistance to mitigation measures such as carbon pricing.

These factors – along with the absence of an effective industry voice promoting renewable energy interests, and the national environmental non-governmental organizations (ENGO)s' weakness on energy-related issues – ensured that a hegemonic discourse supporting coal prevailed in the national political sphere until around 2007.

The Howard Government enacted only two climate laws of consequence during its 11 years in office: the *Renewable Energy* (Electricity) Act 2000 and the *National Greenhouse and Energy Reporting Act* 2007. Under the Renewable Energy Act, a modest national renewable [electricity] energy target (RET) was set, expanded in 2009, but then reduced – to 33000 GWh per annum (around

23.5% of total generation) – in 2020. This target has been surpassed but no amendment to it is anticipated before 2030 (CER 2018).

By 2007 and the election of the Rudd Labor government, the hegemonic discourse about fossil fuels was fraying, replaced by bitter national political contestation over ratification of the Kyoto Protocol, emissions reduction and renewable energy targets, carbon pricing and emissions trading, and associated legislated measures. Called the 'Climate Wars' by some (Butler 2017), this ideologically driven conflict cost five Prime Ministers their jobs and caused national climate policy to advance slowly and retreat chaotically for the next ten years, 'the lost decade' (Chubb 2014; Crowley 2013, 2017; Warren et al. 2016; Wilkinson 2020).

Only for less than three years, between 2011 and 2014, did Australia have a national carbon price, national advisory committees on emissions targets, and two public funds to boost investment in renewable energy. The Abbott Coalition government repealed the Gillard government's carbon price mechanism in 2014 (the other measures survived in much-diminished form).

The Climate Wars were largely won by the fossil fuel sector's supporters. They left domestic resource and energy policy settings largely undisturbed. As a consequence, corporate willingness to invest in renewable technologies cooled for that decade while also eroding corporate confidence in the future of coal-fired power. Paradoxically, the Gillard carbon price nevertheless provoked large corporate energy users to undertake cost-saving efficiency measures regardless of immediate policy settings.

During the second decade of the 2000s, fossil fuels' challengers became more effective. Corporate support for coal began to fracture. Multinational resource companies with diverse portfolios and only a partial reliance on energy, and non-Australian energy companies domiciled in countries with more progressive climate/energy policies, began to publicly acknowledge the science on climate change and split ranks from 'pure coal' players. BHP-Billiton and Rio Tinto assessed the longer term consequences of climate change for their assets and began to exit thermal coal. Meanwhile, former corporate allies in the finance sector – major banks, superannuation funds, and insurers – began to distance themselves from the coal sector as they took stock of the prospective economic impacts of climate change for their businesses and portfolios and began to formally account for such liabilities.

Critically, Australia's nascent renewable power sector began to coalesce into a lobbying bloc of its own, establishing effective representation through the Clean Energy Council, formed in 2007, and supported by independent media such as *ReNewEconomy*, since 2012. The influence of the Murdoch media perhaps declined with respect to views about climate change. The environmental lobby also began to change: older environment groups were displaced by new climate groups with a younger membership and more media-versatile campaigning and outreach – such as GetUp, the Australian Youth Climate Coalition, and most recently, the School Climate Strike movement. Activists frustrated with all political parties stood for Parliament as Independents – most notably, Zali Stegall, who defeated former Prime

Minister Tony Abbott, capturing the seat of Warringah in the 2019 national election.

Even so, national-level lobbying by allies of the carbon sector continued unabated. In 2019, the Business Council of Australia (BCA) *Plan for a Stronger Australia* still demanded 'existing energy sources be improved and upgraded', with its head, Jennifer Westacott stating,

> we'll make sure that the existing coal-fired power stations, which represent 60 per cent of all energy use, stay open. And that there are incentives for people to invest in those, and that we've got supply of coal coming into those power stations.
>
> (Gocher 2019)

Given these realignments, in 2021 the Coalition is less likely to proper aggressive support for domestic coal but maintains its enduring allegiance to fossil fuels in all other respects. The Morrison Coalition government's plan for emissions reduction – the Technology Investment Roadmap – outlines ongoing government support for mature 'existing, proven technologies' such as coal and gas 'where there is a clear market failure, like a shortage of dispatchable generation', alongside clean renewable energy sources and, potentially, nuclear power (DISER 2020c, 15).

The National COVID-19 Coordination Commission supports gas to drive the economic recovery, and fossil fuel industries and associated groups have applauded the Morrison government's endorsement of recommendations from an independent panel on low-cost abatement – chaired by Grant King (former President of the Business Council of Australia and former long-serving Managing Director of the major gas company Origin) and including Ms Susie Smith (CEO of the Australian Industry Greenhouse Network) – for carbon capture and storage measures, strongly funded by national government, which they hope will extend the life of their industries.

Subnational policy dynamism

The institutional complexity of Australia's federal political system provides multiple forums and opportunities to circumvent these policy failures in the national sphere, especially as State and Territory governments have constitutional responsibility for governance of energy resources and key services such as the provision of water and electricity.

While Coalition governments have predominated nationally for the past three decades, Labor governments have held power in most States and Territories for much of that time. These subnational governments have driven the decarbonization of Australia's electricity sector, with consequent impacts for coal production and use. Initially, only the governments of non-Coal States (South Australia, Tasmania, and the Australian Capital Territory [ACT]) were involved, with the notable early exception of Victoria. But NSW and Queensland have now also joined this trend.

In 2006, SA and Victoria established the Council for the Australian Federation (CAF), a forum for all subnational political leaders to discuss common concerns in the absence of national-level leadership. It was the CAF that called for a national emissions trading scheme (ETS), in 2007 (CAF 2007, principle 5) and then commissioned the Garnaut Review (Garnaut 2008), which shaped national Labor's subsequent ETS initiatives.

The South Australian Rann Labor government was the first government in Australia, in 2007, to introduce framework climate legislation and also the first government in the world to enshrine a 2050 target in legislation. Following Germany's example, it was also the first government in Australia to introduce solar feed-in tariffs (in 2008), and streamlined land-use planning regulations to attract windfarms.

By 2010, every subnational government barring the North Territory had implemented generous feed-in tariffs. These tariffs meant that by 2020, over 2.5 million Australian households, and then businesses, invested in rooftop solar (CEC n.d.) and in 2020, the IEA reported that Australia is the world leader for installed solar photovoltaic (PV) per capita (IEA 2020, 11).

Most States and Territories now have renewable energy targets exceeding the national RET, and most have already outperformed against their targets. Moreover, by 2020, every Australian State had committed to a 'net-zero emissions by 2050' goal. By the close of 2021, five - NSW, Queensland, South Australia, Victoria and the ACT - have mitigation strategies with emissions targets exceeding Australia's nominated national 2030 goal of -26% to -28% below 2005 emissions levels. Tasmania has already reached net-zero emissions.

Five factors have made this powerful subnational counter to national policy trajectories possible. First, subnational Labor governments have long evinced greater concern for environmental and social outcomes. This normative orientation encouraged their greater attentiveness and responsiveness to public opinion about global warming.

Second, subnational governments generally have more direct legislative and regulatory responsibility for and involvement in resource development and environmental issues than the Commonwealth government, especially since the mid-1990s and the rise of 'cooperative federalism'. As Christoff and Eckersley (2021) indicate, the development of state climate policy action began with States and Territories – South Australia, Tasmania, and the ACT – that had relatively small economies, low reliance on fossil fuel-generated electricity and no coal exports, and therefore faced low political risks in this policy space.

Victoria, by contrast, faced greater hurdles, being a major fossil-fuel power-dependent manufacturing economy – but not a coal exporter. Here, the antiquity and emissions intensity of its brown coal-fired power stations made them economically unviable and ecologically indefensible. The oldest, known as Hazelwood, was 53 years old and one of the highest emitting power stations in the developed world, producing 14% of Victoria's and 3% of Australia's emissions, when it was abandoned by its owner the French company Engie and closed in 2017.

Third, altruism and policy activism by individual political actors such as South Australian Premier Mike Rann, collective political reactions to the absence of national climate leadership, economic self-interest, and rivalry over climate targets between subnational Labor governments, have combined to produce virtuous competition over emissions reduction targets and measures at the subnational level. This has resulted in legislative and policy innovation, followed by political learning and policy transfer which strengthened support for and investment in dispersed solar, concentrated wind and solar, and energy storage (Christoff and Eckersley 2021).

Fourth, the Greens' gradual erosion of Labor's urban electoral base, winning Lower as well as Upper House seats (leading to two Labor-Green governments, in Tasmania and the ACT, since the early 1990s) has been perceived to be a greater threat subnationally rather than nationally by Labor. At the same time, environmental organizations have been more effective at lobbying on climate/energy issues at the subnational level, where the sharp focus on specific mines and specific coal-fired power stations has enabled more effective community-based campaigning. In combination, Greens' parliamentary pressure and ENGO lobbying have generated greater political attention to climate-related issues and policies at the subnational than at the national level.

Last, lobbying by the fossil-fuel power sector at the subnational level appears to have been under-resourced, fragmented between a plethora of companies and relatively ineffectual in protecting their interests, compared to concentrated lobbying efforts at the national level.

As a consequence, subnational policy innovations and public funding have provided a launching pad for renewable power, subsidizing and supporting the establishment of an accelerating transition away from coal which is now largely autonomous of government support.

Privatization

The trajectory for domestic coal was also reframed by the various unintended outcomes of corporatization and privatization of this sector. Throughout most of the 20th century, the state in Australia dominated investment in, and ownership and control of power generation and distribution networks. Then in the early 1990s, a period of vigorous reform of the state-owned energy sector, allied to national 'competitiveness reforms' (Warren et al. 2016), saw much of this capacity corporatized, with components of generation, distribution, and transmission disaggregated.

Some States partially or wholly privatized these components, selling to local and/or overseas commercial interests. In general, this represented a shift from a supply-side to a demand-side orientation in energy policy, breaking with the 'logic' and often unaccountable behavior of state-owned energy agencies investing heavily in generating capacity in the hope and expectation that increased supply would lower electricity prices and therefore stimulate demand by attracting industry investment.

Privatization was bitterly contested politically. Some States – such as Victoria – wholly privatized their power sector; others did not. As a consequence, the power sector now reflects a mixture of public and private ownership that varies across States. While, as this chapter will suggest, state encouragement of renewable energy production has increased over the last decade, privatization has inevitably diminished regulatory control over the infrastructural investment decisions of private and often international corporations operating in the electricity sector. This has made the sector vulnerable to rapid shifts in capacity (as per the retirement of Hazelwood in Victoria) and security of supply.

In all, the consequence of privatization, and subsequent investment and ownership by multinational power companies, has made the Australian power generation system more vulnerable to the vagaries and the tipping points of market forces and therefore more difficult to govern. But it has also accelerated the transition away from coal.

Grid expansion and regulation

The States once maintained discrete power grids. Grids in eastern Australia were joined up in 1998 to create the NEM. This produced the largest wholesale electricity market in the country, covering Australia's eastern and southern-eastern coasts and supplying some 10 million customers (see DISER [n.d.] and AEMO [2020a]). A smaller, geographically isolated grid – the SWIS (South West Interconnected System) – services southwest Western Australia.

The creation of the NEM was intended to increase market efficiency and enhance security of supply, thereby lowering electricity prices, but it also created new problems. For instance, the retirement of major generating plants and the addition of renewable energy capacity now have an impact on supply, reliability, and electricity prices beyond the borders of individual States. As a result, three national bodies were established to regulate and govern the NEM: the Australian Energy Market Commission (AEMC), the Australian Energy Market Operator (AEMO), and the Australian Energy Regulator (AER).

The rise in national planning institutions has not, however, yet led to an effective integration of State-based or corporate activities, or to coordinated governance over investment in existing coal-fired capacity, new renewable generating capacity, and storage. The most recent attempt to do this is the AEMO's updated Integrated System Plan, which is seen as a 'dynamic roadmap for Australia's complex energy Transition' (AEMO 2020b). However, this overarching attempt has failed to supplant the more localized dynamics in Australia's energy system noted in this chapter and elsewhere (e.g. Parer 2002).

Market forces and new technology

The core logic of capitalism, searching for profit and allergic to loss, is now driving the domestic energy transition. The LCOE (levelized cost of electricity) has shifted in favor of renewables over the past decade. Investment in solar and wind power has grown very rapidly – solar by 50% in 2018–2019 alone – with much of this growth coming from rooftop solar and the establishment of large-scale PV power plants (DISER 2020c, 29–30; CEC 2021). At the same time, reliance on coal for electricity generation has fallen (Figure 13.2). Given current rates of private investment in electricity generation, various States are now seen to face problems such as projected shortfalls in security of power supply (AEMO 2020c).

The rapid uptake and the falling costs of renewable power have led to a crisis of value and profitability among coal-fired power producers. The value of coal-fired power stations, including new ones, has fallen quickly over the past decade with some now being written down off by their parent companies as low or worthless. These factors drove decisions by the French company Engie to shut Hazelwood in 2017, and AGL and EnergyAustralia, to announce closures of, respectively, Liddell in 2023 in NSW and Yallourn W in 2028 in Victoria.

In Western Australia, the Japanese energy conglomerates Sumitomo and Kansai, joint owners of Australia's newest power station (Bluewaters 1 and 2, built in 2010 and barely ten years old), wrote down the value of this asset to zero in December 2020 in the face of competition from renewable energy, mainly solar (Mercer 2020). Queensland's three generator companies in 2021 wrote down the value of their power stations by over $1 billion (QAO 2021, 7–8) while two major Australian energy companies, Origin Energy and AGL, have downgraded returns, earnings before interest, taxes, depreciation and amortization (EBITDA) by 8.6%, and written down assets by over $2.7 billion, because of falling wholesale energy prices. Edis and Bowyer (2021) conclude that the emerging energy mix will lead to a reduction of coal plant revenue by 44–67% by 2025.

Security of electricity supply

The last source of pressure on coal comes from the need to secure electricity supply. Australia's electricity market faces three forms of insecurity – the uncoordinated exit of operators, the uncoordinated introduction of intermittent renewables, and plant breakdown.

Policy interventions and state funding, alongside technological innovation – specifically the development of large-scale energy storage technologies, such as lithium mega-batteries and pumped hydro – are consolidating the prospect for energy security using renewable technologies. This will enable a faster transition away from fossil fuels. State-sponsored and part-financed development of 'Renewable Energy Zones' not only includes a focus on gridded renewables, but also on battery and pumped hydro storage to bridge low renewable generation periods.

Several examples underscore this trend. Following a grid failure in South Australia caused by climate change-impelled extreme weather, Elon Musk offered to build the world's then-largest battery to enable storage to bridge power shortages or surges in demand. In 2017, Tesla and Neoen then partnered to build what was then Australia's first and the world's biggest mega-battery (150 MW) – a global show project following a power outage in South Australia earlier that year.

This successful initiative has been followed by a flood of investment in battery storage that will prove the most economic means to undergird renewable power and deal with reliability during summer periods of peak demand in the NEM. This flood is marked by competition to install the 'world's largest battery' (see Hutchens and Terzon 2021; Toscano et al. 2021). Origin's proposed 700 MW battery and Neoen's 500 MW battery, both in NSW, will be the two largest storage devices in the world and will be worth a combined $1 billion.

Also in March 2017, Coalition Prime Minister Turnbull unveiled a plan to publicly fund a major expansion of the Snowy Mountain Scheme, Australia's largest and iconic hydro-generation complex, by adding Snowy 2.0, a major pumped hydro-project (DISER 2020d).

Graham et al. (2020, viii) suggest that when these technologies are added to renewable generation, wind and solar PV 'are the least cost generation technologies for the [Australian] electricity system for any expected level of deployment'. Even in the absence of subsidies and assistance, assessments of the capital costs of generation technologies indicate that coal has been priced out of the market since 2018, compared with gas, solar thermal, rooftop solar, large-scale PV, and wind (Graham et al. 2018, Figure 2–1).

These measures have substantial benefits for utilities, for grid operators and for guaranteeing the security of power supply. They further increase the opportunities for a fast exit from coal.

Export coal

By contrast, the larger, more lucrative export coal sector seems immune to domestic pressures for decarbonization. The cast of national actors supporting coal export is smaller in number, economically more substantial, more unified, and more politically effective than its counterparts in the domestic coal sector.

As a consequence, Australia's export coal sector is driven by international economic and political influences. These include international demand and associated market conditions, as determined by the energy and climate politics and policies of importing countries, and the risk appetite of funders and owners of existing and new mines, as determined by investing institutions.

Overwhelming political support

The coal export industry lobby's narrative has reinforced an enduring politically bipartisan ambition – strongly expressed since the 1990s by both Labor and the Coalition in successive Energy White Papers – to exploit Australia's comparative advantage in fossil fuel resources, and to use trade as a means to integrate Australia into the Asia-Pacific region, in particular with Japan and South Korea and more recently with China, for economic and security.

None of the major political parties – Liberal, National or Labor – has openly challenged fossil fuel exports. The giant Carmichael (Adani) Mine has become the bellwether of political support for export coal.

Labor, caught between wishing to appeal to rural resource-based electorates and to fend off pressure from inner urban Greens, is struggling to determine its position on Adani and export coal mining expansion in the Galilee Basin. Labor believes its failure to support Adani contributed to losing critical Queensland 'mining seats' and to its defeat in the last national election (a position disputed by Tranter and Foxwell-Newton [2020]). Possibly disciplined by this interpretation, and by pressure from retiring Labor backbencher Joel Fitzgibbon, its resource spokeswoman Madeleine King in April 2021 announced that Labor will not stand in the way of new mines and that she believes Australia will export coal beyond 2050 (Brown 2021).

This same 'anxiety' and policy paralysis is also evident in the policy stances of subnational governments in the two major export coal states, NSW and Queensland. Both continue to support growth in export mining while promoting domestic decarbonization. For instance, the NSW Liberal government has committed to enabling the opening of ten new coal mines in the Hunter Valley, despite its simultaneous commitment to local and global emissions targets of net zero by 2050 and evidence of majority community support for a moratorium on new mines.

Until around 2015, opposing Australia's existing fossil fuel export industries was also deemed too difficult by Australia's national environment organizations, such as the Australian Conservation Foundation, given the coal sector's perceived contributions to the national economy. Now, the proposed Adani mine provides a galvanizing and unifying focus for actors opposing export coal, including ENGOs, farmer organizations, and the Greens. This opposition has been amplified by concerns about 'unburnable carbon' (CTI 2011; CC 2015).

Geopolitical tensions

Australian trade in thermal and metallurgical coal is facing potential economic and political pressures from two sources. The first arises from growing geopolitical tensions afflicting Australia's relationship with its main market – China.

China is the world's largest importer of metallurgical coal and also Australia's largest market for thermal coal. Australia, a major regional ally of the United States, is susceptible to 'trade wars by proxy'. The Morrison government's intransigence on a range of political differences with the Chinese government has also chilled this trade relationship. These factors have led to informal import restrictions (bans and port slowdowns) on a wide range of Australian exports, including thermal and metallurgical coal, and the suggestion that China may seek alternative suppliers (Canada and Russia, for instance).

This situation may be transient, but if it endures for a decade, it may have a profound impact on Australian energy exports given the larger context of global moves toward renewable energy sources. Reduced demand may depress the price of Australia coal, which would either increase its competitiveness in other markets, or reduce profitability to the point where existing production declines as companies withdraw or collapse (the exchange value of the Australian dollar is also a factor here).

Climate change and decarbonization by trading partners

The second pressure is more generalized and enduring. Major importers of Australian thermal and metallurgical coal – China, India, Japan, South Korea – are seeking to increase energy efficiency, reduce greenhouse emissions, modernize their steel production processes or lower steel output (as per Japan [Ball et al. 2021, 45]), and enhance their energy security.

Australia's short-term trade in thermal coal has fallen, led by declining import demand from China, India, and the European Union (EU). Much depends, in particular, on whether or not China and India continue construct coal-fired power stations, and how they intend to fuel them. Developments in China's domestic coal market, growth in renewable energy provision and use, and its climate policies, pose 'risks' to Australia's coal export future. China has vowed to peak its use of coal by 2025, and to achieve net-zero emissions by 2060, which will require it to unwind its dependence on domestic and imported coal.

India has announced it will stop importing thermal coal by the 2023–2024 fiscal year. Meanwhile, the EU is moving steadily toward decarbonization of its power sector. As the global transition to cheapening renewable energy accelerates, Australia's trade in thermal coal can be expected to decline with increasing speed, probably over the next 10–20 years.

By contrast, Australia's metallurgical coal exports may prove slightly more durable. India is just beginning to produce steel, has limited domestic metallurgical coal resources, and is beginning to import coking coal. Australia is its main source. When and how India will develop its steel industry, and how it will seek to leap over the carbon dependency trap technologically, remain to be seen. These factors have variable implications for Australian coking coal trade.

Outlook

Domestic coal

A range of possible futures has been envisioned for Australian domestic coal. For instance, Jotzo et al. (2018) consider two scenarios for domestic coal-fired power. Their 'moderate' scenario has coal power plant capacity and coal use declining rapidly through the 2020s and 2030s. Coal use would be less than half the present level by 2030 and declines by over 90% by 2040. This scenario is based on average plan lifetimes gradually declining as renewables become still cheaper than they already are and comprising a quickly rising share of power generation. Their second 'faster' scenario has plant lifetimes diminishing more quickly, with coal use 'reduced by around 30 percent compared to today by

2025, reduced by two thirds by 2030, and falling to very low levels during the 2030s' (Jotzo et al. 2018).

By contrast, the AEMO's more recent *Integrated System Plan* contains five scenarios[1] developed through consultation with those closely involved in the power generation sector. Its 'fast change' and 'step change' scenarios project a reduction in coal-fired capacity by between 60 and 80% by 2040, with renewables and storage having substantially supplanted the role of coal-fired (and gas-fired) power generation (AEMO 2020b, 44, Figure 10).

However, recent events, including the announced early retirement of Yallourn-W by 2028, suggest the transition is already moving quicker than the fastest expectations of the above scenarios. Given the confluence of pressures and influences described in this chapter, the end of coal-fired power in Australia is highly likely by 2035, and possibly will occur earlier.

At present, without the benefit of an integrated and orderly national strategy, this transition is likely to occur in a chaotic and uncoordinated fashion with, problems arising for electricity supply security and for the social and economic stability of regional communities supporting power generation. In Victoria, this will most likely lead to the end of brown coal mining; elsewhere, thermal coal currently destined for domestic use could possibly be exported – depending on Australia's coal export markets.

Export coal

Meanwhile, it is likely that Australia will continue to export substantial volumes of thermal and metallurgical coal over the next decade, with existing mines unimpeded by political or policy intervention at either the national or subnational levels. However, it is unlikely that new mines will open, and exports will be into a diminishing global market which will cause the sector to contract by 2040.

Although the Commonwealth Government has a capacity to restrict trade for environmental reasons, its powers have not been used against fossil fuel exports. Attempts using national and subnational environmental laws to encourage or force national governments to close existing coal mines or stop the development of new ones, on the basis of direct harm to individual species and ecosystems (including aquifers), and indirect harm caused by exported emissions, have failed.

There is currently no international mechanism for ensuring an orderly withdrawal from coal trading (although the WTO or even the UNFCCC could perhaps be utilized to establish such a process or measure). Disorderly withdrawal – involving uncoordinated unilateral bans on fossil fuel exports by the national governments of coal-producing states – is seen as merely encouraging substitution from other exporting countries which would be advantaged by that withdrawal. In Australia, calls for unilateral withdrawal have been regarded as fanciful and politically unsaleable.

Discussions toward the establishment of an international mechanism such as a Coal Ban Treaty, to regulate and fairly distribute the economic burden of withdrawal from coal and gas markets are progressing in academic circles but are nascent at best.

Nevertheless, analysts consider that investment in coal exploration and mine development has peaked in Australia, in anticipation of these declines. Cunningham et al. (2019) suggest that Australian coal production and exports are expected to grow fairly slowly, driven by productivity improvements, the restart of some existing mines, and completion of investment projects. However, mining companies generally maintain a cautious approach to any expansionary investment.

Ball et al. note (2020) that there are 42 metallurgical coal projects in the pipeline with a total investment value of $23–31 billion. Of these, 30 are at the feasibility stage 'but progress has slowed' (Ball et al. 2020, 49). Some 53 thermal coal projects in the pipeline which would have a total investment value of $64–74 billion. While 34 of these projects at the feasibility stage, most have not progressed for years. 'Only six projects have committed investment, two are new "greenfields" projects and four are mine expansions' (Ball et al. 2020, 65).

Over the medium/longer term, export markets for Australian coal will contract as power generation and steel production are decoupled from coal use, and demand for thermal and metallurgical coal declines, and as global efforts to counter over climate change intensify. This chapter suggests that Australian coal exports will begin a steep decline by 2035 given these factors.

Conclusions

This chapter finds a rupture occurred in domestic coal-related politics and policy around a decade ago, driven by a conjuncture of political, economic, and ecological factors.

Before then, pro-coal actors in industry and government maintained a hegemonic discourse about the benefits of fossil fuels for Australia's economic future. The national political sphere was seen by pro-coal actors to be where the greatest influence would lie for ensuring favorable outcomes for coal both domestically and for trade. These actors have continued to dominate fossil fuel export policy but failed to recognize the importance of the subnational sphere of governance for domestic energy policy.

The layering of Australia's federal system provided opportunities for subnational policy experimentation unhindered by the deep political schisms and policy paralysis over climate change which affected the national sphere. Nationally, it is still the case that 'neither the Labor Party nor the Coalition, which together account for close to 80% of the vote, offers a strong, reflexive, ecologically modern vision' (Warren et al. 2016, 10) that would lead to an orderly and rapid exit from export coal.

At the subnational level, however, game-changing decisions have established an 'autonomous' track for domestic coal, leading to its accelerating decline.

From the mid-2000s onwards, Premiers of subnational States, acting as policy entrepreneurs, produced the greatest impetus for change. Novel climate laws and targets were transferred from South Australia to other non-coal producing States through processes of political competition, and policy and legislative mimicry and learning.

Meanwhile, a unique combination of considerations – including environment-related interests (ENGOs, the Greens, popular opinion favoring action against climate change), the high levels of emissions from aging power plants burning lignite, and economic factors (such as market-competitive renewable energy alternatives) – led Victoria, a coal producing State, to break ranks and begin to decarbonize in 2010. NSW and Queensland eventually followed.

Subnational measures promoting renewable power initiated a rupture that has led to an emergent alternative energy policy regime that is displacing coal. Whereas subnational political leaders opened the door to mitigation and promoted renewables onto the States' agenda through preferential policy measures, market forces are now irrevocably in control. Initially, policy-assisted, the uptake of cheaper, reliable renewable technologies – now driven almost purely by commercial considerations – is spelling the end of investment in domestic coal- and gas-fired power generation in Australia's electricity sector. There is little that national or subnational governments could now do to stop or even slow the accelerating decline and probable demise of domestic coal over the next decade.

This transformational trajectory is also influencing, albeit much more slowly, the export coal sector. The close relationship between the Australian state, Coalition and Labor political actors, and national and multinational corporate elites, still protects and prefers the interests of carbon capital in that sector. This chapter has argued that coal (and gas) exports have to date grown without significant policy obstruction, despite their massive contribution to greenhouse emissions and to global warming. However, it is now only a matter of time before Australia's coal exports – and its substantial exported embodied emissions – become targets for concerted international and domestic action.

In all, Australia's coal sector can be seen as fractured – temporally, institutionally, geographically, and economically – and in decline. It is divided between the period before and after about 2010. It is split between national and subnational political spheres, and between coal-producing and non-coal producing states. Australia's national climate and energy resource policies run along two separate and increasingly contradictory paths – one domestic and the other export-oriented, a split most clearly evident in relation to coal. The forces reducing the distance between these tracks remain international and subnational rather than national – including the slowly refashioning of demand for Australian coal as importing countries and Australia's subnational states recognize the economic and ecological opportunities that renewables offer, and as growing public alarm at the accelerating threat of global warming reshapes the political landscape 'from below'.

Appendix

This chapter contains supplementary online material at https://www.mcc-berlin.net/pecoal/ch13.

Note

1 These are central, slow, and fast change, step change and High DER (Distributed Energy Resources. 'The Central scenario is determined by market forces and current federal and state government policies. The other scenarios vary in the pace of the transition – a Slow Change scenario with slower economic growth and emission reductions, a High DER scenario with more rapid consumer adoption of DER, a Fast Change scenario with greater investment in grid-scale technology, and a Step Change scenario where both consumer-led and technology-led transitions occur in the midst of aggressive global decarbonisation' (AEMO 2020c, 11).

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14 The political economy of coal in light of climate and mineral-energy policies

A case study from Colombia

Lina María Puerto-Chaves and Felipe Corral-Montoya

Introduction

The rapid coal phase-out required to limit global temperature rise to 1.5°C above preindustrial levels is still lagging behind (Rogelj et al., 2018). Achieving this requires an early retirement of assets in coal extraction and combustion (Spencer et al., 2018). Although coal transitions are underway worldwide in both exporting and consuming countries, coal continues to play a central role in many countries' energy and economic systems (Garg & Steckel, 2017; Gellert & Ciccantell, 2020). Fossil fuel-dependent economies, especially those relying heavily on its exports, are facing structural challenges amidst this context (Peszko et al., 2020). For Colombia, the 5th largest steam coal exporter in the world (IEA, 2020a), the challenge of a changing global energy landscape means navigating a steep drop in international coal benchmark prices that has not only been accelerated by the COVID-19 pandemic but is likely to continue in the context of a global energy transition and more ambitious climate change mitigation commitments (Yanguas Parra et al., 2021).

In this setting, large-scale export-oriented coal extraction[1] dominates Colombia's mineral-energy landscape, as 90% of coal extraction is destined for exports and only 10% is used in domestic industry and power plants (UPME, 2020a). The coal sector in Colombia is significant at a macroeconomic level since it fills important gaps in trade and fiscal deficits through coal export revenues. It also contributes to the local economies of coal extracting regions via royalties, employment, and local expenditure (Patzy, 2021; Patzy & López, 2021). This reliance puts natural resource-based rents at stake in the volatile context of commodity markets (Peszko et al., 2020).

Current responses to this situation have focused on two strategies. First, trying to increase domestic coal demand for electricity generation as implied by the most recent National Energy Plan 2020–2050. While the plan foresees some power plant closures without specific dates, it contemplates at least 1.4 GW of coal-fired capacity to still be online in 2050. This conflates with current plans for new coal-fired power generation units equivalent to a 1.4-GW expansion on top of the existing 1.6 GW in coal-fired capacity (Global Energy Monitor,

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2020; UPME, 2021a; 2021b). Second, assigning hydrocarbons and mineral extraction a pivotal role in the policy package to recover from the COVID-19-induced economic crisis (Atwood & Medina, 2021; DNP et al., 2021), and expanding the international demand horizon of Colombian coal through, amongst others, a "neutral coal" strategy in which coal exports would be directly carbon-offset via reforestation certificates to be accounted in the purchasing country's greenhouse gas (GHG) emissions inventories (Rueda, 2020).

These strategies contrast with Colombia's climate action commitments. The recently updated Nationally Determined Contribution (NDC) for the period 2020–2030 committed to a 51% GHG emissions reduction by 2030 relative to a business-as-usual scenario in which Colombia would emit 345.90 MtCO2eq. This means emissions in 2030 should not surpass 169.44 MtCO2eq, equating to 37.5% less emissions than in the NDC's benchmark year (2015) (MADS, 2020). Despite including mitigation measures in the energy sector, and the need for a just transition of the workforce as a main pillar, the NDC does not contemplate pledges to retire or to not build additional coal-based thermoelectric capacity in the country. In addition to climate policy concerns, coal extraction in Colombia has been subject to multiple accusations and resistance by local communities, NGOs, and sourcing companies that allege weak oversight of the social, environmental, human health, and human rights conditions throughout the Colombian coal supply chain (AFR, 2021; Cardoso, 2015; Indepaz, 2018; Tierra Digna et al., 2015).

The case study is structured as follows. "Case study design" section presents how we crafted the study. "Results" section disentangles the results of our analysis and the objectives we spell out from them. "Discussion" section discusses the results and "Conclusion" section finalizes with our concluding remarks.

Case study design

Amidst this context, we aim to analyze the underlying political and economic interests around coal extraction within the mineral-energy landscape in Colombia based on the "Actors-Objectives-Context" (AOC) framework by Jakob et al. (2020a) covered in Chapter 1. The AOC framework is guided by the idea that policy outcomes are those that reflect the interests of the most influential actors. We identify the actors influencing mineral-energy policies in Colombia, the objectives that matter to them, and the context in which decision-making takes place. To craft the case study, we draw on 21 expert interviews with stakeholders from Colombia's mineral-energy landscape.[2]

Interviews were conducted in Bogotá during November and December 2019 following a semi-structured format and lasting one hour on average. They were conducted in most cases by both authors, helping to reduce risks of interviewer and social desirability bias. Field notes and interviews were transcribed and coded to identify objectives mentioned by interviewees, both their own, and those they attribute to decision makers. Through a triangulation process, we later unified them under three main objectives resulting from contrasting respondents' statements with official documents, reports, and academic literature (Woodside, 2010). This allowed us to identify, compare, and discuss discourse and effective outcomes resulting from Colombian energy, mining, and climate policy.

Results

Based on our main data sources, we show that shifting away from coal in Colombia not only revolves around economic, technical, social, or environmental challenges, but also on political dynamics driven by actors that will be affected by coal's deliberate or unplanned decline. A variety of policymakers, public officials at the national and regional level, and incumbent actors linked to the coal sector play a significant role in Colombia's political economy of coal.[3] After the triangulation process described in the previous section, we find that their main objectives are (i) maintaining revenue streams from coal extraction, (ii) guaranteeing power system reliability and security of energy supply, and (iii) managing socio-ecological conflicts.

These objectives operate in a context influenced by three crucial pillars: first, around discourses of extractive and commodity-based development (Ocampo, 2017; Strambo & González Espinosa, 2020); second, Colombia's historically high reliance on hydropower (Rubio & Tafunell, 2014; Zapata et al., 2018) and the risk of planned new hydroelectric capacity additions failing in a setting of increasing climate vulnerability, as droughts threaten reliability of supply (Henao & Dyner, 2020); third, an antagonistic relationship between government and mining companies on one side, and the actors revealing, resisting, and opposing the negative social and environmental impacts of the coal supply chain in Colombia, on the other (Corral-Montoya, forthcoming; OCMAL & CENSAT Agua Viva, 2016). The following subsections start by briefly pointing out the contextual factors in which these objectives operate and are followed by discussing the outcomes that have been effectively brought about by Colombian climate and mineral-energy related policies.

Maintaining revenue streams from coal extraction

Extractive- and commodity-based growth

The 1980s and 1990s in Colombia brought about a shift from import-substitution-led industrialization toward facilitating the entry and operation of foreign financial and technological capital into the extraction of nonrenewable natural resources as a main driver for development (Corral-Montoya, forthcoming; Vélez-Torres, 2014). This occurred parallel to a process of privatization and denationalization of coal extraction (OCA, 2017), amongst other sectors. Today, transnational enterprises (TNEs) have become increasingly relevant in enabling the creation of a strong coalition between the national government and the mining sector [nsa3]. Through narratives linking natural resource, and particularly coal extraction, to ideas of "development", "progress", or "peace-building" (McNeish, 2017b; Strambo & González Espinosa, 2020), this coalition has been essential in shaping a tax incentive regime facilitating fossil fuels and minerals extraction which averaged USD 3.3 billion per year between 2010 and 2016 (Pardo Becerra, 2018).

In Colombia, most coal extraction occurs in open-pit, capital-intensive, high-impact operations in the Northeast regions of Cesar and La Guajira as seen in Figure 14.1. Since its insertion in the 1980s, large-scale coal extraction was conceived as an export-oriented activity, as no meaningful consumers of steam coal emerged in the Caribbean region and no infrastructure to transport coal inland was built (Corral-Montoya, forthcoming). Second only to hydrocarbons, coal exports have high balance of payments relevance due to, amongst others, Colombia's historically low levels of savings, as well as trade balance and fiscal deficits. This combination of deficits made it paramount for Colombia to increase its exports and attract foreign direct investment (FDI) to avoid a balance of payments and fiscal crisis [nsa3]. Coal and hydrocarbons hence represent over half of total exports and have comprised over 40% of incoming FDI since 1994 (Banco de la República, 2020; OEC, 2019).

This is closely associated with Colombia's commodity-dependence [npa1, nsa5]. UNCTAD (2019) labeled Colombia as a highly commodity-dependent country, with over 80% of exports coming from raw materials. The average share of coal in Colombia's export basket between 2010 and 2020 was 14.6% (DANE, 2020a). This has resulted in a high reliance on fiscal revenues from natural resource-intensive sectors, which are unable to generate linkages in other activities and resulting in a significant lag in manufacturing, and technology sectors (Ocampo, 2017).

Coal extraction in Colombia: employment, revenues, and regional development

Coal extraction was highlighted as a provider of foreign exchange earnings and FDI, as well as a source of employment, technical expertise, and local development [npa2, npa3, npa4, nsa5, ea3]. This discourse contours the political economy of coal in Colombia, but some interviewees mention a gap between it and the real contributions of coal extraction especially at the regional level [nsa1, nsa2, ea2]. For instance, employment opportunities in large-scale coal extraction are scarce, as only 0.9% and 1.8% of employment in Cesar and La Guajira occurs within this activity (Mintrabajo, 2020a, 2020b). Of these, many are temporal workers coming from other regions [nsa1, nsa2, ea2]. In fact, despite representing 38% of La Guajira's population, members of the Wayuu people are marginally employed in coal mining with only 5% of Wayuu employees in the Cerrejón mine, the largest open-pit coal mine in Latin America, operated by BHP, Anglo American, and Glencore [nsa2]. Although the sector is also a source of indirect jobs with often precarious working conditions, the exact numbers are still unknown [nsa2] (Corral-Montoya et al., 2021).

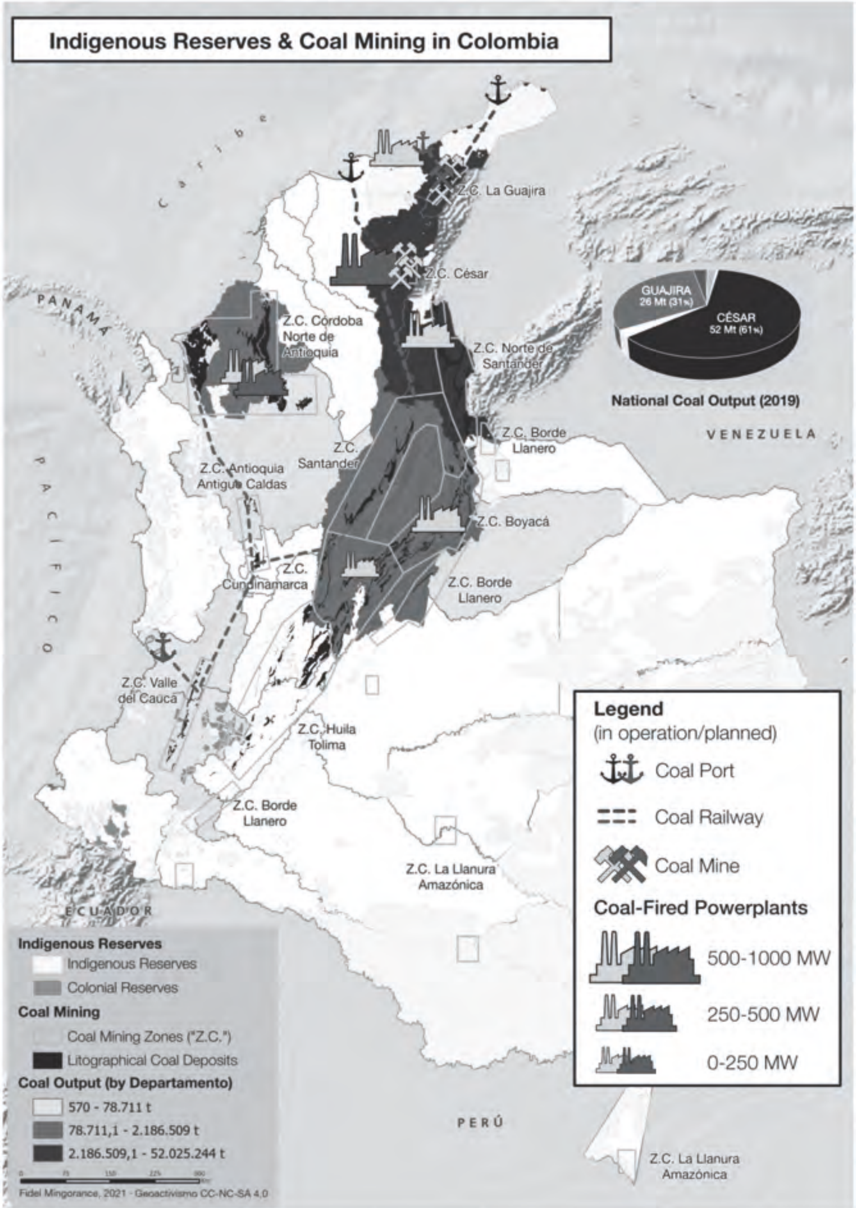

Figure 14.1 Coal mines, coal-fired power plants, and transportation infrastructure in Colombia.

Source: own elaboration based on Mingorance-HREV (2021).

From a regional development perspective, coal plays a key role in shaping the local political economy landscape, as coal mining contributes the most to the General Royalty System (SGR by its acronym in Spanish), which invests in solving basic needs of the *departamentos* and municipalities [isa1, npa2, npa3]. La Guajira and Cesar are the regions that generate the most royalties from coal (85%) (UPME, 2020b), but even after decades of mining bonanza, these regions continue to have high levels of poverty and social exclusion [isa1, nsa4, nsa9]. Nonetheless, by combining the fundamental material necessity to funnel coal rents to low-income mining municipalities, the prospects of additional revenues, and the high external vulnerability of Colombia's balance of payments position in public discourse, decision makers aim to maintain these revenue flows from coal extraction for as long as it is feasible [npa1, npa2, npa3, npa4, ea3].

Appropriation of natural resource rents, and securing or expanding export markets

The strategies to support the objective of maintaining the revenues from coal extraction stem from the idea of seizing Colombia's coal endowment to secure rents [npa4, ea3]. The discussions in this setting revolve around changing the *source of rents*, rather than reflecting on *overcoming rent-dependency* via planned approaches to diversify exports toward products that increase economic complexity [npa1, nsa7]. Considering that Colombia's coal reserves could continue to be extracted at 2017 levels for over a century (UPME, 2012; 2017), the motive of seeking to prolong and appropriate rents explains for some actors [npa3, npa4, ea3] the recent extensions of mining concessions. These extensions, according to an interviewee [npa3], were granted under a regime that provided a higher government take, understood as the sum of all government-directed payments from a natural resource extraction activity (Rudas-Lleras & Espitia-Zamora, 2013). This could also explain ongoing efforts to attract other mining conglomerates to take over the operations of companies that are suspending their activities, like Prodeco, Colombia's 3rd largest coal mining company operated by Glencore, which decided to hand back its mining titles to the government alleging the negative economic perspective from coal (Atwood & Medina, 2021).

Both the National Mining Agency (ANM by its acronym in Spanish) and the Colombian Mining Association (ACM by its acronym in Spanish) are considering strategies to secure export markets for Colombian coal and assure that there will still be a demand for it in the short term [npa3, npa4, ea3]. However, for some actors [npa1, npa6, nsa2, nsa3, isa2], this disregards what market trends suggest, as well as Colombian coal's competitive disadvantage in the Pacific markets due to freight costs that could be almost double than those incurred for coal shipments from Indonesia or Australia (IEA, 2020b; Oei & Mendelevitch, 2019; Yanguas Parra et al., 2021). Strategies to expand market space in countries like China, India, or Turkey have also been considered by the Ministry of Mines and Energy (MME), the ANM, and ACM [npa3, npa4, ea3]. The Colombian mining sector has also highlighted the importance of diversifying the country's mining basket toward copper, gold, and rare-earth extraction (Portafolio, 2020) to overcome the shrinking space of coal exports [nsa8, npa3, npa4].

Guaranteeing power system reliability and security of energy supply

Colombia's historically high reliance on hydropower

Colombia's power system is characterized for its high reliance on hydropower [nsa1, ea1, npa2, npa5, nsa7, nsa9] (Rubio & Tafunell, 2014; Zapata et al., 2018). Since 2006, hydropower has represented over 76% of power generation (UPME, 2020a). Droughts associated with El Niño Southern Oscillation (ENSO) have become more recurrent (Cai et al., 2014). Twice in Colombia's recent history (1992/1993 and 2015/2016), droughts caused by the ENSO phenomenon have reduced hydro-based power generation to the extreme of either causing widespread power outages or needing electricity rationing. To respond, Colombia encouraged the operation and construction of coal- and gas-fired power plants via capacity mechanisms (*cargo por confiabilidad* in Spanish) as a backup to hydroelectric power plants [ea1, npa2, nsa5, npa5] (Olaya et al., 2016). However, when hydrology is normal, thermal power plants operate at low capacity levels, making them financially unviable (Paredes & Ramírez, 2017).

As the climate crisis deepens and vulnerability to extreme weather patterns increases, government and corporate voices have urged to expand (or "diversify") the power system via two strategies. The first consists of large-scale, auction-led deployment of solar and wind projects, mainly in the Caribbean region [ea1, nsa5, npa7] (MME, 2020). In Colombia, solar and wind energy already offer prices of less than 2.5 cents per kWh according to the results of the 2019 renewable energy auction [ea1, nsa5] (Revista Dinero, 2019). The second consists of the refurbishment or expansion of existing gas- and coal-fired power plants, together with the construction of new thermal power stations [ea1] (López-Suárez, 2020). Proponents of this strategy have pointed out the significant delays of the Hidroituango project, a 2.4-GW water dam on the Cauca River which would satisfy over 10% of Colombia's power demand (Henao & Dyner, 2020). Since most energy planners counted on Hidroituango to be fully functional by 2019 [npa5], policymakers were quick to suggest the fast deployment of new gas- and coal-fired power plants to provide reliable electricity instead. These developments could stall additional expansion of renewables risking both renewable energy targets and climate policy commitments [nsa7, isa2] (Arango-Aramburo et al., 2020; González-Mahecha et al., 2019).

Reasons for domestic coal phase-in: security of supply and international coal market developments

Guaranteeing "security of supply" and "energy self-sufficiency" were consistently mentioned as policy priorities in Colombian energy policy [npa2, npa5, e1, nsa1, nsa7] (Martínez & Castillo, 2019). This also applies to the latest National Energy Plan 2020–2050 (UPME, 2021b). Yet, this does not necessarily affect coal extraction, since TNEs responsible for almost 90% of coal extraction in Colombia export over 95% of their output.

As Figure 14.2 shows, of the coal used in Colombia, most is used for final consumption in coking plants and industrial processes (e.g. cement production, and for process heat in paper and food industries, amongst others) [npa3, npa4, npa5]. The coal used for domestic consumption is produced in the Andean region by small to medium, often informal, companies in labor-intensive, underground mines which employ over 60,000 workers (Salazar et al., 2011). As electricity generation in Colombia relies largely on hydropower (Zapata et al., 2018), coal plays a minor role in power generation.

Nevertheless, the ubiquitous threat of electricity rationing and power outages due to more extreme and frequent droughts plays an important role during the energy planning process [ea1, nsa5, npa5, nsa7, nsa9]. Expanding coal- and gas-fired generation capacity is thus invoked by trade associations[4] to diversify the energy mix and provide reliability of supply (ANDEG, 2021). Similarly, they also highlight the low emissions factor of the Colombian electricity mix to justify these additions [ea3] (ibid.). For some interviewees, the role of trade associations has also been instrumental in maintaining the schemes that favor the prioritization of gas- and coal-fired power plants. For example, their active participation in the debates around the carbon tax in Colombia has been fundamental in securing the exclusion of coal and gas in the tax base so far [npa1, npa6, isa1].

Another driver for domestic coal phase-in consists of expanding a domestic market for coal. Current plans for new coal-fired power generation units in Córdoba (TermoBijao), Cesar (TermoLuna), and Norte de Santander (TermoTasajero) imply a 1.4-GW expansion on top of the existing 1.6 GW (Global Energy Monitor, 2020; UPME, 2021a; 2021b). The additional coal-fired capacity in the pipeline is considered by some actors to withstand the narrow prospects from international coal market developments [npa3, npa4, ea3].

Disconnect between climate goals and mineral-energy planning instruments

Our research indicates signs of disconnect between Colombia's climate policy instruments and its mineral-energy policy [isa1, isa2, nsa9]. For instance, the standing National Plan for Mining Development expects to increase coal extraction and prolong exports well after the 2050s [nsa8] (UPME, 2017). Further, the National Energy Plan 2020–2050 expects additions in both coal- and gas-fired power plants by including 1.4 GW of coal- and 2.7 GW of gas-fired power plants by 2050 and contemplates well over half of primary energy to come from fossil fuels (UPME, 2021b). Despite Colombia's commitment to carbon-neutrality by 2050, full decarbonization is still lagging behind in Colombian mineral-energy planning instruments [npa5, isa2].

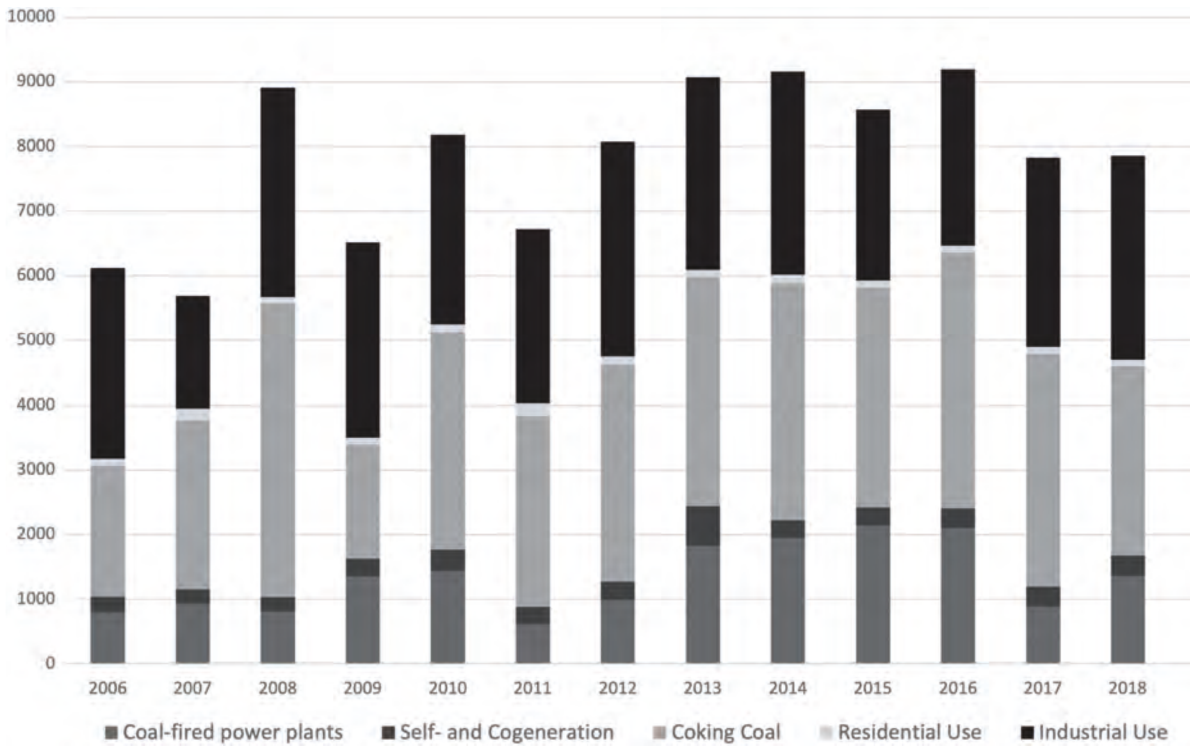

Figure 14.2 Coal consumption by sector (in kt) 2006–2019.
Source: own elaboration with data from UPME (2020a).

If policy is executed as planned (UPME, 2021b), by 2050 Colombia will have important amounts of renewables installed [npa7]. Nevertheless, it will not have phased out fossil-fired power plants in line with its NDC commitments. In fact, according to Gonzalez-Mahecha et al. (2019), building the pipeline of coal-fired power plants in Colombia would double emissions from electricity generation. Further, from a fossil fuel supply-side perspective, Colombia's prolongation of coal extraction could make global climate protection targets even harder to achieve considering that over 80% of coal reserves must remain unburned to meet at least a 2°C warming limit [isa1, isa2] (Lazarus & van Asselt, 2018; McGlade & Ekins, 2015).

All interviewees recognized the risks and causes of climate change and considered addressing it as a top priority for all sectors and actors. However, there were significant differences with regards to concrete actions and policies. For example, some utilities are already scrambling to increase renewables in their portfolios and are invested in their deployment. At the same time, they are considering technology refurbishments to improve the efficiency of obsolete coal-fired generation instead of closing down coal-fired assets [ea1]. Some even consider coal phase-in as an adaptation measure to the vulnerability of the hydro-reliant Colombian electricity sector to more extreme and frequent droughts [npa4, ea3]. In this regard, no consideration is given to how increasing temperatures and water availability could also affect the efficiency and cooling capacity of thermal power plants (Van Vliet et al., 2016), and how the carbon-intensive alternatives proposed worsen the climate crisis that they are aiming to adapt to [nsa9].

Representatives from the mining sector also recognize that climate change is caused by the combustion of fossil fuels [ea3]. Nevertheless, as coal combustion does not occur in Colombia, it is not accounted in domestic GHG emissions inventories [ea3, np4, npa7, nsa7]. This could explain the absence of strategies to phase-out or -down fossil fuel extraction in Colombia's climate policies and their disconnect with energy production [isa1] (Piggot et al., 2020). For some, continuing to bet on fossil fuel extraction and combustion is a risky strategy [npa1, isa2] as reiterated by the 2020 crash in oil prices, and the COVID-19 pandemic (Piggot et al., 2020; Yanguas Parra et al., 2021), and could even increase committed emissions from the electricity sector in Latin America (Delgado et al., 2021; González-Mahecha et al., 2019).

Managing socio-ecological conflicts

Antagonistic relationship between social actors and accumulated socio-ecological liabilities of coal extraction

Since its beginnings, local indigenous, afro-descendant, and peasant communities have opposed coal extraction and its expansion [nsa9] (EJOLT, 2019). According to Vélez-Torres (2014), this was followed by a military securitization strategy to control underground resources and guarantee an attractive investment environment for private FDI and modernization of production. This has resulted in a context in which government and corporate actors have an antagonistic relationship toward mining dissenters who resist the impacts of coal mining [nsa4, ea2, nsa6, nsa9].

Coal extraction in Colombia faces increasing national and international criticism [nsa4, nsa9]. As Cardoso (2015) has pointed out, socio-ecological liabilities exceed the market price of one ton of coal. A report by Tierra Digna et al. (2015) highlights some aspects of the ecological footprint of the extraction, terrestrial transport and maritime export of coal. Some of these include the severe deterioration of resources at the local level like air, water, and soil, posing significant and accumulative health risks to both workers and population adjacent to the mining activity [nsa2, nsa8, nsa4, ea2, nsa6, nsa9]. These impacts affect indigenous, afro-descendant and peasant communities disproportionately due to forced or voluntary resettlements, as well as landscape and ecosystem modifications that gradually restrict the availability of resources and natural conditions on which their traditional livelihoods and identities depend (Strambo et al., 2018; Tierra Digna et al., 2015).

Currently, the four largest coal mining companies in Colombia face accusations of human and environmental rights violations. The UN Special Rapporteur for Human Rights and the Environment has urged some of these companies, to suspend mine operations *"until it can be shown to be safe"* (Reuters, 2020). A complaint filed in early 2021 to the OECD will require government officials from Australia, Ireland, Switzerland, and the United Kingdom to investigate the impacts of the Cerrejón mine under the terms of the OECD Guidelines for Multinational Enterprises (AFR, 2021).

The need to address the socio-ecological conflicts around coal extraction was highlighted by both political and societal actors [nsa1, nsa2, ea1, nsa8, nsa4, nsa5, npa3, ea2, nsa6, ea3, nsa9]. It is also further acknowledged in different policy documents (MME, 2018; Ponce Muriel, 2014; UPME, 2017). However, the management approaches fluctuate between positions that consider socio-ecological conflicts around coal mining as barriers to development [ea1, npa2, nsa5, npa3, npa4, ea3], or as key strategies to resist the unchecked expansion of large-scale projects and its impacts [nsa1, nsa2, nsa3, nsa8, isa1, nsa4, nsa6, nsa9].

Strategies to manage socio-ecological conflicts

Since the Constitution of 1991, the legal mechanisms of "previous consultation" and "popular consultations" became key for citizens to decide on issues that are likely to affect their community [nsa8] (Dietz, 2017). Together with existing environmental legislation and different forms of strategic litigation by organized civil society, these are mechanisms to materialize the rights of participation on environmental issues, derived from international instruments like the Rio Declaration on Environment and Development (Principle 10), the Convention on Biological Diversity, and the International Labor Organization (ILO)-convention 169 [nsa4, nsa9]. However, as some interviewees mentioned, this is often seen as a barrier for development by mining companies, its associations, and government agencies that aim to "smoothen" and "speed-up" the pace of the expansion of projects of national and strategic interest (PINES by its acronym in Spanish), including large-scale coal extractive projects [nsa3, isa1].

The use of popular consultations grew with a widespread rejection from citizens toward extractivism (McNeish, 2017a). In fact, they were effective in banning hydrocarbon exploration from their territories. But this also meant increasing efforts to stop them [nsa4, nsa9]. For example, in 2018, the Constitutional Court stopped municipalities from proceeding with popular consultations, withholding their constitutional prerogative of autonomously deciding what activities to undertake in their territories.

In parallel, the Constitutional Court has also held coal mining companies responsible for violation of fundamental rights. Nevertheless, according to different interviews, their rulings have either lacked clear orders to change said situations or have not been implemented [nsa8, nsa9]. At the same time, the scope of previous consultation with indigenous, and afro-descendent communities has been reduced over the years, while companies have been compelled to engage in large-scale public relations and corporate-social responsibility programs to earn a "social license" to operate [nsa6] (Ponce Muriel, 2014).

Threatened civil society and communities

In Colombia, opposition to mining or infrastructure projects by local communities or civil society has been often stigmatized and even confronted with violence [nsa4, nsa6, nsa9] (OCMAL & CENSAT Agua Viva, 2016). Since 2016, over 1000 human rights defenders and adherents to the peace process have been murdered, many of them opposing large-scale mining, infrastructure, or agroindustrial projects (Indepaz, 2020a, 2020b). Two recent reports show that Colombia is the country where the most environmental defenders are killed each year (Front Line Defenders, 2020; Global Witness, 2020).

The framing of community activists, NGOs and similarly minded groups opposing mining projects, as "enemies of progress and development" makes them targets of armed actors associated with the rents inherent to natural resource extraction [nsa4, nsa6, nsa7, nsa9]. However, ongoing judicial or scholarly inquiries have not unequivocally revealed which actors are behind it. Discussions about the transition toward a post-coal Colombian economy should engage in an intercultural dialogue that includes different approaches on territorial development, mitigation, restoration, and reparation of liabilities to overcome the lack of trust resulting from long-standing inequalities [nsa9]. Such lack of trust has been recognized in other cases of structural transformation as an aspect that could undermine transition processes (Atteridge et al., 2020).

Discussion

Coal extraction in Colombia is indeed associated with employment, revenues, and regional development (Ponce Muriel, 2014), but not necessarily as much as suggested by some of the political and economic actors from our dataset. We observe that many societal actors systematically question the real contributions of this activity by highlighting the manifold socio-ecological impacts associated to it, as well as the significant developmental lags in the coal extractive regions. National statistics show that the mining sector is the main economic activity of both *departamentos* of La Guajira and Cesar, representing 37% and 40% of their regional GDP, but only 0.9% and 1.8% of employment, respectively (Mintrabajo, 2020a, 2020b). Similarly, both *departamentos* together generate the most royalties from coal (85%) (UPME, 2020b). However, they are still amongst the top 5, out of 32, poorest Colombian *departmentos*, not only in monetary terms, but also in terms of multidimensional poverty (DANE, 2020b).

In Colombia's political economy, coal actors have a diverging set of available resources and capacities to mobilize them to pursue their objectives effectively (Avelino & Rotmans, 2009). For example, linked to the objective of maintaining revenue streams, political and economic actors have managed to mobilize resources to support coal extraction for decades to come (Atwood & Medina, 2021). This occurs in a context in which the COVID-19 pandemic has accelerated the trend of shrinking external markets for Colombian coal. Given that a global energy transition is advancing and more ambitious climate action is being set forth toward full decarbonization, there are few prospects that demand for Colombian coal will bounce back to pre-COVID-19 levels (Yanguas Parra et al., 2021). At the same time, the market reality for Colombian coal suggests that consumers in Asia are not an option, as they are already being amply supplied, in some cases, have already increased their climate ambition, and will privilege their own coal before favoring external imports (Oei & Mendelevitch, 2019).

Regardless of this scenario, the Economic Recovery Policy set to withstand the COVID-19-induced economic crisis reiterates its support to hydrocarbons and mineral extraction which, according to the policy document, "*are relevant sectors to economic recovery due to their contributions in terms of royalties, taxes, foreign direct investment and economic considerations in favor of the nation*" (DNP et al., 2021, p. 40). Similarly, to expand the horizon of Colombian coal, the ANM is currently planning a "neutral coal" strategy consisting of selling Colombian thermal coal with an associated offsetting percentage of GHG emissions for the purchasing countries (Rueda, 2020). As mentioned by the ANM, the strategy aims to maintain the income from coal extraction while advancing a just transition process and accelerating the transformation of coal-extracting territories (ibid).

Continuing to bet on coal, however, risks stranding assets on both the extraction and combustion sectors. Furthermore, additional investments in coal-fired capacities in Colombia linked to the objective of guaranteeing power system reliability and security of energy supply could increase committed emissions from the electricity sector in Latin America and imperil large economic resources to cater other necessary investments (Delgado et al., 2021; González-Mahecha et al., 2019). This reveals the tension between Colombia's increasingly ambitious climate pledges and the reality of its minerals-energy and economic recovery policies.

According to the updated version of the NDC for the period 2020–2030, the country pledged to limit emissions to 169.44 Mt of CO2eq in 2030 – a 51% reduction in comparison to the GHG emissions baseline (MADS, 2020). The power sector is one of Colombia's fastest-growing sources of GHG emissions (Crippa et al., 2019), and ca. 92 MtCO_2eq came from energy use (power generation, industry, and transportation) in 2018 (Climate Watch, 2021). In this regard, Colombia's government proposed three energy-related measures seeking to mitigate 5.91–11.21 Mt of CO2eq. (MADS, 2020). These include actions to increase energy efficiency, reducing peak loads via demand-side management and diversifying the Colombian energy mix. Key government policies and initiatives have thus aimed at considerably increasing the deployment of renewable energy, mainly large-scale wind and solar parks [ea1, npa5, isa2, nsa7, npa7] (MME, 2020). Nevertheless, measures to progressively reduce coal extraction in line with the global carbon budget, or commitments to not build fossil-fired power plants are absent from these discussions [isa1, isa2, nsa9]. Although the National Energy Plan 2020–2050 mentions a phase-out of inefficient and old power plants,[5] neither dates nor further specifics are given (UPME, 2021b).

Concerning coal extracting regions, the prospects for a just transition are at a key juncture. Compared to the coal peak in 2017, coal extraction in Colombia had fallen by 13 million tons and exports by over 30 million tons in 2020 (see Figure 14.3) (UPME, 2020c). The steep drop not only resulted from the sharp fall in coal prices, but also from the decision to return mining titles by Prodeco, CNR's bankruptcy, and a 3-month strike at the Cerrejón mine (Patzy, 2021). Societal actors such as local stakeholders in coal extracting communities, labor unions, municipal authorities, and political actors in the opposition are concerned about an unplanned mine retirement process with weak oversight. These actors are pushing for a just transition dialogue that harmonizes mineral-energy policies with long-term decarbonization goals, which can therefore be an opportunity to successfully address the profound trust deficits stemming from long-standing inequalities and historically accumulated impacts from coal extraction.

The need for a just transition has also been pointed out by political actors in the government. For instance, in 2019 the Ministry of Labor and the ILO launched the pact for green employment and a just transition (ILO, 2019). More recently, in its updated NDC, Colombia included the just transition of the workforce toward a low-carbon and resilient economy as one of its strategic pillars (MADS, 2020). Although the guidelines of these processes are under preparation and the government has not specified which sectors will be prioritized, the current focus is to implement skills relevant for a green economy like manufacturing, construction, renewable energy, and energy efficiency (ILO, 2019). Whether the coal extraction sector, along with its workers and communities, will be prioritized within these processes is to be seen. In the meantime, the "neutral coal" strategy, still under definition by the ANM, is

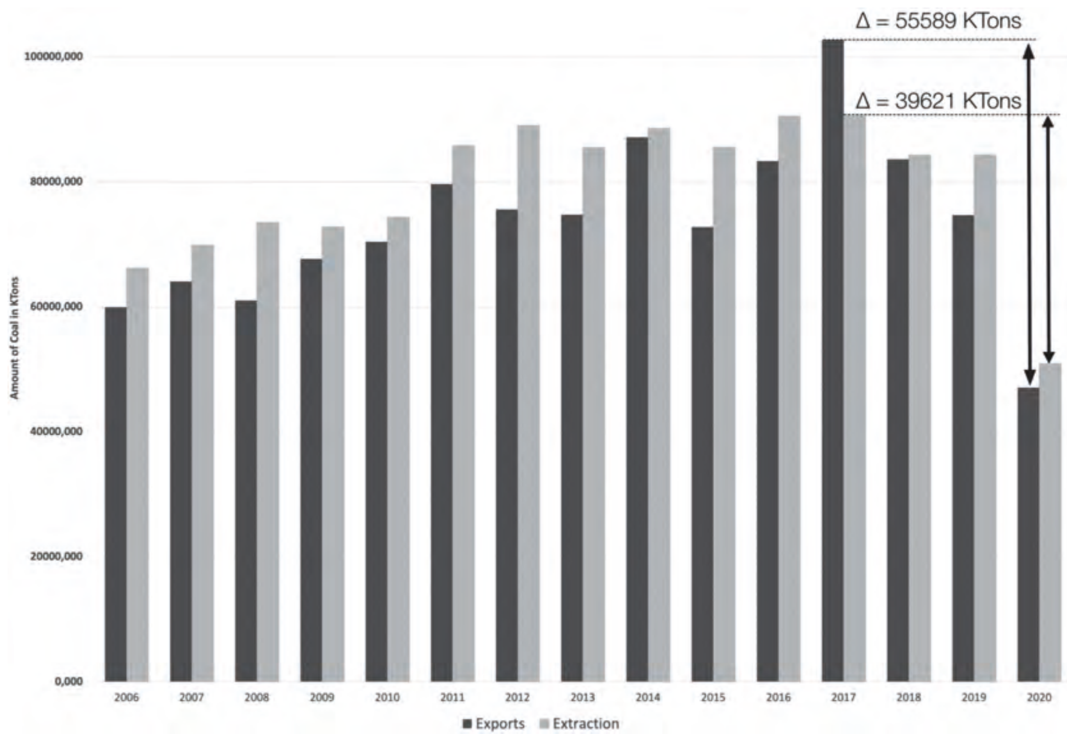

Figure 14.3 Coal extraction in Colombia since 2006.

Source: own elaboration with data from (UPME, 2020c). Extraction and export volumes for 2020 were calculated adding the data from Colombia's three main coal mining companies, Drummond, Cerrejón, and Prodeco.

planned to fund a just transition policy based on increasing coal extraction and expanding its demand horizon.

Yet, any effort to pursue a just transition should in any case consider broadening the concept of just transition from only employment considerations toward comprehensive societal aspects like regional economic development, poverty alleviation, energy access, environmental and climate justice to ensure the transition is equitable [npa1, isa1] (Jakob et al., 2020b). Given that the costs and opportunities of the transition will not be evenly distributed among the different stakeholders, considering the interests of different actor groups may contribute to sharing the costs fairly (Atteridge & Strambo, 2020). If the just transition is expected to be inclusive, such a process should also acknowledge and address the long-standing inequalities and accumulated negative social, environmental, and economic impacts from coal extraction as a means not only to manage, but to eventually solve socio-ecological conflicts [nsa4, nsa6], the third and last objective resulting from our research.

Conclusion

Our case study analyzed the political economy of the mineral-energy landscape in Colombia with a focus on large-scale export-oriented coal extraction. Based on the "Actors-Objectives-Context" (AOC) framework by Jakob et al. (2020a), we identified the actors, their objectives, and the context in which their interests operate. The actors influencing coal-related policies in Colombia are currently pursuing three main objectives with outcomes that reflect their resources and capabilities to mobilize them.

First, maintaining revenue streams from coal extraction was mentioned by some political and economic actors in combination with employment creation and regional development to justify the continuation of this activity. However, other societal actors question its real contributions especially in coal extractive regions that continue to have high levels of poverty, exclusion, and suffer the negative social and environmental impacts along the coal supply chain. Policy outcomes on this regard are currently resulting in the prolongation of this activity by aiming to secure or expand market space for Colombian coal.

Second, guaranteeing power system reliability and energy security is profoundly linked to Colombia's hydro-reliant and thus climate vulnerable power system. Even if solar and wind energy alternatives already offer competitive prices, some political and economic actors point out significant delays in renewables deployment to justify additions that could double current coal-fired capacity. Phasing in coal is considered as another way to secure markets for domestic coal, however, it reveals a disconnect between energy planning instruments and Colombia's climate change commitments. In the context of a shrinking demand of Colombian coal, this also risks stranding assets and imperils the availability of economic resources necessary to cater the urgent investments of a post-pandemic recovery.

Third, managing socio-ecological conflicts was identified as an important objective by both political and societal actors, despite significant differences in management approaches. For some political and economic actors, the conflicts around coal mining are seen as barriers to development. This has resulted in limiting action space for local and ethnic communities to question and resist the unchecked expansion of large-scale projects and its impacts. Societal actors, in turn, demand a more vocal role in the ongoing process to shape Colombia's energy transition and any related just transition efforts.

In the pathway toward a post-coal future in Colombia, we observed that different actor groups have historically felt and are currently experiencing, the gains and losses of the transition unevenly. Actors seeking to attain ambitious climate policies, while engaging in just transitions that are genuinely inclusive, should consider that the burdens and benefits of unfolding transitions can only be fairly shared when a truly participatory and intercultural dialogue occurs, in which actors are able to discuss different approaches on territorial development, mitigation, restoration, and reparation for the losses during the past decades of fossil fuel extraction. Understanding the political economy of coal in Colombia and the claims within the mineral-energy and climate change spectrum thus constitutes an important analytical element that may contribute to advance dialogues on a just transition.

Acknowledgments

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Appendix

This chapter contains supplementary online material at mcc-berlin.net/pecoal/ch14.

Notes

1 As most coal in Colombia is extracted by a reduced group of companies for export, we conceive the constellation of actors, objectives, interests, and context to be very different for them, than for those actors linked to small-/medium-sized coal extraction companies catering for Colombia's domestic consumption (see Reasons for

domestic coal phase-in: security of supply and international coal market developments section). This case study is focused on the former, and whenever it is necessary, we will refer explicitly to the latter.

2 Refer to the Online Appendix for the list of interviews.

3 We use the following actor classification scheme to ease their citation. Each interview is referenced in the text with the corresponding abbreviation and a number as it appears on Table A14.1 in the Online Appendix.
   - National political actors (NPA)
   - Economic actors (EA)
   - National societal actors (NSA)
   - International societal actors (ISA)

4 See Table A14.2 in the Online Appendix for a detailed list.

5 Coal-fired power plants in operation have an installed capacity of 1.6 GW and an average age of 34 years with the first units being built in 1963 and 1964 (UPME, 2016).

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15 Coal, power and coal-powered politics in Indonesia[1]

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Introduction

Indonesia is the fourth most populous country in the world. With 31 GW of coal-fired capacity currently in pre-construction or construction phase, the country ranks fifth among the global leaders in terms of future coal-fired (Shearer et al. 2020). Indonesia is also a major producer of coal. It is currently the fifth largest coal producer and largest coal exporter in the world. However, despite significant production of fossil fuels, 8% of its 265 million inhabitants or approx. 20 million are still without access to electricity. The country's energy strategy regards domestic energy resources, including coal, as *national development capital* to promote economic development (DEN, 2014). Despite the prominent role of coal in Indonesia's energy strategy, the country has committed to reducing its greenhouse gas (GHG) emissions. Under the administration of president Joko Widodo ("Jokowi"), who was elected in 2014, Indonesia joined the Paris Agreement and committed to a GHG emission reduction target of 29% below business as usual by 2030 (MOEF 2016). However, the continued development of coal-fired power plants represents a major threat to Indonesia's efforts to reduce GHG emissions. The government has acknowledged the high growth of investment in fossil power generation. If unchecked, energy-related GHG emissions could overtake the land-use sector as the major contributor in a few decades (MOF 2009; Resosudarmo und Jotzo 2011; MOEF 2015; Jotzo 2012).

The contradiction between aiming to reduce GHG emissions while promoting coal use raises the question of which underlying reasons are driving the envisioned increase of coal-fired power plants. Our analysis begins with the hypothesis that Indonesia's energy and climate policies arise from the complex interaction of different actors with different objectives. To provide a comprehensive, theory-guided analysis of the political economy determinants of Indonesia's expansion of its coal-fired power sector, we follow the framework by Jakob et al. (2020) covered in Chapter 1.

The previous literature has identified political drivers as pivotal to the prevalence of fossil fuels in Indonesia's energy system, despite fluctuating fossil fuel prices, environmental concerns and a green growth rhetoric in policy plans

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(Dutu 2016; Anderson et al. 2016; McCarthy und Zen 2010; Gunningham 2013; Marquardt 2014; Atteridge et al. 2018; van Schaik et al. 2016). The political economy of Indonesia's energy policy has been the subject of analysis in recent literature. Bridle et al. (2018) analyze the political economy of Indonesia's renewable energy (RE) targets. They map the most relevant actors and conclude that the coal mining industry and the state-owned electricity utility Perusahaan Listrik Negara (PLN) are influential but unsupportive of RE deployment. Atteridge et al. (2018) provide an analysis of the political economy of coal in Indonesia. They identify the main drivers of coal production as decentralization of the allocation of mining permits, revenue sharing in the administrative and fiscally decentralized Indonesia, as well as political links to coal mining and the norms and interests shaping domestic energy policy. In their view, Indonesian energy policy is shaped by the goals of reducing dependence on imported fuels and relying on domestic natural resources as the basis for economic and social development.

We base our analysis on qualitative social science research methods and conduct semi-structured expert interviews with key stakeholders of Indonesian energy policy (Bogner et al. 2009). We developed an interview questionnaire (online appendix) and conducted all the interviews using this guideline. If consent was given, the interviews were recorded and a transcript was prepared. Content analysis was performed by coding transcripts and interview notes. As a starting point, we analyzed how frequently interviewees referred to the explicitly stated policy objectives by the Indonesian government, both in general as well as specific to energy and climate policy (Diekmann 2007). Within these objectives, sets of coherent content were grouped and put in relation to each other, thereby elaborating on actors and contextual factors, representing the core analysis of this chapter.

A total of 45 interviews were conducted in March and April 2018 with a total of 82 expert stakeholders of Indonesian energy policy. To ensure a sufficiently large sample, we considered interviewees from different sectors, for example, the government, the private sector, research institutes, development cooperation agencies and civil society. In order to consider possibly different perspectives between the national and provincial levels, interviews were conducted not only in Jakarta but also in the city of Samarinda, the capital of the province of East Kalimantan, one of Indonesia's major coal mining provinces. The online appendix provides a comprehensive overview of the key characteristics of the survey sample and the surveying instrument.

Energy sector and climate policies in historical perspective

Indonesia's energy sector has been historically determined by the prevalence of state-owned enterprises (SOEs), with both Pertamina (oil and gas) and PLN (electricity) being under state control. The Ministry of State Owned Enterprises (MSOE) was created in 1998 to formally separate the functions of shareholder and regulator of companies (Tjager 2000). The MSOE is the shareholder of

PLN, while the Ministry of Energy and Mineral Resources (MEMR) retains the function of regulator in the electricity and mining sectors (IEA 2015). As a loss-making entity, PLN sells electricity below production costs and hence requires subsidies to operate (Harrington 2017). Due to the relevance of energy subsidies in Indonesia's public budget, the Ministry of Finance (MOF) is responsible for overseeing PLN. Subsidy allocation is determined by the Parliament and the MOF. PLN generates the majority of the country's electricity and has an effective monopoly on all power grids. Independent power producers (IPPs) must enter into power purchase agreements (PPAs) with PLN, which can negotiate favorable conditions for itself or otherwise refuse to agree on PPAs (Harrington 2017; IEA 2015).

The country's current national energy policy, Kebijakan Energi Nasional (KEN), the national energy plan (RUEN) and the "*Master Plan Acceleration and Expansion of Indonesia Economic Development*" envisage that more than 30% of the total primary energy supply (TPES) will be provided by coal by 2025 and at least 25% by 2050 (DEN 2014; Coordinating Ministry for Economic Affairs 2011). One of the main projects of the Jokowi administration is to build 35 GW of additional power plants, of which approximately 20 GW are coal. Another key target is to reach an electrification rate of 100% by 2024 through PLN's rural electrification program (RPJM 2015–2019, RUKN 2018–2025). Since 2013, there has been a gradual phase-out of electricity subsidies and a corresponding rise of tariffs for end consumers (Burke und Kurniawati 2018). Electricity tariffs were, however, frozen in 2018 and 2019 (IEEFA 2018). To reduce costs for PLN, the MEMR has capped the price of coal sold to PLN for power generation at 70 USD per ton, which is well below the market price of recent years. As long as the market price for Indonesian thermal coal is above 70 USD per ton, this so-called Domestic Market Obligation (DMO) represents a subsidy to PLN for coal consumption.[2]

Political determinants of energy policy formulation

Based on the interview material collected, we structure our analysis according to the most relevant energy policy objectives. We identify and group four main objectives critical to understanding Indonesia's current energy policy and its ongoing focus on coal. These include (1) the development of infrastructure (power plants, rural electrification, transmission and distribution networks), (2) fiscal sustainability (such as the reform of energy subsidies, while at the same time keeping low electricity prices), (3) securing the markets for the coal industry and (4) climate and environmental protection. Figure 15.1 presents an overview of these four main energy policy objectives against the share of interviewees in each interviewee category who mentioned that the corresponding objective is important for policy formulation (without necessarily implying that the objective matters for them). Table 15.1 presents an overview of objectives, actors and the contextual factors shaping the formulation of Indonesia's energy policy.

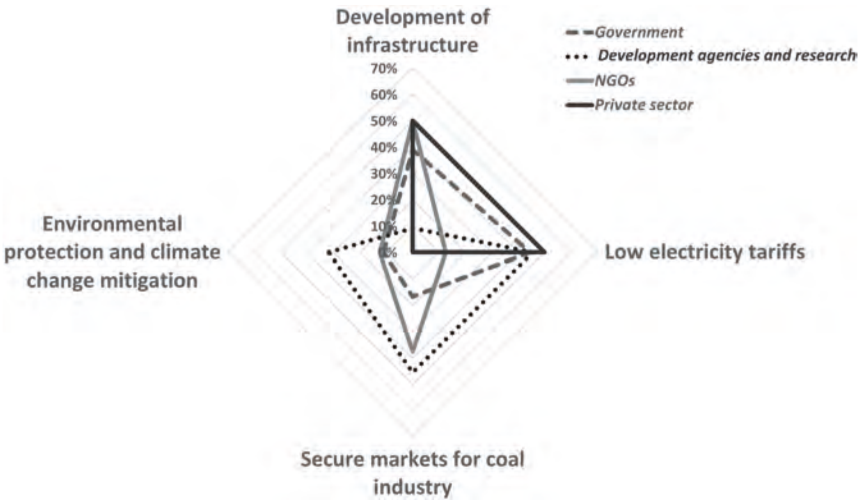

Figure 15.1 Share of interviewees naming the respective energy policy objective across each interviewee category.

Table 15.1 Objectives, actors and cross-cutting contextual factors of energy policy

Objectives of energy policy	*Most relevant actors*
Development of infrastructure *(develop 35 GW power plant capacity increase rural electrification ratio to 100% by 2015)*	*President, Ministry of State Owned Enterprises, PLN and other SOEs*
Fiscal sustainability *(public budget reorganization, low electricity tariffs)*	*President, population, MOF*
Secure markets for the coal industry *(create domestic demand for coal)*	*Coal Mining industry, IPPs, GOI, key functionaries with vested interests in coal*
Environmental protection and climate change mitigation *(deforestation, local water and air pollution, GHG emission reduction, development of RE)*	*Ministry of Forestry and Environment, NGOs, international donors, population in coal mining sites*
Cross-cutting contextual factors	
High SOE share in the economy and SOE-driven infrastructure development	
Decentralization and young democracy	
Corruption, lack of governance, sporadic nature of policymaking (ad-hockery)	
Historical legacy of natural resource extraction and resource nationalism	
Forthcoming national elections	

Source: Own elaboration.

Development of infrastructure

This subsection discusses why infrastructure provision constitutes a central objective for Indonesian policymakers and explains how SOEs are employed to reach this target.

Provision of infrastructure

Numerous interviewees [sn2, sn3, sn4, sn6, epun2, pn4, sn11, epun4] identified the provision of public infrastructures, such as power plants, roads, highways, harbors and airports, as the central priority in the political agenda of the Jokowi administration. Energy policy is embedded in this objective, with the two most prominent programs in the power sector, the rural electrification program and the 35 GW fast-track program, forming part of this. The 35 GW fast-track program for the power sector is a particularly important driver behind the massive increase in coal-fired power infrastructure.

In the context of the 2019 election, Jokowi's popularity was presumed to be judged against his ability to show progress in the 35 GW fast-track program and the rural electrification program. Ray und Ing (2016) as well as Warburton (2017a) assert that demonstrating success in delivering infrastructure and public services is pivotal and a critical test to the popularity of Jokowi, which explains the urgency behind the government's power sector investments. Regulatory complexity in Indonesia has historically constrained the involvement of the private sector in infrastructure investments (Kim 2018). For this reason, Jokowi's administration has aimed at attracting private investment by reducing bureaucracy, simplifying procedures to obtain permits and fostering deregulation. In 2015 and 2016, Jokowi announced ten economic reform packages, as well as plans for a "big bang" loosening of restrictions on foreign investment in nearly 50 sectors (Ray und Ing 2016). In 2017, MEMR presented a considerable reduction and simplification of permits and procedures required for the private sector's participation in the energy sector; whereas IPPs previously required hundreds of permits, they now only need ten permits for conventional electricity and six permits for RE projects.[3] The effectiveness of these measures to attract private sector investments might be overshadowed by frequent unexpected policy changes ("ad-hockery") in Indonesian policymaking, creating an adverse investment climate for investors [ei2, sn8, si12]. In addition, the two most pressing obstacles for infrastructure development, land acquisition and access to finance, have not been addressed by Jokowi's administration (Damuri und Day 2015; Warburton 2017a; Kim 2018; Ray und Ing 2016).

The role of SOEs

Next to the simplification of permitting procedures to attract private investments, Jokowi's administration has actively relied on SOEs to implement his infrastructure agenda [ei2]. The president has referred to SOEs as the agents of development and noted that their responsibility is to build as much infrastructure as possible (Kim 2018). Jokowi's administration changed the government's strategy toward SOEs, based on the belief that SOEs are able to quickly deliver infrastructure, fix market failures and support the fiscally constrained government (Kim 2018; Prabowo 2019). By acquiring loans, issuing bonds, revaluating assets and merging companies, SOEs are used to overcome budgetary restrictions, such as the 3% of GDP deficit limit imposed on the government (Nikkei Asian Review 2017; Prabowo 2019). In the power sector, this became visible in 2016, when MSOE pushed the strategy to revalue PLN's assets, replacing the previous valuation at purchase prices. New values were calculated retroactively to 2015, more than doubling PLN's assets from 539 trillion Rp. to 1,227 trillion Rp. within a year and making it possible to generate debt to finance its expenditures (New Mandala 2018). The MSOE, as shareholder of Indonesia's SOEs, hence represents a central actor within Jokowi's infrastructure agenda. Consequently, interviewed stakeholders referred to the MSOE as being "*the bank*" or "*owners of the country*" [SI6]. Similarly, numerous interviewees have described PLN as a powerful SOE, which is hard to regulate. One interviewee called PLN "*a very a muscly SOE*" [ei1], while another stated that "*If PLN is in conflict with the Ministry of Energy, they most likely get their requested outcome*" [sn3]. Interviewees explained PLN's power as due to being under "*a protective umbrella of MSOE*" [si7] and even characterized PLN to be "*more powerful than MEMR*", PLN's formal regulator [sn4].

The SOE-driven infrastructure development approach must be interpreted against the historical trajectory of state control over key industries. SOEs are easier to control than private companies (Prabowo 2019). There exists a trend toward the rise of resource nationalism in the energy sector, as an ideology among Indonesian policy (Mietzner 2015; Warburton 2017b; Aspinall 2016), and the latest 2009 Law on Mineral Resources and Coal is one prominent example. The law replaced the previous system of "*contract of work"* for foreign investment in mining projects (granting contractual security and a fixed royalty rate for a defined time period) with a system of licenses that can be revoked by the government with ease (Boyd et al. 2010; Lucarelli 2010). Furthermore, the law stipulates that foreign shareholders should divest a share of at least 51% by the 10th year of production and incorporates a ban on exports for non-processed mineral ores in order to incentivize the creation of local added value (Lucarelli 2010). Another example is the 2014 energy strategy, introducing the paradigm of using natural resources as *development capital*, while stipulating a coal production cap at 400 Mt per year (Table A15.1). If enacted, the coal production cap would limit export possibilities and prioritize the domestic market. However, the cap is ineffective so far and identified not to be of relevance in Indonesian energy policy (Cornot-Gandolphe 2017).

Fiscal sustainability

Indonesia's energy policy is shaped by the goal to reduce energy subsidies to free up financial resources for infrastructure investment, while at the same time trying to maintain low energy prices. In the following, we discuss how both goals interact with coal investments.

Reorganization of the public budget

With Jokowi's administration prioritizing the development of public infrastructure, redirecting public budget for infrastructure development has become a domain of energy policy. The latest electricity and fuel subsidy reforms have been driven by the need to redirect a substantial proportion of public budget toward infrastructure development (Damuri und Day 2015; Yusuf und Sumner 2015; Ray und Ing 2016). While the infrastructure budget increased by more than 2.5 times between 2014 and 2018, energy subsidies declined to approximately one-third of their 2014 level, representing 5% of Indonesia's public budget in 2018.

PLN has gradually increased electricity tariffs as part of the broader energy subsidy reform. In line with the reform, PLN's budget for subsidies, allocated from the public budget, has been constantly reduced. However, in the context of the 2019 presidential election, the MEMR stipulated that electricity tariffs would not be increased during the 2018 and 2019 national electoral period, given the possible loss in popularity for President Jokowi that might result from raising tariffs [pn1, pn5]. Yet, the parliament has continued to reduce the subsidies budget allocated to PLN, requiring it to recover its costs under existing tariffs. These frozen electricity tariffs have put a substantial burden on the financial health of PLN [pn5] and PLN has lobbied MEMR to help reduce its costs. This has resulted in the implementation of the "domestic market obligation", stipulating that domestic coal must be sold to PLN at a maximum price of USD 70 per ton [epun1, pn1]. Furthermore, in the effort to reduce the costs of PLN, national feed-in tariffs for RE sources were abolished in 2017 (Table A15.1).

Maintenance of low electricity tariffs

With a perceived development lag behind more developed countries in the region, maintaining "affordable electricity prices" was widely reported to be a goal of current energy policy in Indonesia, both with regard to providing electricity cheaply to households [si1, si2, si3, si4, sn3, si6, si9, epun2, sn13, epun5] and as a requisite for industrial development [sn12, sn13]. This is also reflected by the 35 GW fast-track program to improve the electricity infrastructure for industry and the rural electrification program to improve access for the poor. Both of these programs represent electoral promises, while the provision of affordable electricity can be related to Jokowi's political narrative and image as a "*man of the people*" (Mietzner 2015). However, the energy subsidy reform, necessary for the government to redirect funds for infrastructure development, was feared, if mismanaged, to result in a loss of popularity in the 2019 election. Electricity tariffs must be adjusted automatically every three months to the price of oil, inflation and the exchange rate. Yet, with a letter by MEMR's Minister Ignasius Jonan to his staff, this automatic mechanism has been paused, resulting in unchanged tariffs for the years 2018 and 2019 [pn1, sn9]. This change in regulation has been interpreted as being driven by the need to maintain popularity during the 2019 presidential election [pn1].

The provision of cheap and abundant electricity is seen by the government as a prerequisite to attract investors, maintain competitiveness and foster the industrialization of the country [sn12, sn13]. Furthermore, coal-fired power plants are considered the cheapest means to supply electricity, and thus to achieve the goal of sustaining low electricity prices [si4, si9, si13, sn12, sn13]. A high proportion of coal in the power sector plans is primarily attributable to its affordability compared to that of RE sources [epun3, epun5]. As stated by one interviewee, "*PLN carries on with what they want, regardless of what ministries say … PLN will definitely do RE if costs are lower. It's purely costs*" [epun3]. Even though RE projects might represent a technical and organizational challenge, this is considered less problematic than the issue of costs [epun5]. Indeed, financing RE projects in Indonesia is substantially more expensive than for coal, particularly IPPs, which face high interest rates of well over 10% on debt for their projects. Land acquisition and the risk of a lack of stability in political regulations regarding RE support were regarded as the greatest barriers to raising finance for RE projects [si12, ei2, si10]. In addition, domestic banks were considered to lack experience with RE projects. Despite major differences, banks use the same risk-assessment schemes for RE projects as conventional power projects [si10].

Secure profitability of the coal industry

Coal, in particular coal mining, is an important economic sector in Indonesia that largely contributes to the government's budget. It is highly influential in national and local politics [sn1, ei2, sn4, sn10, sn13]. Arguably, in Indonesia, coal is not only promoted for economic reasons but also through political pressure resulting inter alia from vested interests. Coal receives political support as a means to generate public revenues at various levels and accelerate regional development.

Creation of domestic coal demand

Coal mines are highly concentrated, with the biggest six companies accounting for 70% of domestic sales and 60% of exports (Lucarelli, 2018). Exports to India and China dropped significantly in recent years, respectively, creating uncertainty regarding the future of major export markets. Indonesia's coal mining industry has identified the expansion of the domestic market as a way to secure its future demand (Harrington 2017), confirmed in our interviews [epun1]. Interviewees asserted that the high proportion of coal in the 35 GW fast-track program resulted from the efforts of the coal mining lobby [sn1, sn3]. In particular, during a time when coal export markets were decreasing, the coal industry sought political support to secure its existence: "*Jokowi's 35 GW was a* *reaction to low coal market prices suffocating the industry*" [sn3]. Thus, the relatively low costs of coal, the infrastructural agenda driving the general deployment of power plants, vast reserves of coal in the country and a narrative of economic nationalism all support the coal lobby's interest in energy policy [sn13, sn5].

The coal mining industry also plans to diversify its business model or maximize the coal production rate. Representatives of one of Indonesia's largest coal producers stated that they understand themselves to be a diversified energy company and they would invest in RE, given a good business case [epun2]. Similarly, an interviewee stated that the coal mining industry is more concerned about getting into the RE business than trying to block its emergence [epun3]. Diversifying their business model into the wider provision of energy services was reported for be partly driven by the risk of global commodity price fluctuations to undiversified mining companies [sn1, epun2, si13]. Finally, in view of changing energy markets, some coal mining companies were reported to maximize their current production rate within their concession area to liquidate their assets.

Public revenue from coal royalties

Maximizing public revenue collection from coal, oil and mineral resources' production is a major goal of Indonesian energy policy, which gives the government an incentive to support coal production. Every year, a national non-tax public revenue (primarily through royalties) collection target related to coal and mineral resources is imposed on MEMR by the parliament and MOF. In 2017, this target amounted to approximately IDR 33 trillion, up from IDR 27 trillion in 2016. The significant drop in global oil prices in 2014–2015 combined with a declining oil and gas output in Indonesia led to royalties from oil and gas significantly declining (from IDR 78 trillion in 2015 to IDR 44 trillion in 2017) (Reuters, 2018). In contrast, the production price for Indonesia's benchmark thermal coal (Harga Batubara Acuan) has steadily increased from USD 49 per ton in 2008 to USD 87 per ton in 2017. Consequently, coal-related royalties are seen as a way to replace declining oil revenues (Reuters, 2018). With coal royalties representing 13.5% of the sale price, coal production is largely determined by the public revenue target. A representative of the local government in the province of East Kalimantan, where nearly all Indonesian coal is produced, stated that the number of coal mining licenses is altered to support target achievement [pn6]. In the context of fiscal decentralization,[4] coal mining represents a profitable activity for resource-rich regions that can retain a substantial share of the public income generated. In particular, 32% of coal royalties accrue to district government, 16% to the provincial government, 32% to other district governments in the province and the remainder to the central government (Art. 15 of Law No. 33/2004). With East Kalimantan and South Sumatra having nearly all the coal reserves in the country, these provinces and their internment districts are independent of national revenue-collecting targets, a strong incentive to develop coal.

Private profits and vested interests

Key political functionaries reportedly own assets in the energy and mining business [si11, sn6, sn7, si12, sn10, sn11, si13]. One key player is Luhut Binsar Pandjaitan, former business partner and key supporter of Jokowi, who was Coordinating Minister for Maritime Affairs during Jokowi's first term (the coordinating ministry with oversight of the Ministry of Energy and Mines). More specifically, depicted as an all-powerful political tsar (Baker, 2016), he was the owner of the energy company PT Toba Sejahtra that holds significant assets in the coal mining business. He is also the uncle of the executive director of the coal mining association [si13]. Similarly, Bumi Resources, one of Indonesia's largest coal mining companies (Lucarelli 2010), is majority owned by Aburizal Bakrie, one of Indonesia's most politically influential figures, a Minister during former President Yudhoyono's administration and chairman of the Golkar party (Jotzo 2012).

Members of Indonesia's Parliament, particularly Commission VII, which is responsible for energy policy, reportedly own coal mining assets and thus have vested interests in coal mining [sn7, pn3]. Jokowi has not risen through traditional[5] power structures. He is depicted as being close to established powerful players with vested interests in order to secure his political power (Power 2016; Warburton 2017a; Baker 2016; Mietzner 2015; Bland 2019). During the 2014 election, Jokowi received financial and political support from Rini Soemarno, Minister of State Owned Enterprises, Luhut Pandjaitan, Minister of the Coordinating Ministry for Maritime Affairs, as well as Amran Sulaiman, Minister of Agriculture (Power 2016). As noted by Warburton (2017a), the president placed key enablers and financiers at the country's most lucrative sectors. Vested interests and corruption are widespread and widely known to Indonesia's public: Indonesia's anti-corruption commission "KPK" has actively investigated several cases of corruption in the energy sector (Reuters 2015, 2009; Mongabay News 2017). Most recently, Sofyan Basir, PLN's managing director, was at the center of attention of a corruption case involving businessmen and members of the Parliament (National Kompas 2018). Vested interests of political functionaries, as well as corruption cases, have also been picked up by popular media (e.g. Laksono und Supart 2019).

Regional development

In the context of decentralization, in which provincial or district governments have distinctive rights to provide coal mining permits and evaluate environmental impact assessments, the coal mining industry is highly influential. The coal mining industry was reported to be the main financier of electoral candidates in East Kalimantan, thereby guaranteeing political support [sn10, sn11]. In the context of fiscal decentralization, a mutual dependence exists at the local level, as provincial and district governments profit from coal-related public revenue collection, while coal miners seek favorable conditions to operate.

Over 4000 mining permits issued by local government entities were subject to revision and have already been partly revoked, which prominently exemplifies the repercussion of misaligned incentives at the local level (Reuters 2015, 2009; Mongabay News 2017). Law No. 04/2009 on Minerals and Coal Mining initially stipulated that district governments have the authority to issue mining permits. However, responsibility for the issuance of permits was revoked at the district level in light of the issuance of foul mining permits and returned to the provincial and national levels (Anderson et al. 2016).

Climate and environmental protection

The existing national energy plan can be regarded to be aligned with the ambition to reduce emissions in the energy sector by 19% below BaU by 2030 (or 315 $MtCO_2eq$) by means of RE targets and higher efficiency coal-fired power plants. The national energy plan regards domestic energy resources as national development capital. It therefore frames this energy mix target in the context of achieving energy independence and creating added value in the country, thereby strongly relying on domestic coal resources to expand the power sector. This is reflected in the NDC's BaU scenario, which assumes a future expansion exclusively based on coal.

With regard to the lack of support for RE power generation and nearly no uptake of RE power plants up to date, interviewees have regarded the existing RE target as being rather symbolic [si2, sn3, sn9, si13]. As a means to achieve the target, feed-in-tariffs were introduced under Energy Minister Sudirman Said in 2016 [si2], yet abolished in 2017, after the Ministry was taken over by Minister Ignasius Jonan [si2, sn3]. Constantly changing regulations are regarded as the most challenging factor preventing IPPs from participating in the RE sector [ei2, si12].

In 2015, the Ministry of Environment and the Ministry of Forestry were merged into the Ministry of Environment and Forestry (MOEF), and a Directorate General of Climate Change Mitigation was established (van Tilburg et al. 2016). However, a senior representative of the same Ministry [pn2] reported that MOEF has virtually no influence in energy policy, as they do not belong to the overseeing ministries of PLN. Numerous stakeholders underlined the lack of relevance of MOEF in energy policy formulation. As forest and peat fires due to land clearing for oil palm plantations have released massive GHG emissions in the past (see Figure A15.2), climate change mitigation has historically been regarded as a domain of forestry and agricultural management. This is also reflected in Indonesia's NDC, in which the largest share of total mitigation is projected to be achieved in forestry. The fact that government reports project strong growth of energy sector emissions (e.g. MOF 2009) suggests that Indonesian policymakers are well aware that coal-fired power plants will be the biggest source of GHG emissions in the near future. Nevertheless, climate protection is narrowly framed by Indonesia's government as a forestry issue [sn1, sn3, pn2]. Representatives of key ministries, including the MEMR, MOF and MOEF, have confirmed that the energy sector currently is not regarded as central for climate change mitigation [sn1, pn1, pn2, epun3, si13, epun4] (MOEF 2016).

International development agencies and NGOs are active in the field of climate protection in the energy sector, particularly by supporting the development of RE. However, they are considered to have a negligible influence in Indonesia's energy policy [si2, si3, sn3, si6, si8, si11, sn6, sn7]. A growing civil society movement and NGO network that criticizes coal mining and the construction of new coal power plants have emerged over recent years and contributed to changing public attitudes, as well as to the evaluation and revoking of mining permits (Fünfgeld 2019).

There is little awareness of coal-induced local pollution-related risks and the adverse effects of climate change within the broader population [si5, si9, si13]. Coal mining sites often do not comply with environmental and safety regulations, due to the combination of a highly influential coal mining industry and local governments subject to a low degree of law enforcement, corruption and money politics [sn10, pn6, sn11] (Fünfgeld 2016). Strong protests against coal-fired power plants have been observed in other Southeast Asian countries, most prominently Thailand (IEA 2018). In Indonesia, civil society's opposition to the proximity of coal mining sites and coal-fired power plants has not widely resonated in media and politics [si5]. With low political pressure and virtually no popularity losses expected by leaving this policy domain unaddressed, politicians have little incentive to foster a sustainable development path [si9].

Discussion and conclusion

We identify the provision of public infrastructure as the overarching goal of the Indonesian government, which leads to the expansion of power plants in the energy sector. To achieve this objective, energy subsidies were reduced and financial resources were redirected to infrastructure investments. The contribution of coal mining to value-added creation and its royalties to the public budget create a strong incentive for the national and local governments to sustain the profitability of the coal industry. As a consequence, all three ministries governing energy policy (MEMR, MSOE and MOF) have incentives to support the extraction and use of coal (Figure 15.2). The MSOE, as shareholder of Indonesian SOEs, executes the presidential agenda, delivering public infrastructure through SOEs. As shareholder of PLN, the MSOE aims to improve the financial performance of the loss-making utility by minimizing its costs. The MEMR, officially regulating PLN, has prevented tariff increases due to popularity concerns in light of national elections. Reducing system costs by favoring coal remains the most practicable option for PLN. The MOF, in charge of Indonesia's public budget, has an incentive to secure the collection of royalties from coal as a source of public revenues. Similar incentives at the subnational level result in resource-rich provinces, such as East Kalimantan and South Sumatra, developing coal mining as a key economic activity and source

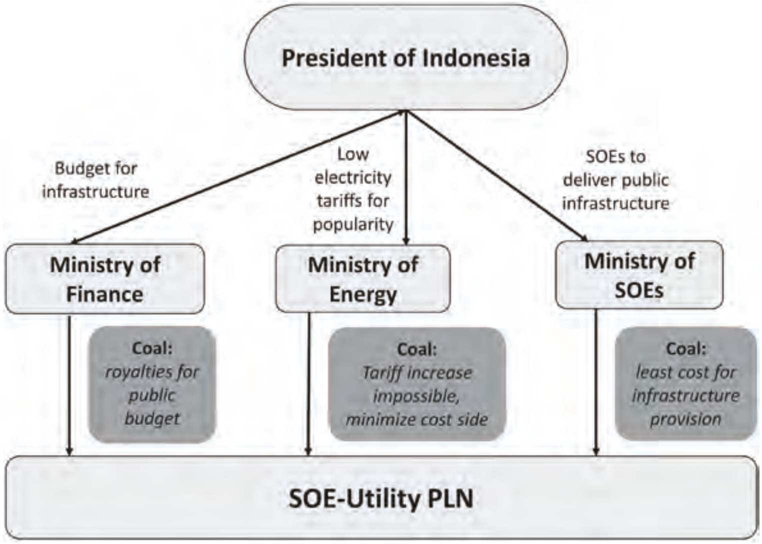

Figure 15.2 Schematic overview of actors and incentives leading to coal development.
Source: Own elaboration.

of public finance. Lack of law enforcement capabilities at the local level and corruption further aggravate this political bias.

Oligarchic structures and blurry lines between the political and the economic elite related to coal and natural resources are widespread in Indonesia. Vast reserves of coal in the country, a narrative of resource nationalism, the paradigm of energy resources as development capital, and the government's focus on infrastructure provision are supportive conditions for the coal lobby's interest to resonate in energy policy. Therefore, it is no big surprise that environmental and climate protection are often framed narrowly as a forestry issue, despite the government's documented awareness of the adverse effect of promoting coal on GHG emission reductions. Hence, the BaU scenario in Indonesia's NDC largely reflects Indonesia's national strategy to foster coal, which is highly detrimental to efforts to achieve global carbon neutrality by the mid of the century.

In Indonesia, there is limited public awareness of the substantial externalities that accompany coal use, both with regard to climate change and also in terms of local pollution and health. In terms of local pollution and heath, civil society opposition to coal mining sites and coal-fired power plants has had a limited resonance in media and politics and thus does not provide substantial opposition to the development and use of coal. Acknowledging the adverse effects of coal use and empowering affected communities could provide additional political momentum to shift away from coal toward cleaner energy sources.

The reliance on coal impedes a discussion on how a (just) transition away from fossil fuels can be achieved. To date, coal use is seen as a way to reduce poverty, promote industrialization, create domestic value added and develop regions, which otherwise would lack economic perspectives. In contrast to other countries, such as India or South Africa (Montrone et al. 2021; Strambo et al. 2019), in Indonesia, employment in the coal sector (or fear of job losses) plays a minor role in promoting coal and was barely mentioned in our interviews. Also, energy-intensive industries (e.g. such as steel, cement or chemical industries) other than extractive industries were not referred to by interviewers as influential actors of energy policy.

Arguably, the institutional change required to govern Indonesia's energy sector in a sustainable way (e.g. incorporating the Ministry of Forestry and Environment with the ministries overseeing PLN, reforming PLN to reduce its propensity to political capture) cannot be brought about in isolation. Rather, reforms to prevent continued lock-in to coal-fired capacities will only be successfully implemented as part of a broad-based effort to curb corruption and increase the institutional capacity of regulating bodies overseeing Indonesia's energy policy and its power sector.

As the political elites derive sizeable rents from coal use, climate change mitigation measures can be expected to face severe political resistance. As PLN may be unable to raise electricity prices, climate policy that potentially increases electricity prices could also face substantial resistance from PLN. Likewise, the ministries overseeing PLN might as well oppose climate measures. Carbon pricing could constitute an entry point for more ambitious climate change mitigation. The MOF might support such a policy, which could provide sufficient revenues to compensate for the loss of coal royalties. Redirecting revenues from carbon pricing to regions that are heavily reliant on coal mining could also help to support structural change and provide a perspective for regional economic development.

Steadily declining costs of RE technologies could further change the government's perspective on how to satisfy the goals of delivering infrastructure, cheap electricity for the population and industry, as well as climate and environmental protection. Enabling access to cheaper finance and implementing attractive support schemes remain pivotal in the move away from coal, especially in view of the reported high financing costs for RE projects in Indonesia. Support schemes, such as feed-in-tariffs or financing schemes, could address this problem and allow energy companies that are either already diversified or willing to diversify their technological portfolio, to create a business case for renewable energies. However, this would also reduce the coal-related rents of politically influential actors, which might oppose reforms. To ensure their buy-in, some form of compensation might be necessary.

The successful implementation of climate mitigation policies in the energy sector will hence depend on the extent to which concrete policies harm coal incumbents in the private and public sector, as well as the effectiveness of efforts to diminish the influence of the coal lobby on energy policy.

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Appendix

This chapter contains supplementary online material at https://www.mcc-berlin.net/pecoal/ch15.

Notes

1 This chapter draws on the article Ordonez et al. (2021). We gratefully acknowledge permission to reproduce parts of the content from Elsevier.
2 The online appendix contains an overview of energy and climate policies.
3 According to MEMR Reg. No 35/2014, similar reductions were stipulated in the minerals and coal mining sector, and permits were reduced from 117 to 6 (MEMR Reg. No. 34/2017).
4 In 2001, the country went through a large-scale decentralization process. The country was divided into a total of 82,330 local government entities, 34 provinces, 99 cities, 410 regencies, 6,543 districts and 75,244 villages (IEA 2015). Local governments acquired power in decision-making in areas such as raising revenue (e.g. royalties and land taxes), issuance of mining permits and assessment and regulation of environmental impacts.
5 In Indonesia represented by the military, political families, bureaucracy or mass religious organizations (Mietzner 2015).

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16 The political economy of energy and climate policy in South Africa

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Introduction

The South African coal sector has had a significant impact on South Africa's socio-economic landscape. Interest groups favoring coal have been influential in policy-making processes, especially due to coal's dominant role within the energy sector. As the energy sector is responsible for 80% of South Africa's greenhouse gas (GHG) emissions (NPC 2018), a transition away from coal is the key for the country to achieve its Nationally Determined Contributions (NDCs) in line with the ratified Paris Agreement, its domestic policy targets and national development goals, and to reduce negative externalities from coal mining and coal power plants such as pollution and negative health effects (Nkambule and Blignaut 2017).

In 2019, coal accounted for about 75% of total primary energy supply and 88% of South Africa's electricity generation (Enerdata 2020). It has been a critical part of South Africa's economy for decades and provides domestic inputs for electricity generation (Eskom 2020a). Coal mining contributes 2.3% to South Africa's GDP with about 40%–45% of the sales income attributable to the export market, namely to India, Pakistan and Southeast Asia (Strambo et al. 2019; Chamber of Mines 2018; IEEFA 2019).

Currently, the prospects of the coal export markets are deteriorating and South Africa is struggling to meet electricity demand with an aging fleet of coal power plants (IEEFA 2019). As costs of renewable energy sources (RES) are decreasing, the sector is expected to further shrink in the years to come (Burton et al. 2018a; IEA 2019; 2020b; Oyewo et al. 2019). Meanwhile, due to high RES potential and a changing policy landscape, a steady increase of Independent Power Producers (IPPs) – mainly active in the RES sector – can be observed (DMRE 2020a; 2020b). With an expected increase in energy demand but a gap in power capacity, the diversification of the energy sector to ensure security of supply has become a primary target on the side of politics and business alike (Eskom 2020b; DMRE 2019; Ndlovu and Inglesi-Lotz 2019). Yet moving away from coal creates challenging issues for the country and the Mpumalanga province in particular. Considering the country's high unemployment rate of over 40% and the vast inequality represented by a Gini coefficient of 0.63, now

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exacerbated by the Covid-19 pandemic, the concept of a just transition that acknowledges socio-economic and environmental aspects is regarded as a crucial component for a successful low-carbon transition, including coal phase-out (World Bank 2019; Wright and Calitz 2020b).

The dependency on coal and the multitude of socio-economic challenges have increased focus on the political economy of coal and energy in South Africa. Previous literature identifies several political and economic drivers as the most relevant for the continued dominance of coal. One of these drivers is the "minerals-energy complex", consisting of the mining and energy sectors and related sub-sectors of manufacturing that use their influence for continued mineral profits (Baker et al. 2014, 2015; Trollip 2020). Incumbent actors, like the vertically integrated state-owned utility Eskom, which provides more than 90% of the national electricity supply, try for many years to maintain a regime-favorable environment through resisting change and creating inertia (Ting and Byrne 2020), as have other large emitters. Consequently, Caprotti et al. (2020) describe South Africa's energy policy and practice landscape as highly complex and dynamic while simultaneously being rigid, inefficient and nontransparent, partly a result of path dependency in apartheid-era institutions and policy (Marquard 2006; Steyn 2001). Nevertheless, changes in regulation and legislation are slowly creating a more RES-favorable policy environment (GreenCape 2020), while a financial crisis at Eskom and shareholder pressure to divest from coal mining and large emitters are causing incumbents to explore pathways away from coal.

Modeling approaches by Oyewo et al. (2019), Hanto et al. (2021), Arndt et al. (2019) and Wright and Calitz (2020a) show that, in any least cost scenarios in line with the 2°C global temperature target, no new coal capacities are being built. Moreover, much analysis projects an increased penetration of RES with more ambitious carbon constraints, especially wind and photovoltaics (PV) (McCall et al. 2019; Roff et al. 2020). This leads to a significant increase in employment, albeit much more decentralized jobs are compared to the current, highly concentrated employment in the coal sector.

This chapter provides a theory-guided analysis into the political economy of energy in South Africa to understand the driving societal and political forces behind the ongoing dominance of coal. The analysis is based on 20 in-depth semi-structured expert interviews[1] with 21 actors associated with the energy and mining sectors in South Africa, which were conducted between August 24, 2020, and December 20, 2020, via Zoom. The interviews were evaluated and coded in accordance with the political economy framework by Jakob et al. (2020) covered in Chapter 1, which assumes that energy and climate policies are the results of a complex interplay between actors with different objectives influenced by contextual factors. Interviews highlighted the diverse group of actors involved in the energy sector and revealed their objectives and means of pursuing their respective interests. The results are then used to examine the multitude of contextual factors influencing decision-making processes. The interview results have been complemented and verified by existing research literature, news articles and documents on policies and regulations issued by the government.

The following section outlines relevant background information regarding contextual factors and actors. The "Results" section presents the main objectives in the energy sector. The "Discussion" section discusses the findings and relevant policy implications. The "Conclusion" section concludes.

Energy context and relevant actors

South Africa's energy sector is still shaped by the country's apartheid history and postapartheid political, social and economic forces (Marquard 2006; Baker et al. 2014). Given South Africa's high coal endowment and historical development of the sector, the fuel was historically a source of cheap electricity for energy-intensive growth and in other industries (e.g. coal-to-liquid productions). Coal's key position in South Africa's political economy arose as a result of a combination of factors, including industrial policy oriented toward mining and minerals' beneficiation, strong support by the government through direct and indirect subsidies (Burton et al. 2018b) and national and international investors targeting coal (Baker et al. 2014). The government itself is deeply intertwined with coal interests, given that the state-owned utility Eskom owns most of South Africa's 40-GW coal power fleet, and coal mining has been a key sector for postapartheid economic redistribution, connecting political elites to mining interests. However, Eskom is now a national liability, and in a financial and an operational crisis, it requires ongoing state bailouts to repay otherwise unserviceable debt. In addition, 15 years of load shedding culminated in 2020 for 10% of the year (Wright and Calitz 2020c). Structural problems on Eskom's end, including cost and time overruns at new coal plants, tariffs that do not reflect underlying generation costs, as well as mismanagement and corruption have left the utility highly indebted and incapable of meeting electricity demand (DPE 2019). As coal is becoming increasingly uneconomical, international diversified miners have divested or de-merged their coal mining businesses and sold assets to local actors (e.g. Anglo American, South 32), while other large mining houses have announced limits on new investments in coal mining (Glencore, Exxaro) (Burton et al. 2018a; IEEFA 2019).

Despite these developments, competing interests that benefit from coal still support the maintenance and growth of the sector. This includes parts of government, who advocate for clean coal, a complex set of coal-related trade unions with sometimes contradictory views on maintaining coal vs creating new jobs, climate policy and just transition issues, and local coal mining companies, their owners and financiers. The national discussion focuses heavily on jobs and the risks to coal-dependent municipalities. Throughout the entire coal value chain, the sector currently employs about 120,000 people (0.7% of total national workforce), adding to the notion of coal being key to socio-economic development, especially in highly concentrated coal mining areas (e.g.

Mpumalanga Province), which has led to strong opposition to RES (Stat S.A. 2021; TIPS 2020).

On the other hand, the idea of a low-carbon transition and the uptake of RES is driven by a new group of actors consisting of pro-renewable parts of government, new investors, especially international IPPs, and civil society, including NGOs and think tanks. While generally a trend toward more RES-friendly policies can be observed, the regulatory environment is still seen as stiff and the slow progression in the implementation of policies and regulations, along with a government hiatus in RES procurement, has been causing uncertainty for investors (GreenCape 2020).

The energy sector in South Africa is predominantly regulated by the government through the Department of Mineral Resources and Energy (DMRE) as the policy and regulatory arm of the state are responsible for electricity generation and allocation of new capacity, as well as mining regulation. The Department of Public Enterprises (DPE) is responsible for Eskom, while the national electricity regulator of South Africa (NERSA) determines the tariffs and charges for Eskom. Additional state ministries shaping the context of energy- and coal-related decisions are the Department of Trade, Industry and Competition (DTIC), which oversees the energy sector from a localization and industrial development perspective, and the Department of Forestry, Fisheries and the Environment (DFFE), which is responsible for environmental concerns and preserving natural resources, including climate change policy (Climate Action Tracker 2020; GreenCape 2020).

Figure 16.1 gives an overview of relevant policies and plans between 2000 and 2020.

The National Development Plan (NDP), the draft Integrated Energy Plan (IEP) and the Renewable Energy White Paper lay the general foundation for a more equal and less carbon-intensive society through sustainable economic growth (National Planning Commission 2012; Department of Energy 2016; Department of Environmental Affairs 2011). The Integrated Resource Plan (IRP) 2019 is the national government's power plan from 2018 until 2030. It foresees a decrease in coal capacities from 38 GW to 33.3 GW and a substantial increase in PV from 1.6 GW to 8.2 GW, wind from 2.5 GW to 17.7 GW and distributed generation from 0.5 GW to 4 GW as well as the introduction of battery storage until 2030 (DMRE 2019).

While the IRP outlines how demand will be supplied, the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) plays a crucial role in procuring RES through its bidding process that has thus far procured more than 6 GW in four bidding windows. Furthermore, policy tools and laws like the carbon tax, offsetting schemes and the Climate Change Bill specifically target climate change mitigation (GreenCape 2020). However, the carbon tax was implemented in 2019 and set at a low rate, while other policies and regulations are falling behind their initial targets. As Eskom refused to sign power purchase agreements (PPAs), round 4 procurement from the REIPPPP

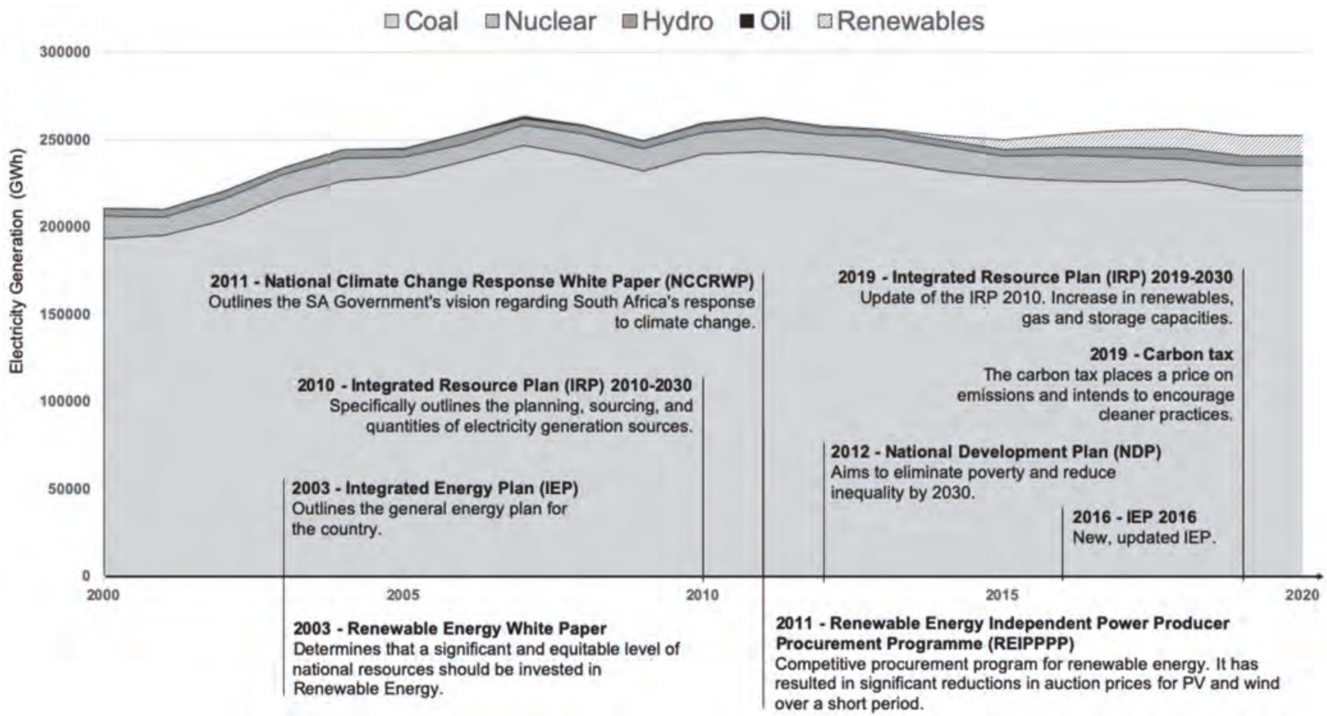

Figure 16.1 Overview of electricity generation (2000–2020) and relevant government decisions.
Source: Own illustration based on GreenCape (2020) and IEA (2020a).

was delayed for several years, although PPAs were signed in 2018. The fifth bid window was announced in April 2021. Furthermore, the Climate Change Bill is only expected to be finished in late 2021 (Climate Action Tracker 2020). As a result, the share of renewables in the last 20 years has merely increased from 0.14% to 4.7%, while coal remained the main electricity source with shares of 91.9% in 2000 and 87.6% in 2020 (see Figure 16.1).

Results

Through a qualitative analysis of the 20 interviews with 21 interviewees in conjunction with a literature review, the important actors, objectives and context factors for the South African energy and mining sectors were determined. The interviewees are categorized into political (p), societal (s) and business (b) actors. In total, five political actors, eight societal actors and eight business actors were interviewed. Following the method of qualitative content analysis by Mayring (2000), the identified objectives were coded content-wise and summarized into four overarching objectives with multiple correlating sub-objectives. Thereby, the number of mentions of an objective in the interviews was not taken into account. In addition, objectives and contextual factors included from the interviews do not necessarily reflect the opinion of the interviewees themselves but could reflect other actors mentioned during the conversation.

From the interviews, four main objectives influencing the national energy sector could be derived: "Energy availability", "Maintaining profitability of the coal sector", "Environmental and climate protection" and "Reducing inequality and employment insecurity". The remainder of this section presents and discusses the four main objectives and their underlying sub-objectives as well as the related actors and relevant contextual factors either favoring the role of coal or encouraging an energy transition toward RES.[2]

Energy availability

South Africa currently experiences a supply-side crisis with the worst year of load shedding on record in 2019 and electricity tariffs significantly increased over the last decade, resulting in negative effects on business and civil society alike (Goliger and McMillan 2018; Ateba et al. 2019).

Security of supply

To meet its short-term energy demand and set the foundation for long-term adequacy, immediate measures to ensure security of supply are seen as urgent [p1-p5, s1-s3, s5-s7, b1-b8]. Consequently, the DMRE has issued a 2000-MW Risk Mitigation IPP Procurement Programme (REIPPPP), with the objective to fill the current short-term supply gap and alleviate the current electricity supply constraints (DMRE 2020d). The program is expected to have a hybrid mix of RES and gas to reduce overall costs [p3]. To meet capacity demands, interviewees further underlined the urgency for a swift implementation of RES procurement through programs like the REIPPPP [p1, p5, s1, s2, s6, b8].

There is general consensus that solving the financial, structural and operational problems of the national electricity public utility Eskom is essential [p1, p2, p4, p5, s1, s2, s4-s8, b1-b8]. Eskom has a history of mismanagement and an underperforming coal power fleet. Its Energy Availability Factor (EAF) has been considerably lower (70%) than projected in the promulgated IRP 2010–2030 (86%), resulting in constrained capacity (DMRE 2019).

Considering the acute gap in capacity (an estimated shortfall of 4–6 GW for 2025) and the expected decommissioning of 12 GW in aging coal capacity until 2030, the diversification of the power sector is seen as a key lever to ensure security of supply and lower electricity costs while simultaneously reducing emissions through low-carbon power generation sources (Wright and Calitz 2020a). Gas is viewed as a potential transition fuel that would account for base-load power with significantly lower emissions [p5, s1, s7, b2-b5, b7]. However, an increase in gas could hinder the uptake of RES and cause an unwanted lock-in [p1, s1, s6]. Regarding nuclear energy, the government is looking into options for new small modular reactors (SMR) (DMRE 2019). Yet, there are no concrete plans due to their high investment costs and opposition from civil society [p1, s2, s6, b1, b2]. Regarding South Africa's future energy supply, interviewees also mentioned hydrogen as a technology with high commercial potential and as an element helping in the energy storage for intermittent electricity from RES [p2, p5, s1, s8, b1, b4-b6]. The expertise around Fischer-Tropsch-derived liquid fuels together with high potential for RES could position South Africa as a "leader" in the global hydrogen market. However, the technology is in an early stage and its commercial viability still has to be ascertained (Ayodele and Munda 2019).

Affordable electricity

Affordability of electricity is a key component to industrial and economic growth in South Africa, as higher electricity prices negatively affect households, business and especially energy-intensive users (Goliger and McMillan 2018; Khobai et al. 2017).

Interviewees pointed out that Eskom's high debt needs to be addressed as it inhibits the utility from investing in new ventures and translates into rising electricity prices, which is not seen as socially sustainable [p1, p4, p5, s1, s2, s7, s8, b2, b5, b7]. To keep Eskom afloat, electricity prices have significantly been increased from an average USD 0.027 before 2008 to USD 0.09 per kilowatt-hour (kWh) in 2019 and they are expected to further increase from 2020 onward (Edkins et al. 2010; Businesstech 2019). In an attempt to make the energy market competitive again and increase transparency and accountability [b3], the "unbundling" of Eskom into three business units, generation, transmission and distribution, was announced by President Ramaphosa in 2019 (South African Government 2019). However, there is reluctance toward the unbundling of Eskom as it might give too much power to the private sector and lead to greater concentration of ownership and higher prices for electricity users [s1].

Additionally, the diversification of the energy sector, as mentioned in the "Security of supply" section, is critical. Due to South Africa's high renewable energy potential and falling levelized costs of electricity for PV and wind, RES have become a cost-effective, low-emission alternative (Jain and Jain 2017; GreenCape 2020).

Electricity access

Following a nationwide electrification program, the electrification rate in South Africa is above 90% since 2018 (Essex and de Groot 2019). However, connecting the remaining, mostly remote or informal communities to the grid or utilizing embedded generation remains a technological and political challenge that needs to be addressed [p2, p4, s3, s7, s8, b7], in part due to perceived risks for Eskom and municipal distribution and for low-income users.

The concept of self-generation has gained momentum in South Africa as companies and private households alike have an interest in procuring their own power to reduce dependence on Eskom [p1, p2, p4, s3, s6, b1-b3, b5, b6]. The government only recently started to see and support self-generation as a possibility to alleviate pressure on the grid and the supply side (DMRE 2020c).

Maintaining profitability of the coal sector

The profitability of coal is a key factor for its dominance and the incentive to sustain its significance within the South African economy and energy sector [p1-p5, s1-s8, b1-b8]. Coal-revenue-related interest groups are seen to influence political decisions in their favor. This is further reinforced by the narrative of coal as a major contributor to economic growth, industrialization and the provider of national employment throughout its value chain [p1-p5, s1-s8, b1-b8].

Revenue from coal

Coal-related revenues finance actors on different levels throughout its value chain and make vital contributions to the fiscal situation of administrative bodies through royalties and taxes, especially in coal regions [p1, p2, p4, s1, s3, s6-8, b1, b3, b4]. Major corporations and a lobby with strong political influence are associated with the coal sector in South Africa [p1, p5, s1, s2, s6-s8, b1, b3, b4, b7].

South Africa exports about 30% of its domestic coal production by volume, which makes coal one of the largest, albeit falling contributor to overall revenues in the sector, and an important asset to acquire foreign currencies. Export coal profits are highly dependent on global commodity markets and exchange rates and even large miners have seen falling EBITDA from coal in recent years.

Future coal demand on the international markets is generally expected to decline. A decline in exports would lead to lower revenues for the coal sector and increase the risk of stranded assets (Strambo et al. 2019; Chamber of Mines 2018; IEEFA 2019).

Such developments motivate current restructuring efforts of local economic actors that have been focusing on coal [s7, s8, b4, b7] and recent activities of transnational coal mining companies, de-merging the coal assets (e.g. Anglo) or selling their South African coal assets (e.g. South 32) (Burton et al. 2018b; IEEFA 2019). The assets are bought by South African companies, often unlisted (e.g. Seriti). In some cases, the viability of these transactions will rely on renegotiated Eskom coal supply agreements and strong exports, while civil society flags issues with the long-term sustainability to spin off assets and the ability to manage rehabilitation and social closure.

Exxaro, another coal major, has, like Glencore, indicated they will not invest in further coal and pivot into new sectors in the long term.

Rent-seeking and vested interests

Rent extraction from coal-related activities by actors with political and societal influence was mentioned to account for the sector's continued dominant position within the country [p1, s1, s2, s4, s6, b1].

Interviewees indicated the existence of strong links between stakeholders associated with the coal sector and political actors. The former include companies and official lobby groups representing coal sector interests, trade unions related to coal sector employment and individuals with private ties promoting financial and other vested interests [p1, p2, s1–s4, s6, s7, b1, b3–b5, b8]. Ties exist between the long-term ruling party, the African National Congress (ANC) political elites and coal mining and use, including family ties to companies belonging to, for example, former ministers of Energy and the President, investment holding companies with stakes in the coal sector, including ANC-aligned investment companies and the ANC's Chancellor House, and "state capture" by corrupt interests of ANC politicians (Eberhard and Godinho 2018). The long-standing "Tripartite Alliance" between the South African Communist Party (SACP), the Congress of South African Trade Unions (COSATU) and the ANC exemplifies the institutionalization of such connections. Actors connected to the mining and coal sectors have been holding various positions in one or more of the alliance's member parties whereby pro-coal union leaders have been playing important roles in political institutions (Ting and Byrne 2020). Such leadership constellations sometimes promote coal-favoring policies and regulations, among others motivated by vested interests [s1, s2, s4–6, b1].

Furthermore, sociopolitical ties of decision makers and connected underhand personal interests were mentioned as reasons for the past mismanagement and lock-in of coal within Eskom's portfolio for energy generation [s1, s6, b1, b8]. A new "elite" class has been seen using Black Economic Empowerment (BEE) mechanisms, officially meant to contribute to the expansion of economic participation of historically disadvantaged individuals, to promote their own vested interests in the coal sector [s4, s6, b3].

Employment and regional development

The coal sector has been the pillar of South Africa's energy security in the past decades, providing a local fossil fuel as the primary national source of energy and comparably well-paid employment for lower skill levels. Coal has been the key in the economy's development, not only in the mining sector but also playing a part in broader industrialization (Mathu and Chinomona 2013). However, the standing of the coal sector as a contributor to the national energy security and job market was mentioned as likely to change in the future regarding expected long-term tendencies of an overall coal phase-out [p1, p4, s1, s3, b8]. To foster societal opposition against a national coal phase-out, actors profiting from the sector, including unions, have been seen to promote partly inaccurate narratives about alleged socio-economic costs of this process, especially employment loss [p1, s1, s4, b2, b3, b7, b8]. On the other hand, unions were the progenitors of just transition in climate policy and actively sought to understand the risks and opportunities for workers and promote renewable energy, that is state-owned or socially owned. Overall, organized labor does not act or promote positions homogeneously, even within the same unions or federations. Without active implementation of a just transition, their concerns about job losses and "being left behind" are not without merit [s1, s3, b5, b7].

Environmental and climate protection

South Africa is the world's 14th largest emitter of GHGs (IEA 2020a). There is consensus about the urgent need for a low-carbon transition and a reduction in fossil fuel use and coal mining to mitigate negative environmental, socio-economic and associated harmful consequences for human health [p1-p5, s1-s8, b1-b8].

Climate change mitigation

With the current global movement to fight climate change, an increasing number of actors in South Africa also commit to taking mitigating actions [p4, s1, s2, s5, s7, b4]. The country has pledged to peak its GHG emissions by 2025, plateau them for a decade, before an absolute decline. The aim to reach net zero by 2050 was also included in its Low-Emission Development Strategy (LEDS) (UNFCCC 2015; 2020). However, coal-related actors argue that climate change mitigation will lead to job losses and fear that exacerbated environmental and climate legislation might constitute disproportionate economic burdens on businesses and customers. Thus, they call for sensible alignment, implementation and offsetting mechanisms [p1-p4, b3, b4, b5, b8]. Nonetheless, some powerful actors such as Sasol are planning to take measures to reduce their emissions [b4-b7].

South Africa's National Climate Change Bill aims for the country to transition toward a lower carbon economy and a climate-resilient society. This is also important to attract international companies, since most of them pay attention to their carbon footprint. Additionally, regulatory instruments like the carbon tax, pollution abatement requirements and the carbon budgets system are supposed to cut GHG emissions and increase pressure on carbon emitters but are currently regarded as ineffective and nonbinding [p3, p4, s1, b4, b5]. The carbon tax in its initial phase (2019–2022) only applies to direct emissions and sets total tax-free allowances as high as 95%. As a result, actors from the government in support of climate change mitigation, NGOs and researchers are calling for more ambitious targets within legislation, which address RES procurement and climate change mitigation (e.g. IRP 2019 and second phase [2023–2030] of the carbon tax) [p1, p4, p5, s1, s3, s5-s8, b4-b6, b8].

Actors from the coal sector are seen to stress alleged possibilities of "clean coal" and carbon capture and storage (CCS) technologies to mitigate the sector's GHG emissions [p2, s1, b3, b5]. However, these technologies are still not economically viable and are seen as a strategy from the coal sector to create inertia (Viebahn et al. 2015).

Procurement of renewables

To reduce the country's carbon footprint, higher penetration of RES and a regulatory environment favoring their uptake are needed. As Eskom's financial situation prevents internal investments into RES expansions, IPPs and the REIPPPP play an important role in addressing the current capacity gap [p1-p5, s1-s3, s6-s8, b1-b8].

Despite recent changes in legislation to allow for an easier procurement of RES for private investors and municipalities, the procurement process is still seen as "too prescriptive" and "disincentivising" (DMRE 2020c). In a context in which the buildup of new capacities is urgently needed, this hurdle points out the lack of policy certainty in the energy sector [p2, p3, p5, s7, b2-b6, b8]. Moreover, criteria for investors should be aligned with tariffs and consistent with regulatory frameworks to allow the entry of new investors [p2, b3, b5-b7].

Another way to increase investments in large-scale RES is the idea of international concessionary finance based on accelerated retirement of coal-fired power plants, which is expected to simultaneously tackle Eskom's debt issues and reduce the carbon footprint with the support of international funders [s1, s2, s7, s8].

Reducing negative effects from coal

The continuous use of coal and fossil fuels has led to negative effects on health due to direct or indirect exposure, such as cancer, respiratory and cardiovascular problems, and negative environmental and socio-economic effects, such as polluted air, soil and water. Coal mining further increases the risk of water scarcity, a problem expected to worsen in the years to come (Olufemi et al. 2018).

Civil society, despite its limited means, plays an important role in challenging the status quo. Strong activism from communities and civil society organizations, backed by legal action, has challenged pollution issues stemming from mining, coal-fired power stations and refineries [p1, s2, b6]. Campaigns by multiple organizations (e.g. Earthlife Africa, groundWork) successfully challenged new coal plants (e.g. Thabametsi) on the grounds of their potential harm to the environment and human health. Also, new coal mines were stopped on the grounds of their expected detrimental effects on the environment, climate and society (e.g. Mabola Protected Environment in Mpumalanga Province) (Humby 2018; Reuters 2019).

Reducing inequality and employment insecurity

The triple challenges of poverty, inequality and unemployment are relevant when assessing the implications of a low-carbon transition in South Africa [p1-p4, s1, s6-s8, b1-b8]. Especially the consequences for affected communities and workers must be addressed (Winkler et al. 2020). The idea of a just transition has been embedded in climate policy since 2011, as well as in the country's NDCs. It ought to function as a framework to prevent and balance out the loss of employment connected to the coal sector, create local ownership and include all relevant actors [p1, p2, p4, p5, s1-s4, s6-s8, b1-b8].

Creating employment alternatives

A low-carbon transition entails a reduction in employment in the coal value chain, although the timing of closures and the age, skills and health of workers will be important factors. Considering the already high national unemployment, it is vital to diversify economies and create employment opportunities in affected regions, especially in the Mpumalanga province, where 80% of coal extraction is concentrated (Spencer et al. 2018; TIPS 2020). An unplanned, opaque and hasty exit from coal might lead to severe negative socio-economic impacts in affected regions and therefore spark social unrest and increased opposition to a low-carbon transition [s2, s3, b5]. As such, the formation of local value chains connected to RES technologies is important to create new local employment opportunities. While general production costs could not compete internationally, some aspects of the production value chain for key components needed for RES, such as cable ties or module assembly, could be localized in South Africa [p5, s1, s4, b1, b2, b4]. Furthermore, the repurposing of old coal-fired power plants to natural gas or RES is an option to create employment in affected areas [b5, b7] and is being explored by Eskom's just energy transition project office.

While there is potential for employment in RES, lower salaries and benefits as well as spatial differences between new employment in RES and current employment in coal-mining areas are a problem. Additionally, reskilling is an issue as coal-related jobs are often low-skilled, making it challenging to find fitting jobs with equal pay [p1, p2, s3], partly because of very low wages across the broader economy (Burton et al. 2018a).

These factors play into the hands of pro-coal actors as they call for a slow transition process to cushion the effects of unemployment caused by a declining coal sector and ensure adequate considerations of socio-economic aspects, allowing the transition to be "just". However, regional policymakers already recognize the risks related to coal extraction and use, and the need for a just transition [s1, s3, b5, b7].

Ownership

The increase of RES through IPPs is generally perceived as beneficial for energy security [p1, p2, p4, s1, s6–s8, b3, b4, b6]. Since these are predominantly owned by foreign companies and private investors, some actors – especially unions – see the trend of privatization of the sector as problematic [s2, s3, s7, b1]. Through public ownership or ownership models, such as community-owned or socially owned capacities, the benefits of RES could go beyond the economic and environmental impacts and include socio-economic aspects of a just transition [p1, p2, p4, s1–s3, s7, b6, b7]. While increasing the number of community-owned energy systems is deemed beneficial, little-to-no communities have the financial capabilities to develop and use them. This situation is seen to highlight the need for new investment schemes [s2, s3, b1].

Though BEE regulations are seen by certain actors as being used to promote vested interests within the coal sector and hamper the expansion of emerging sectors crucial for a coal phase-out [s4, s6, b4, b6], BEE is seen as an essential social justice tool a just transition would have to embrace [s6, b1, b2, b4, b6].

Stakeholder engagement

In line with the concept of a just transition, the focus is increasingly on the involvement of all actors affected by the transition. Therefore, dialogue is initiated on a local, municipal, provincial and governmental level, internationally, and by major national companies like Sasol and Eskom setting up working groups [p1, p2, p4, p5, s1–s3, s6, s8, b1, b2, b4, b5, b7]. The newly created Presidential Coordinating Commission on Climate Change (PCCCC) is regarded as a first step to support the just transition to go about in a coordinated, comprehensive and strategic manner through high-level government leadership (DEFF 2020).

Discussion

The analysis of the interviews shows that the South African energy sector is currently in an intricate state of high dependency on coal backed by powerful actors, on the one hand, and facing a growing demand for alternatives to an increasingly economically, environmentally and socially unviable system, on the other hand. Exacerbated by problems such as the inability to meet national energy demand and the high debt of the main electricity generator Eskom, efforts to transition toward a more diversified, low-carbon energy sector have manifested over the past years.

Nevertheless, the extraction of rents creates an incentive to maintain the current power structures and dependency on coal, resulting in resistance toward new government regulations, policies and the low-carbon transition. Thus, the coal sector is expected to continue constituting an important source of national- and community-level income and provide a significant amount of national employment throughout the near future.

While the government has taken steps to facilitate a competitive and investor-friendly regulatory environment for RES, there are still critical issues related to policy and regulatory certainty. Interviewees described the existing legislative body and state interventions as inconsistent. It is essential that laws and regulations are implemented by means of programs that are securely funded and well managed. To back the uptake of RES and diversification of the energy sector, a more coordinated political effort to allow the implementation of large-scale, small-scale and embedded generation through uncomplicated bureaucratic processes and financial incentives is needed.

Ecological fiscal policy tools like the carbon tax present promising first steps. They ought to be part of an effective overarching national strategy for GHG reduction that includes reasonable mechanisms to not disproportionately penalize affected actors but nudge them toward a low-carbon transition.

The issue of unemployment adds another layer of complexity to the discourse of a low-carbon transition in South Africa. To ensure support for a transition from a majority of societal stakeholders, including trade unions and actors in regions that have been relying on coal sector revenues, conscientious planning for finding alternatives to coal-related employment is crucial. Efforts to support the processes need to be intensified throughout several levels of society, business and government. Therefore, local value should be increased through apt ownership schemes and large-scale utility IPP projects ought to increase their focus on social impacts.

Conclusion

For this research, expert interviews with societal, political and business protagonists associated with the energy and mining sectors in South Africa were analyzed in accordance with the political economy framework by Jakob et al. (2020). Four main objectives influencing the national energy sector were identified: "Energy availability", "Maintaining profitability of the coal sector", "Environmental and climate protection" and "Reducing inequalities and employment insecurity".

The high endowment and dependence on coal, as well as pressing social issues, which are intensified by the Covid-19 pandemic, such as severe social inequality and high national unemployment rates, lead to a complex and multi-layered political and social situation. Climate change mitigation goals and solutions cannot exclusively be considered in the context of low carbon and energy efficiency. Rather, they are tied to broader socio-economic implications. Therefore, they need to be embedded into a just transition framework for South Africa.

Nonetheless, the transition is slowly progressing, given the pressing need for climate change mitigation action and the context of quickly sinking RES installation costs, currently to lower levels than those for coal power generation technologies. But it remains to be seen how quickly coal will be phased out. Further analysis of the complex interplay between different actors associated with the coal and energy sectors, respective objectives and surrounding contextual factors is needed to contest the status quo. A more comprehensive and detailed understanding of the political economy of coal in South Africa would help to effectively establish a transparent regulatory environment and advance a national vision of a socio-economically "just" low-carbon transition.

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Appendix

This chapter contains supplementary online material at https://www.mcc-berlin.net/pecoal/ch16.

Notes

1 See Appendix A.1 for the full list of interviewees and A.2 for the full questionnaire.
2 See Appendix A.3 for an overview of relevant objectives, actors and contextual factors identified by the interviewees.

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17 The political economy of coal

Lessons learnt from 15 country cases

Michael Jakob and Jan C. Steckel

Introduction

This integrated volume has analyzed the political economy of coal for a broad set of countries differing in multiple dimensions, including their levels of economic development, their political systems, their technological capabilities, their endowments with coal and their renewable energy potentials. For a broad classification, we have grouped countries into four categories, namely (i) countries phasing out coal, (ii) established coal users, (iii) countries phasing in coal and (iv) countries oriented toward coal exports.

In this synthesis chapter, we pull together the key insights that can be derived from the individual case studies. The fact that these studies were conducted on the basis of a unified analytical framework (see Chapter 1) allows us to carry out a comparative assessment. The country studies are organized along key objectives relevant for political and societal actors. In this regard, Figure 17.1 shows the share of studies in which a certain objective is discussed (not accounting for the relative importance of individual objectives), sorted by country groups. 'Security of supply' (73%), 'climate and other environment' (60%) as well as 'affordability' and 'support for regional industrial development' (both 53%) are relevant objectives in most countries. Some notable differences arise when comparing the relevance of objectives across various country clusters: countries that phase in coal seem to be especially concerned about affordable electricity prices. Maintaining revenues and industrial development are important factors for exporting countries, whereas employment is most relevant for established users. In countries that phase out coal, climate change mitigation seems to rank high on the agenda when it comes to coal investments, while it is of little importance for countries that currently phase in coal. Finally, private profits seem to be influential for all countries, most significantly for established users and to a lesser extent in those phasing out coal.

Those objectives are weighted differently by political and societal actors. Hence, objectives stated by policy makers and in official documents do not necessary reflect the actual underlying reason for the chosen energy policy design. For instance, official policies might state that coal is preferred as it constitutes a reliable and affordable source of energy, whereas in reality, the

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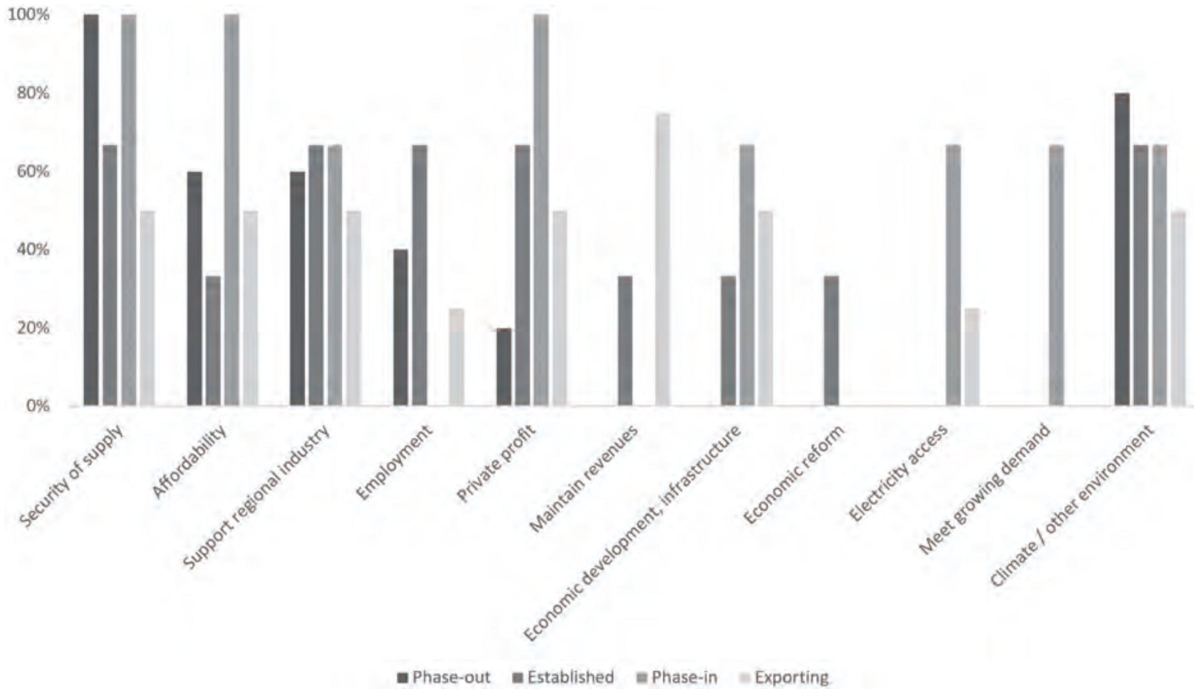

Figure 17.1 Key objectives as stated in case studies by country groups.

Note: Phase-out countries comprise Germany, Bulgaria, Chile, the United States and the United Kingdom; Established users comprise China, India and Turkey; Phase-in countries comprise Kenya, the Philippines and Vietnam; Exporting countries comprise Australia, Colombia, Indonesia and South Africa.

decision for coal is mainly driven by the influence of vested interests. We will discuss the mechanics of how stated objectives become relevant for the politics of coal in the 'Objectives (stated)' section for affordability of energy supply, energy security as well as climate change mitigation and local environmental concerns. The 'Vested interests: politics and incumbency' section will look into the important role of vested interests that promote coal production and use and how specific actors influence energy policy in their self-interest, often to the disadvantage of other actors and social objectives. In the 'Structural factors' section, we discuss how multilevel governance and the regulation of the power market influence how important political economy factors play out in the energy policy making of countries.

Finally, we conclude by linking these observations to individual country groups and discuss implications for the design of coal phase-out policies.

Objectives (stated)

This section discusses in detail how the objectives most frequently mentioned in stakeholder interviews and hence in individual case studies (affordability, security of supply as well as climate change mitigation and local environmental concerns) are important for the political economy of coal. *Affordability* is at the core of energy policy making in most countries. Yet, concerns about affordability can result in very different policy decisions, both supporting new coal investments and contributing to a fast phase-out, depending on the country context. The intermittency of renewables may indeed favor coal in countries with weak governance and difficulties to access capital. Nevertheless, several case studies included in this volume suggest that *energy security* might often be used as a pretext to favor vested interests. *Climate and other environmental concerns* dampen coal use only in a few high-income countries. However, with sufficient backing from civil society, the prospect of local pollution can affect energy policy formulation.

Affordability: capital costs and human resources

Providing affordable electricity is a key objective of energy policy in most countries. Cheap electricity prices are seen as a key means to ensure competitiveness of the domestic (energy-intensive) industry. In addition, the political leeway to increase prices for households is often very limited, particularly in low- and middle-income countries. Policy makers fear losing popularity, protests or even loss of power when increasing electricity prices. At the same time, prices are often too low to cover the energy system costs, leading to implicit subsidies to 'keep the lights on' (quote from the Vietnam case study), which often have substantial impacts on public budgets.

In low- and middle-income countries currently investing in coal, this leads to (financial) pressure to build the cheapest option. Despite falling costs of renewables, coal – at least in the short term – often is (or is seen as) the cheapest option to build new capacity. Against this background, short-term objectives, for example, to satisfy fast growing energy demand, are also weighted much higher than longer term objectives, for example, related to environmental protection. Various reasons can be identified in this regard:

First, most low- and middle-income countries face high capital costs. Weighted average costs of capital for energy investments were frequently stated to be above 10% (e.g., in Indonesia and Vietnam). Given very fundamental differences in the financing structure of renewables and coal, high capital costs favor coal, which is – on a per MW basis – less capital-intensive (Schmidt 2014). This bias might be exacerbated by regulations that favor coal over renewable alternatives and hence increase risk premiums and capital costs for renewable energies (RE). For instance, in Vietnam, coal-fired power plants receive long-term price guarantees, whereas RE producers need to rely on short-term contracts. Likewise, in the Philippines, utilities are shielded from the risk of rising world market prices for coal, as they are entitled to pass them on to consumers. Furthermore, coal is an established technology and policy makers are confident that they can handle an energy system built on coal. Additional capital (both human and physical) requirements for building an energy system based on renewables (including storage and managing intermittency) are regarded to be uncertain, more difficult to manage and arguably more costly.

Despite other factors relevant for explaining ongoing investments in coal, it also gets clear from the case studies presented in this book that coal is phased out (or not phased in) when it is not financially viable. For example, cheap natural gas has led to an unexpected decline of coal use in the United States that could not even be stopped by massive political support. A similar story could be told for the United Kingdom, where gas, cheap renewables and a carbon tax have made coal unattractive, leading to a fast phase-out of coal in the country. It is also interesting to watch out for future coal investments after the Covid-19 crisis. While in China the economic recovery seems to depend on significant new investments in additional coal capacity, many other countries have halted their investment plans. In some countries that had previously planned to increase their capacities, the tide for coal has turned. For example, in Vietnam, coal investments have been stopped in favor of alternatives (Manila Times 2021).

Energy security: security of supply and independence

In countries with abundant coal resources, energy security is frequently stated as an important objective that justifies scaling up coal-fired capacities. Energy security in this regard refers to multiple aspects, including import independence and reliable electricity supply. For instance, in Indonesia, coal is portrayed as an abundantly available domestic energy resource that can be tapped to decrease dependence on energy imports. Similar arguments have been brought forth in many countries, including Australia, Turkey and South Africa, as well as Colombia (which currently uses very little coal, despite being among the world's top exporting countries). Hence, in these countries, coal indeed advances energy security, as recoverable reserves are sufficient to meet domestic energy demand for decades, without having to rely on imports and being subject to fluctuations of world market prices.

It could be argued that alternative energy sources also perform well in terms of energy security, as renewable power is produced locally and is not exhaustible. Nevertheless, many low-income countries would still need to import energy technologies, such as solar panels and windmills. Even though this argument also holds for coal power plants, technological availability is secured by established providers that frequently offer favorable terms, in some cases related to declining domestic markets for coal-fired generation capacities and supported by the government. The activities of developers from China, Japan and South Korea in South-East Asia as well as the build-up of coal-based infrastructures in countries that are part of China's Belt and Road Initiative are good cases in point. Furthermore, dependence on coal imports seems unlikely to provide a serious concern, as global coal markets are well integrated with a large number of suppliers. Hence, importers are probably less affected by market power of supplying countries than it is the case for example, oil and gas.

For the reasons mentioned above, in coal-rich countries, the notion of coal as a domestic energy source that guarantees independence from energy imports does not seem to be grounded in economic reality. Rather, based on the evidence from the case studies, we presume that import independence might well be brought forth as a pretext to adopt policies that aim at ensuring employment in coal mining, profits for private actors as well as revenues for regions in which coal is produced and consumed.

However, one important dimension in which coal might indeed outperform renewables is reliability. In many countries, coal has been praised for the ability to produce baseload electricity. This is even the case in countries that need to import coal, such as Vietnam and the Philippines. Integrating intermittent renewables into the electricity system poses not only technical and financial, but also administrative as well as institutional challenges. Besides storage and back-up capacities, such as pumped hydro plants or natural gas turbines, governance frameworks, such as spot-markets, to ensure their sufficient provision will be required. This obstacle to RE deployment seems likely to be most important for countries with low institutional and regulatory quality, which can be expected to prefer coal as an energy source that is less demanding in terms of governance.

Climate and other environmental issues: emissions and externalities

In most countries, climate change mitigation and other environmental concerns, such as local air pollution, are important, but not central arguments in the energy policy discussion. For instance, many countries which are highly vulnerable to climate impacts, such as Vietnam or India, acknowledge the need to rapidly reduce global greenhouse gas emissions. Nevertheless, responsibility for emission reductions is frequently attributed to high-income countries, which account for the lion's share of historical greenhouse gas emissions and at the same time dispose of the financial means to shoulder the costs of clean energy generation. In addition, in countries in which deforestation has so far been the dominant driver of greenhouse gas emissions, energy policy is often misaligned with climate targets. For instance, in Indonesia, the ministry of the environment oversees climate policy but can mainly implement forestry measures, while energy policy is decided elsewhere.

Climate change mitigation is mostly a key concern in countries in which there is a high awareness of the dangers of unchecked global warming and a high willingness to avoid this. This can partly explain the ambitious coal phase-out instigated in the United Kingdom in connection with the country's national climate strategy as well as high costs of Germany's coal phase-out for the public budget. In a similar vein, climate considerations likely play an important role in emerging economies that are vulnerable to climate change and at the same time feature low costs to transition to clean energy sources. A good example is Chile, for which the domestic energy transition is a way to provide momentum for global efforts to reduce emissions.

Other environmental considerations, such as ambient air pollution or water use, seem to receive rather low attention in national energy plans unless there is outspoken resistance from civil society against specific projects. For instance, in Kenya, local opposition has mobilized to prevent the Lamu power plant due to the fear of impairing natural habitats and wildlife, which would also entail serious consequences for the local tourism industry. Likewise, in Vietnam, local communities opposed to air pollution have successfully blocked plans to erect coal plants. However, local environmental concerns may also hinder the adoption of RE, for example, in relation to land requirements for solar and wind.

Vested interests: politics and incumbency

Across all countries under study, it has become evident that the politics of coal is indeed a story of vested interests. Vested interests are often closely connected to regional actors and interests, independent of the governance structure. That is, regions (and regional actors) are found to play an important role in energy policy making independent of their constitutional role. Across countries, we identify four major ways in which actors influence energy policy in their self-interest, often to the disadvantage of other actors and social objectives, using arguments connected to (i) jobs, (ii) regional development, (iii) royalties, and (iv) lobbying and bribery.

Coal, in particular coal mining, is frequently connected to (locally concentrated) jobs. In many cases, those jobs are located in economically weak regions where alternative employment opportunities are scarce. While in most countries coal only accounts for an insignificant share of total employment on the national level, it can be very relevant for specific regions. For example, in the Eastern Indian regions of Jharkhand, Odisha, Chhattisgarh and West Bengal more than 10 million livelihoods are thought to depend directly or indirectly on coal-related activities. In some districts, more than 50% of the population derive their income from coal-related activities. This often leads regional policy makers to strongly make the case of keeping or even expanding coal. The argument is not only relevant for countries that export and/or phase in coal, but also in countries that phase out coal. In Germany, concerns about job losses have dominated phase-out discussions. The absolute number of about 20,000 direct coal jobs at stake seems rather moderate. Yet, a large share of these jobs is located in economically disadvantaged areas of eastern Germany with mounting discontent with the political system, such that phasing out coal has become a highly contentious issue. In a similar vein, in the United States the market-driven decline of the coal industry has contributed to populist sentiment in coal states.

Coal is also linked to regional development prospects (e.g., infrastructure provision) and industrialization in various dimensions. The widespread belief that coal holds positive spillovers on industrialization generates vested interests in favor of coal-fired power plants for regional governments in low- and middle-income countries, both regarding established users that continue to invest in new capacities as well as countries that phase in coal (Kalkuhl et al. 2019). Compared to alternative energy sources, such as natural gas or renewables, coal might have the advantage to contribute to the build-up of transport infrastructure, such as railways. These can bring down transport costs for other goods as well and thus spur regional development. While the link is established in the economic history literature (Fernihough and O'Rourke 2021), it is unclear whether similar effects still play a role today. The belief that coal holds positive spillovers on economic activity however seems to be strong in many countries under study.

In countries that mine and export coal, royalties are an important factor keeping coal in place. Mining regions frequently rely on royalties to meet societal goals, for example, carrying out investments to support the decentralization process in Indonesia or to alleviate the long-lasting internal conflict in Colombia. Such pronounced dependence on royalties creates strong opposition against phasing out coal mining. The prospect of shrinking export markets, for example, in the case of Indonesia or Colombia, incentivized regions to invest in new domestic coal-fired capacities to maintain a stable revenue flow from royalties. Securing revenues is hence a powerful driver of investments in domestic coal and hence stabilizing domestic demand in some countries.

Vested interests also manifest in the form of lobbying or bribery to ensure private profits. The coal industry is very often well connected to the top level of political decision makers. In this regard the coal industry is not only composed of mines and power plants but also includes the transport of coal or ashes, turbine manufacturers and landowners. Such stakeholders often exert political influence by providing political or financial support. In Indonesia, for example, the coal industry has been a major donor to the current president's election campaign. In Vietnam, regional policy makers that are responsible for siting power plants and anchoring them in the national power development plan have reportedly accepted bribes by coal plant developers. In India, local and national politicians have stakes in coal-related businesses, including machinery suppliers, transport or ash treatment. Oligarchs that own coal assets are also reported to be members of parliament (in Indonesia, India and the Philippines) or even in the government. In addition, revolving door policies that lead to an exchange of personnel as well as overlapping interests between regulators and regulated utilities can be found in many countries.

Structural factors

Across case studies, multilevel governance and the structure of energy markets seem to be decisive political economy factors for policy making. Sub-national jurisdictions may have incentives to implement policies that are not in line with national energy and climate plans, while supra-national policies can affect countries' energy systems without dedicated national policies. Regarding the structure of energy markets, state-owned utilities seem to be particularly vulnerable to special interests.

Multilevel governance: political networks and transnational regimes

Multilevel governance can have important implications in settings in which subnational jurisdictions have a major say in energy policy making. This is illustrated by the political support for coal mining by Indonesian regions aiming to create employment, spur local economic activity and boost their public budgets by means of royalties. Likewise, in China the construction of coal-fired power plants decided by regional administrations striving to meet their economic growth targets contravenes, at least to some extent, energy and climate policies formulated on the national level. In Germany, concerns voiced by a few coal-dependent regions are a major reason for the late phase-out date.

Promoting coal to boost regional economic activity is an important objective where it contributes to addressing long lasting conflicts, including violent ones. This is for instance the case for Indonesia, where jobs and public revenues from coal mining have played important roles in stifling demands for independence following the country's move towards decentralization after overcoming the dictatorship in 1997. In Colombia, revenues from coal are used to facilitate the peace process between the government and the FARC guerilla that has been lasting for decades.

An additional aspect of multilevel governance concerns the relationship between national and supra-national policies within the European Union (EU). In this context, the coal phase-outs in the United Kingdom and Germany need to be understood as being embedded in a broader European effort, in which developments in the power sector are to a large extent determined by the development of carbon prices in the EU Emission Trading System (EU

ETS). Nevertheless, both countries decided to apply additional instruments, most importantly the carbon price floor in the United Kingdom and the coal moratorium in 2038 in Germany, to hasten the transformation of the power sector. These efforts have probably not resulted in immediate EU-wide emission reductions due to the fact that the overall amount of available emission permits is determined by the EU ETS cap, such that emissions avoided in one country will lower carbon prices and result in higher emissions elsewhere (the so-called waterbed effect). However, phasing out coal opens the perspective of adopting more ambitious climate targets in the future, such as the decision to increase the reduction target for 2030 from 40% to 55% relative to the year 1990 with the EU Green Deal. For some countries, this will likely mean that coal will not be competitive in the power market anymore. That is, countries such as Bulgaria will need to deal with the prospect of a coal phase-out that is not deliberately implemented but results from policies adopted at the European level.

The international community can also be relevant for coal investments in various ways. First, China is not only an important role model for many newly industrializing countries; the country and its public institutions also actively engage in facilitating coal investments. Chinese companies offer turnkey solutions, including financial solutions and cost-competitive technology. In this regard, Chinese-made power plants are often significantly cheaper compared to technology developed in other countries. Chinese investors have also been reported to aggressively pursue new coal investments (e.g., by bribing local decision makers in Vietnam). The Chinese government's announcement to no longer invest in coal in other countries could hence play an important role for the prospect of transitioning away from coal in these countries. Second, most countries have a keen interest to boost their reputation and international standing. An important reason for South Africa to adopt a carbon price in the power sector despite its carbon-intensive energy system might have been the objective to act as a reliable partner in the international arena. Similarly, India announced ambitious renewable targets, partially to improve the international standing of its newly elected government. However, the impression given in official documents does not need to match developments on the ground. For instance, Vietnam had plans to massively ramp up coal power plants, despite the country's Green Growth Strategy, which probably was adopted mainly to make donors keep disbursing development assistance. Likewise, Colombia has frequently emphasized its role as a climate champion by highlighting the low level of domestic emissions, thus ignoring the adverse climate effects of its large-scale coal exports.

Structure of energy markets: competition and subsidization

The structure of energy markets seems to be a decisive factor determining which energy source is used to generate electricity. In the past, liberalized power markets had favored coal as the least cost option, at least in the absence of policies that take into account the social costs associated with greenhouse gas emissions and air pollution from coal combustion. This situation has changed in recent years, as renewable energy technologies and natural gas (often from shale gas) have become significantly less expensive. Hence, coal has quickly been replaced by cheaper alternatives in countries with a liberalized energy market, including the United States, the United Kingdom and Chile (most importantly by natural gas and renewable energy). Dedicated policies to either make coal economically less attractive or to support clean energy sources may speed up this process. With a carbon price from the EU ETS as well as generous feed-in-tariffs for RE, Germany features both elements. In this setting, coal might be driven out of the market well before the official phase-out date in 2038, despite the country's relatively low potential of low-cost RE. In countries with attractive RE potentials and liberalized energy markets, coal can only maintain its market share with targeted support from policy makers, as is the case in for example, Australia or Turkey. Nevertheless, such support is amenable to criticism and risks to be withdrawn in times in which budgetary discipline is required.

By contrast, in countries where energy markets are highly regulated (often including state-owned, vertically integrated utilities) vested interests resist coal phase-out. One may suspect that certain power market regulations are deliberately designed in ways that favor investments in coal. For example, in Vietnam independent power producers were guaranteed a fixed price over 20 years for coal, but only for one year for renewable energy. When this policy was reformed recently (i.e., after the case study for this book had been finalized), the country saw a massive uptake of renewable energy and increasingly discusses to forego the announced coal investments. In Turkey, electricity generated from lignite is provided a feed-in tariff. However, once there is sufficient political support for an energy transition, state-owned enterprises might even accelerate the transition away from coal.

While deregulating energy markets can be a means to curtail the influence of vested interests and pave the way for competitive alternatives, equalizing liberalized energy markets with no coal would be wrong. In the Philippines, privately owned conglomerates owning the generation, distribution and transmission infrastructure are found to favor new coal investments. If liberalized, energy markets hence also need to be protected from market power.

Outlook and conclusions

The stylized facts discussed in this chapter offer a number of key insights that could help to devise policies to facilitate coal phase-out. Arguably, these policies will need to take into account specific country circumstances. In the following, we discuss policy implications based on the broad classification scheme, summarized in Table 17.1.

First, affordability plays a key role especially for low-income countries, which are predominantly found among the group of phase-in countries and established users (and for some export-oriented countries for their domestic energy use). For these countries, adoption of low-carbon energy sources is only attractive if it does not come at higher costs than coal. The sharp price declines for renewable energy technologies could help to accelerate energy

Table 17.1 Overview of key aspects by country group as well as recommended policy options to support the phase-out of coal

	Phase-out	*Established*	*Phase-in*	*Export-oriented*
Affordability	Coal phase-out may be accelerated by market forces	Affordability main reason in favor of coal	Affordability main reason in favor of coal	Affordability reason to use and even increase coal use domestically
Energy security	Energy security not a major factor for coal	Energy security as a pretext to favor vested interests, some relation to grid stability	Energy security most relevant in terms of grid stability	Energy security as a pretext to favor vested interests, some relation to grid stability for some countries
Climate and other environmental issues	Important for at least some countries	Mostly important for immediate, direct impacts	Of lesser importance	Mostly important for immediate, direct impacts
Vested interests	Vested coal interests dominated by other actors	Strong vested coal interests	Vested coal interests not yet established	Strong vested coal interests
Multilevel governance*	EU	UNFCCC, BRI	BRI, International donors	BRI
Energy market structure	Mostly liberalized	State control favors vested coal interests	Mostly state controlled, high cost pressure	State control favors vested coal interests
Key policies for phase out	Carbon pricing, RE support, strengthen multilevel governance	Power market reform, institutional reforms, compensation schemes	De-risking RE investments, technical assistance to enable power grids with high RE shares	Institutional reforms, compensation schemes, support for alternative export opportunities

*: As the complexity of multilevel governance precludes general statements, we provide examples how such governance aspects are relevant for at least some countries in the respective category. In addition, sub-national issues are relevant for many countries, but highly context specific.

transitions in these countries. Nevertheless, issues related to high up-front capital costs and challenges to integrate renewables into existing grids loom large. In such situations, support from the international community, for example, with capacity building for the required regulatory environment and provision of de-risking instruments for clean energy investments, could play important roles. In most countries that have started to phase out coal, cost-competitive alternatives (including renewables and natural gas) can push coal out of the energy system even without further policy support.

Second, energy security in the sense of avoiding imports does not seem to be a major driver in favor of coal use. This is particularly true for countries phasing out coal, which are high-income countries with the technological and financial means to choose from a broad variety of energy technologies. As discussed, energy security is frequently used as a pretext to favor vested interests, which are most prominent among established users and export-oriented countries, which have abundant coal reserves. However, concerns related to the integration of renewables into existing grids are clearly relevant for countries with weak regulatory systems, which include established users, phase-in countries, as well as some export-oriented countries. In this regard, technical as well as financial assistance could be an important lever to facilitate coal phase-outs.

Third, climate and other environmental concerns are important factors for some countries that have decided to phase out coal. For all others, however, environmental concerns rank low on the political agenda, often dominated by economic concerns and the power of vested interests. In these cases, environmental considerations are likely most relevant for immediately observable direct impacts, such as local air pollution, in countries that are already heavy coal users. Provision of information regarding the social costs of coal use and strengthening civil society to effectively voice their concerns could then help to phase out coal.

Fourth, vested interests are most relevant in countries with a long-lasting legacy of coal production and use, that is, established coal users and export-oriented countries. In these settings, incumbents have accumulated substantial interests and political influence to prevent or at least delay the adoption of alternative energy sources even if these are less expensive than coal. Phasing out coal will require a combination of political reform to lower the influence of these vested interests on policy making and schemes to compensate political losers. By contrast, in countries belonging to the phase-in category, it seems politically much easier to embark on clean energy pathways if they meet central objectives, such as affordability and reliability, at least as well as coal. In countries that are on the way to phase out coal, that is, which also have existing vested interests, the balance of political power has already shifted. In these settings, coal use is being curtailed either deliberately by means of climate policy or by market forces that favor lower cost alternatives.

Fifth, multilevel governance issues are in one form or the other relevant for all countries. Due to the heterogeneity of this category, which includes sub-national, supra-national as well as international dimensions, it is least straightforward to relate to a certain country category. Instead, policies to phase out coal will need to be designed in a way that takes into account how national measures are implemented by sub-national entities and how they are embedded in a country's supra- and international commitments. Perhaps the most consistent conclusion that can be drawn in this regard is that countries might have an incentive to adopt climate measures to boost their international standing and derive ancillary benefits (e.g., participation in a regional trading block) even if climate change mitigation is not among their most prominent objectives.

Finally, liberalized energy markets favor the cheapest energy source. In the past, this has often been coal (at least in the absence of further environmental regulations). More recently, with cheaper low-carbon options becoming available, the tables have turned and renewable energies and natural gas have gained market shares at the expense of coal. In state-controlled markets, vested interests have a stronger influence. For this reason, state control is likely most important for established users and some export-oriented countries. Hence, supporting power market reform in these countries, that is, liberalization of the electricity market, privatization of state-owned utilities as well as unbundling of generation, transmission and distribution could provide an important impetus for clean energy transitions.

While arguably policy implications are country specific, we can provide some tentative policy recommendations, at least for specific country groups.

Countries that currently phase out coal in most cases have (cheap) alternatives available, which are more viable if power markets are liberalized. In countries with high awareness of climate change, dedicated policies, such as carbon pricing or support schemes for renewables, can further accelerate the energy transition. In this context, multilevel governance factors can play an important role to facilitate credible national plans to phase out coal.

For established users, and exporters with a significant domestic coal consumption, power market liberalization can help to keep the influence of vested coal interests in check. This is particularly true for countries in which low-cost alternatives are readily available. In addition, ways to address the political resistance of incumbent coal actors need to be identified. This might entail institutional reforms as well as forms of direct as well as indirect compensation that will reduce the adverse impacts of a coal phase-out on specific regions and industries.

For countries phasing in coal, economic costs are also a major concern. Even with high potentials for low-cost renewables, the required upfront investments in combination with high capital costs can make alternatives to coal unattractive. In this regard, the international community and donors could accelerate RE deployment by providing instruments for political as well as financial de-risking (Steckel and Jakob 2018). Furthermore, international cooperation could help to alleviate fears of grid instability by means of technical assistance and capacity building for the regulatory environment needed to be able to deal with a high share intermittent electricity.

Finally, for coal exporters, similar challenges of limiting the political influence of incumbents as for established coal users exist. However, potential solutions differ. One opportunity could consist in promoting efforts to shift economic models away from extractive industries. This might be most viable in countries in which new industries, such as the production of green hydrogen or energy-intensive industries based on cost-competitive renewable sources, can be established as alternative sources of income, employment and regional development.

To conclude, there exist numerous strategies that may facilitate coal phase-out. The key challenge consists in choosing those strategies that best address the underlying political economy that emerges from a particular constellation of actors, objectives and context factors. We hope that this integrated volume will contribute to gaining a clearer picture of the political economy factors that favor coal extraction and use and consequently help to design politically feasible phase-out policies that are adequate for the specific country context.

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