Jan Wiktor Tkaczyński / Łukasz Gacek

China's environmental policy in terms of European Union standards

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ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

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With 35 figures

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Bibliographic information published by the Deutsche Nationalbibliothek
The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data are available online: https://dnb.de.

This manuscript was completed thanks to the financial support of the National Science Centre (Narodowe Centrum Nauki) through research project 2016/23/B/HS5/00143 – *Can the EU's environmental standards and experience be applied in China's environmental policy-making process?*

Cover image: Shanghai, 2019. © Jan Wiktor Tkaczyński / Łukasz Gacek
Language editor and proofreading: Jan Rydzak

Vandenhoeck & Ruprecht Verlage | www.vandenhoeck-ruprecht-verlage.com

ISBN 978-3-7370-1211-9

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

To Professor Marek Świstak,
with many thanks for providing the support
without which this book would have been entirely different.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

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Introduction

Even a superficial review of current issues in international policy will easily reveal that environmental protection stands prominently among them. The dire state of the environment in some parts of the world has demonstrated that addressing environmental problems is no longer a purely internal matter for the countries concerned. On the contrary, it has become a point of confluence – however paradoxical it may sound – that unites disparate actors beyond political divisions or economic interests. After all, acid rain does not respect national borders, nor do emissions of harmful volatile substances. Pollution in rivers does not stop at national borders, nor do particles suspended in the air encounter invisible manmade barriers.

However, this self-evident truth is only one side of the ecological coin. The other, equally dramatic side is the depletion of natural resources, including energy resources. Without coal and lignite, oil and natural gas, the economy at its current stage of development is not able to function, much like agriculture cannot operate normally when faced with progressive soil degradation and groundwater pollution. Although climate change is nothing new in our planet's history, it is also giving rise to serious environmental problems that affect us all. The image of melting Arctic glaciers and the everyday reality of increasing average annual temperatures around the world are both evocative and tangible illustrations. The accelerating transformation of lands that undergo intensive farming into barren wastelands, the burning of the rainforests, and the extinction of plant and animal species are equally troubling.

The outcomes of these phenomena are undisputed facts. Their causes, on the other hand, remain more elusive. But regardless of the extent to which the changes observed on our planet are the result of human activity – and the extent to which they remain natural processes best explained by earth sciences ranging from geophysics and geology to geography and oceanography – there should be no doubt that humans, through our activity, have a significant impact on the state of the environment. This impact is most conspicuous when the activity in question bears the hallmarks of predatory exploitation, which can be readily

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identified and located in many parts of the world. The challenge facing humankind today is to reconcile the need for economic development that enables societal well-being and prosperity with the duty to provide the natural environment with the critical protection that it needs to maintain biodiversity and ensure the survival of species. In the long term, achieving a sustainable balance between these two objectives will be one of humanity's greatest missions.

This will not be an easy task. Just how difficult, expensive, and time-consuming it can be to fulfill is best exemplified by China. There is no better or more illustrative example of the diversity of approaches to resolving the dilemma presented above than what we are witnessing in the Middle Kingdom – a country that lifted itself from economic non-existence to the second largest economy in the world in merely 40 years. Nevertheless, it is impossible to discuss China's incontestable economic success without delving into and comprehending the costs that it entailed. It is the perpetual smog alert reverberating in China's big cities, the chronic shortage of drinking water, the contamination of groundwater and soils (and therefore, agricultural crops), and the omnipresent pollution in the country's main rivers and waterways. All of this can be encapsulated in a single phrase: ecological disaster. The list of symptoms signaling the breakdown and collapse of measures and systems designed to protect the environment could be extended endlessly using nothing but the example of China.

However, in these introductory remarks, we must go beyond describing the landscape of calamity that is the Chinese ecological reality. It is precisely because of the catastrophic state of the ecosystem in the Middle Kingdom that, for several years now, the Chinese authorities have been more and more audacious in introducing regulations on "respect for the environment," investing in low-carbon production, and promoting an ecological lifestyle. The relentless pursuit of economic growth at all costs is slowing down in the policy realm, albeit still gradually. Changes are emerging in China's economic policy, which is now moving toward embracing and supporting the country's sustainable development. This is apparent, for instance, in the government's push to transition toward renewable energy sources (RES) in the form of wind, solar, and hydroelectric power plants, as well as in the production of biomass and biofuels.

However, the most telling sign of change in this respect is China's accession to the Paris Agreement – the international climate treaty sealed on December 12, 2015. This was amonumental step that nobody could have imagined until recently. It came in tandem with a new perspective on the European Union and the environmental standards it champions. The European Union, viewed until recently as the obtrusive environmental educator with a penchant for pontification, is becoming not only a producer of the modern technologies that China seeks so badly and a source of crucial know-how, but also a point of reference in stepping up efforts to protect the environment in the country. But its role goes beyond

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that. The European Union is also a partner in carrying out political objectives on the international arena that advance sustainable development on our planet. Thus, if we consider the process of shrinking the hole in the ozone layer as evidence that it is possible for the whole world to cooperate, then the new era of cooperation between Europe and China also defines a *signum temporis* by identifying new ecological threats and challenges – and, more importantly, resolving them together.

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Chapter 1. The political phenomenon of China in light of the ideological struggle between the superiority of democracy and the advantage of meritocracy

It is hard to deny that China is currently commanding headlines and conversations around the globe. The country's rise from economic oblivion to the status of the second largest economy in the world in the space of a mere 40 years has, understandably, captivated observers worldwide. This includes both those who aspire to replicate China's success at home and those who perceive the newly minted leader in economic development as a threat to their own status and interests. Yet these observers are closely watching not only the economic growth of the 'Middle Kingdom,' but also the political ambitions that go in tandem with it – a connection that is all the more important given that it is occurring in the world's most populous country. The growth of these political ambitions is directly proportional to the economic status that China has attained.

Nevertheless, these developments do not make it easier to explain the phenomenon of China's return to great power status in the last four decades. The information overload of the modern day exacerbates this problem, blurring the boundaries between accurate and fabricated information, between cheap fascination and scathing condemnation that distracts from the country's accomplishments. This calls for a meticulous analysis of both the Chinese experience and Chinese ambitions – not only in the spur of the moment or to fulfill the intellectual need to decipher the secret of the 'Chinese dragon,' but because it is a historical necessity. Only in this way can we truly respond to questions that are critical for the future landscape of political regimes in the world, especially on whether political freedom is necessary for economic development and, relatedly, whether governance by the educated and competent are more effective than governance by the people. In brief, it is increasingly pivotal to find an answer to an age-old dilemma: does the future of state structures belong to meritocracy or to democracy?

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1. Delineating the European-Chinese political discourse in historical perspective by analyzing the use of the term 'state'

Virtually all commentary on the political system in China conveys arguments about the civilizational uniqueness of the Middle Kingdom. This is undoubtedly true. However, since China has applied market-based rules and frameworks to its economic activity just as successfully as the rest of the world, it is reasonable to assume that similar trends can be observed in the prevailing political canon of institutional solutions that exists in the country. The excessive reluctance to evaluate the existing political mechanisms in China derives from our unwarranted propensity to believe that a given country's cultural particularities automatically invalidate the universal rules of the political order that are fundamental for the civilizational development of that country. These mistaken assumptions fail to consider the fact that all of humanity is bound by the ambition to ensure the best conditions for its own development. Similarly, the desire for justice is deeply embedded within us all.

Thus, having accepted the two core goals mentioned above as the cornerstone for all scientifically supported theories on the origin of the state as an entity in the history of humanity (and avoiding fruitless debates on the validity of this assumption), we will first attempt to provide a comparative look at the designation of the 'state' as a term in Chinese political discourse, set against the trajectory of the term in Europe. As always, this is motivated by the need for not only methodological precision, but also clarity of discourse. Otherwise, we risk triggering an exchange of opinions that, admittedly, would be highly scientific in form, but meaningless in substance. More bluntly, the discourse would be devoid of almost all useful substance but rich in florid words and imagery.

This line of reasoning encourages us to first delve into written sources – even when their content does not always constitute a clear, substantive representation of the era in which they were written. Of course, this applies in equal measure to Confucian treatises and those that flourished in Europe based on foundations set by Plato and Aristotle. Even if they are sometimes difficult to comprehend, they still exemplify the reflections of those whose philosophical and structural deliberations revolved precisely around the state, its political system, governance structure, and implementation of said governance – all building blocks for the contemporary study of the state and its legal underpinnings. Much of these discussions are presented in ways that are accessible to modern-day scholars.

Extracting insight from written sources is also critical here because these materials are the most tangible point of access to a society at the earliest stage of its historical development, its prevailing concerns, and its intellectual horizons. It is without a doubt a simpler society than contemporary followers of Jean-Jacques

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Rousseau and similar purveyors of 'original happiness' would portray it as, with much narrower cognitive horizons. This comes through not only in the substance of these writings, but also the language and forms of expression that pervaded the era. Everything seems to indicate that whoever took on the task of capturing the structures of fledgling state systems in the early state-building era generally struggled to translate them to paper as precise legal norms. This undoubtedly stemmed from the fact that the frameworks governing logical argumentation and rational communication were only in their infancy at the time.

Although we will not find a formal definition of the state in Confucian political thought,[1] it is reasonable to dig deeper into the canon of classic Confucian books and writings,[2] as this will allow us to most effectively illustrate the evolution of the prevalent understanding of the nature of the state as well as the way it was framed in ancient streams of Chinese philosophical thought. Taking these writings as the starting point for an analysis of the state and its structures, a first observation to be made is that the use of a given logogram varied according to the nature of the political entity in question. Out of these characters, *fang* (方), *bang* (邦), and particularly *guo* (国) and *guojia* (国家) merit special attention.[3] Even this simple enumeration points to how heterogeneous the interpretations of the term 'state' were in Confucian writings. Just as importantly, it demonstrates that it is impossible to separate its etymology from its historical context – much less to fail to consider it completely. A worse idea still would be to rely on European *clichés* to distill and break down the characters in question. A comparative analysis – as surely all would agree – cannot amount to ramming the concepts signified in these characters into the lexical corset of a European conceptual framework in ways that are utterly detached from the historical realities of China.

An overview of ancient history shows us that if civilizations such as the Babylonians, the Egyptians, the Greeks, or the Romans had the opportunity to interculturally interact with each other in a more or less active and consistent manner,[4] the same certainly cannot be said of the Chinese civilization. In the case

1 Hsü Leonard Shihlien, *The Political Philosophy of Confucianism: An Interpretation of the Social and Political Ideas of Confucius, his Forerunners, and his Early Disciples*, Routledge, Abingdon 2005, p. 26.

2 The Five Classics consists of the *Great Learning* (大学, Daxue), *Book of Documents* (书经, Shujing), *Book of Rites* (礼记, Liji), *Book of Changes* (易经, Yijing), *Spring and Autumn Annals* (春秋, Chunqiu). The Four Books are comprised of the *Great Learning* (大学, Daxue), *Doctrine of the Mean* (中庸, Zhongyong), *Mencius* (孟子, Mengzi), and the *Analects* (论语, Lunyu).

3 Józef Pawłowski, *"Państwo" we wczesnej filozofii konfucjańskiej*, Wydawnictwo Uniwersytetu Warszawskiego , Warszawa 2010, p. 29. For a critical take on this publication (though still appreciative), see Mateusz Stępień / Maurycy Zajęcki, "Przegląd Orientalistyczny" 3–4 (2012), p. 207–217.

4 Feliks Koneczny, *O wielości cywilizacyj*, Wydawnictwo Gebethner i Wolff, Kraków 1935, p. 152–161.

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of the Middle Kingdom, the incompatibility of its state-building doctrine with the corresponding achievements recorded by those who adopted the legal foundations of ancient Rome in particular can be explained by China's centuries-old isolation from other civilizations. Thus, the need to clearly and outwardly manifest its particular approach to statehood was absent. This would explain why, at the dawn of the Chinese civilization, the markers of belonging included language and a specific culture, which converged to form the universalistic Chinese perception of the world known as *tianxia* (天下).[5] This stands in stark contrast to an approach to statehood that emphasizes well-defined territorial boundaries and a population that is not subject to the rule of a foreign power.

Ancient Hellas provides the best example of how this civilizational road was nothing unique in the evolution of the world's civilizations. Despite vigorous contact with the outside world, the idea of peacefully unifying all the Greek *polis* into one entity with the characteristics of a state did not pave a path for its own realization in Hellas. If we assume that language and culture were critically important to the process of shaping a national identity in both places, then it would be a mistake to ignore *a priori* the role of intentionally delineating the psychological distinctions between 'us' and 'them' in this process of identity creation. Defining these frontiers amounts to differentiating the civilized world of *huaxia* (华夏),as represented by China, from the rest of the world, which was perceived as being inhabited by barbarians. This juxtaposition via contrast is well known to scholars of ancient Greece (*oukoumene* – *anoikoumene*) and Rome, where literal and figurative *limes* (frontiers) separated two disparate world – *orbis romanus* and *barbaricum*.

According to Józef Pawłowski,[6] the reign of the Shang Dynasty (ca. 1600–1046 BC) saw the creation of the first term that described the concept of the state in detail as a political organization. Furthermore, in contrast to the generic designations mentioned above, it corresponded to a specific political entity. This term – *fang* (方) – denoted political bodies of the day that were not under Chinese control. Thus, somewhat paradoxically, a comprehensive designation that identifies the state as a territorial and political organization at a minimum first emerged in the Chinese consciousness in reference to forms of social organization among groups and peoples who were perceived as standing on a lower rung in the development process of civilizations, especially in Confucian thought.

In political practice, if we examine the trajectories of Chinese and European history comparatively, we can conclude that the emergence of a state is not merely a self-perpetuating process of transforming kinship communities into more complex political organisms. The contributions of illustrious individuals

5 Józef Pawłowski, *"Państwo" we wczesnej filozofii…*, *op.cit.*, p. 26.
6 *Ibidem*, p. 27.

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undoubtedly provided the *spiritus movens* necessary for such projects to come to fruition. After all, history textbooks are brimming with half-historical, half-legendary founders of individual nations. Thus, the aforementioned rules of sociopolitical development in the state-building process did not lose their importance under Chinese tutelage. A gradual transformation in the terminology used to describe the proto-state is evident as the spatially and geographically oriented *sifang* (四方 "four corners of the world") and *sihai* (四海, "four seas") were superseded by the ideologically loaded *tianxia* (天下), described above, and the rarer *sihai zhinei* (四海之内), which represented everything located between the four seas.[7] Both terms were rooted in the construction of a cultural and civilizational identity rather than purely geographical considerations.

The Middle Kingdom also shares certain characteristics with European states in terms of the stages of evolution that both underwent in the process of state-building. It is beyond doubt, for example, that the *bang* (邦) system, which involved the ruler bestowing land and property to his kin, is the precursor of the European feudal system. This similarity is underscored by the political nature of this phenomenon, as conveyed in the term *bangjia* (邦家). It is worth noting that this stepwise approach to creating political and state dependencies was also a feature of feudal Europe. Indeed, this is the underpinning for the term *state* in most European languages (*Staat*, *stat*, *état*, *stato*, *estado*), which derived is from *estate*, or a political entity originally understood as property of the monarch.

The term *guojia* (国家) conveys an entirely different message. *Guo* (国) is represented by a character showing a pike surrounded by walls, but in combination with *jia* (家), it denotes a family or household, depicted by a pig under the roof of a house.[8] What we see here is a bundle of themes (or connotation) that points to a political community deliberately associating itself with the concept of the family, surrounded by a wall and organized in line with military frameworks. It was only when *guo* was imbued with an ethical dimension via Confucius that the understanding of *guo* as a political entity composed of three elements (territory, people, and ruler) not only began to change, but also elevated the term's status in the hierarchy of Chinese political entities of the day.[9]

Finally, the search for similarities in the processes of state-building in the development of both models is further justified by the fact that transformations analogous to the *bang*-to-*guo* example took place in Europe – albeit more than a thousand years later. In the 'Spring and Autumn period' (722–481 BC), which was marked by the gradual weakening and disintegration of the central government in China, political entities (*bang*) hitherto dependent on the Zhou Dynasty began

7 *Ibidem.*
8 *Ibidem*, p. 29.
9 *Ibidem*, p. 33.

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to achieve autonomy – just as later in Europe, where similar circumstances led to the breakup of the patrimonial states in the early Middle Ages.

At the same time, it is important to emphasize that the European state in its modern form remains the political entity that originally took shape in opposition to the two universalistic power structures of the Middle Ages – papacy and empire. In fact, as the system that emerged victorious, it benefitted from the struggle for primacy between these two forces. Of course, China ultimately did not go down this path of state-building.

However, in the case of China, this missing link does not break the chain of similarities in the state-building processes that fed into the development of both civilizations. These persist in the way in which national (self-)consciousness crystallized in both cases as a core ingredient enabling the existence and development of a country. Both in China and in Europe, the systemic processes of integration that eventually gave birth to centralized 'estate monarchies' resulted in no small part from the notion of belonging to a defined cultural and linguistic community. This conclusion is bolstered by the latest of the Chinese terms created to designate this kind of community – *Zhongguo* (中国), or the Central State.[10] This term – translated less literally as "Middle Kingdom" – ultimately became synonymous with the word "China" in the global lexicon and remained a permanent fixture therein.

Thus, an unbiased observer would most likely agree that comparing the development paths of state-building in China and Europe in their preliminary phase does not reveal any irreconcilable differences or fundamental contradictions. In both cases, we see forms of development that come down to the transformation of original forms of collective life into political entities with an ever-increasing degree of organizational complexity. This observation, while banal, takes on an entirely different meaning if we consider that the development of human communities in other parts of the globe not only failed to follow the same path, but in fact stopped altogether at a certain stage. Whether this stagnation or collapse came as a result of dwindling 'vital forces' (however one might interpret them)[11] or the fossilization of existing forms of sociopolitical organization and leaders' resolve to wall their societies off from external influences is a question that fascinated and puzzled successive generations of philosophers for centuries.

10 *Ibidem*, p. 32.

11 Feliks Koneczny, *O wielości cywilizacyj*, *op.cit.*, p. 310–316.

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2. The term 'state' as a useful heuristic for the exploration of epistemic differences and similarities in the analysis of political discourse in Europe and China

In undertaking the task of reconstructing political views regarding the state, its function, and its role in European and Chinese discourse (both internally and externally), the structural-historical analysis of language used in classical texts is necessary but highly insufficient. Thus, we believe it is critical to supplement this method with a legal analysis of political systems, as only then will the historical context of the time become clear. However, it is also important to refrain from mechanically projecting modern notions of political systems onto past entities and sociopolitical phenomena – even when, like here, such a cautionary note already underlies the analysis. This cautionary note underlies the analysis presented here and becomes especially crucial when the object of analysis is precisely the term 'state' – a key component of an accurate description of a given political entity's systemic evolution.

This is not an easy task, especially when the goal is to trace the origins of the state, i. e., to pinpoint the causes and circumstances of its emergence in the history of human civilizations. It is a topic vast enough to easily fill the shelves of many a spacious library. Thus, it would be untimely to conduct a detailed investigation on the streams of thought on the genesis of the state among thinkers across time and geographical boundaries. All of these currents come down to the framing of the state as a) the product of a supernatural power or b) the product of human ingenuity. Defenders of both positions have inextricably tied their own to a secondary thesis on the need for a state as the enabler of the natural order of human societies.[12]

Thus, abandoning the ambition to carry out a comprehensive examination of the philosophical variants surrounding the two primary hypotheses on the origin of the state allows us to avoid the temptation of changing course toward the philosophy of history rather than the present focus. In the context of this systemic analysis, it is much more important to define what we mean by 'state' and what function we believe it serves. The answers to these questions are facilitated by splitting the analysis into three dimensions that reflect the state as:

a) a form of social organization;
b) a structured locus of power;
c) an entity governed by international law.

12 This consistency of thinking is illustrated, on the one hand, by older works such as those of Eugeniusz Jarra (*Ogólna teoria prawa*, Wydawnictwo Gebethner i Wolff, Warszawa 1920, p. 91–97), and on the other, by newer research such as that of Reinhold Zippelius (*Allgemeine Staatslehre*, C.H.Beck, München 2017, p. 95–100).

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It is entirely plausible that the ancient inhabitants of both China and Europe perceived the political entities of the day primarily through the lens of organizing society. Assuming that the state is a horizontal structure, it is governed by the principle of *quid pro quo* justice: I give up part of my freedom in relation to you so that you can give up part of your freedom in relation to me in the name of common benefits and the common good, which is overarching societal peace. It is exceedingly difficult to pinpoint when and in what circumstances this line of thinking penetrated into the social consciousness of ancient societies. In this case, the timeline remains vague at best and it becomes absolutely impossible to reconstruct a credible historical narrative. However, several fundamental changes do emerge, and the events involved, though difficult to capture in detail, laid the foundation for currents of political thought and systemic action that ultimately lasted for centuries.

Contrary to the deliberations on the understanding of the state as a form of social organization, a systemic and legal analysis allows us to grasp all the structural and organizational elements of the state that, when compiled, may bring us closer to an answer on whether humanity followed similar paths of systemic development in different parts of the globe. Furthermore, if the answer is negative, it may reveal new insight on whether the differences we identify are possible to overcome, which has major implications for modern-day postulates on establishing codes of intercultural communication.

Whatever the case, an impartial observer of the field would no doubt be struck by the fact that there are already voices in the West – albeit still isolated ones[13] – that call for a change of gears in European philosophical discourse. This 'reset button' may consist in rejecting the speculative thinking that formed the cornerstone for European civilization and – according to some – relieving it of the weight of false premises and abundant prejudice by incorporating elements of Confucian thought. As Mateusz Stępień has accurately observed,[14] this approach would no doubt add substantive value to Confucian philosophy, as it would no longer be viewed exclusively as complementary to European philosophy, but rather as a separate entity or even a starting point for a reorientation of European approaches. At the same time, it is hard to disagree with the aforementioned author that drawing on the achievements of Chinese thought may be very useful given that it avoided many of the mistakes made in the European philosophical tradition, but it is important to remember that the prevailing Chinese currents

13 Michael Slote, *The Philosophical Reset Button: A Manifesto*, "Dao. A Journal of Comparative Philosophy" 14/1 (2015), p. 1–11. See also: Leigh Jenco, *Changing Referents. Learning Across Space and Time in China and the West*, New York 2015.

14 Mateusz Stępień, *Zasadnicze wątki konfucjańskiej refleksji nad prawem*, "Principia" LXIII (2016), p. 226–227.

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also stumbled into other fallacies and thinking traps that were unknown to Europeans.

Following the path traced by Stępień, we believe that it is important to define the criteria for assessing the defects of European legal thought and thus avoid focusing on its archeology in juxtaposing it with its Chinese counterpart. Similarly, in the process of reconstructing the assumptions and claims about the law embedded in Confucian doctrine, it is critical to recognize that this current of thought developed over centuries, bringing sometimes inconsistent reflections on specific legal issues. Hence, it is reasonable to agree with the conclusion that "Confucianism expresses a non-trivial way of thinking about the place of law in society that is perhaps valid even today."[15] It is similarly difficult to dispense with the reflection that follows it: "Extracting the most important motifs in Confucian legal thought, however, requires an interpretation of Confucian writings that takes into account both the contexts in which they arose and the distinctive way of philosophizing expressed in them."[16]

The inclusion of legal considerations embedded in the Chinese ontology of the social world allows us to follow Stępień in pointing out that although legal issues do not occupy a central place in the Confucian treaties, Confucius' remarks regarding the relationship between social and moral abilities on the one hand and the law on the other do not uniformly glorify the former while marginalizing the latter.[17] This is because one of the fundamental characteristics of Confucianism is to aim to capture a full, comprehensive image of a given social reality rather than dive into any individual slice of it – a fact often overlooked in European discourse.[18] Another reason for this lack of uniformity is that Confucianism is a complex and multidimensional tradition that has been a key influence and reference point for more than 2,000 years.

The observation above is well-grounded and important insofar as we consider that, as opposed to its European equivalent, Chinese philosophical thought never fleshed out a separate strand of thinking about the law.[19] Whereas European political philosophy – in keeping with the juridical philosophy of Ancient Rome – understands the state as inseparable from its legal underpinnings, Confucianism

15 Mateusz Stępień, *Zasadnicze wątki…*, *op.cit.*, p. 229.

16 *Ibidem.*

17 *Ibidem*, *op.cit.*, p. 229–230.

18 Anna I. Wójcik, *Filozoficzne podstawy sztuki kręgu konfucjańskiego*, Wydawnictwo Uniwersytetu Jagiellońskiego, Kraków 2010, p. 43. See also: François Jullien, *Drogą okrężną i wprost do celu. Strategie sensu w Chinach i Grecji*, Wydawnictwo Uniwersytetu Jagiellońskiego, Kraków 2006, p. 151–167.

19 Mateusz Stępień, *Konfucjańska teza o prymitywizmie aksjologicznym prawa* [in:] Michał Dudek / Mateusz Stępień (ed.), *Aksjologiczny wymiar prawa*, Nomos, Kraków 2015, p. 162–184.See also: Roman Sławiński (ed.), *Konfucjanizm i jego współczesne interpretacje*, Wydawnictwo Naukowe Askon, Warszawa 2013, p. 7–38.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

views the law as an unstable tool of implementing social order, susceptible to instrumentalization and manipulation and predicated on many other factors.[20] In other words, according to Chinese philosophy, the perception of the law as the personification of the state (as in the European approach) does not induce the desired and expected effect of bringing order to social relations in the long run. Nevertheless, certain changes can be observed even here, given that the current leader of China has stated in a speech that "the rule of law is the fundamental tool through which to govern a country."[21]

Nonetheless, we hesitate to consider the differences mentioned above as fundamental to the political discourse of Europe and China, primarily because it is relatively easy to find other reflections in Europe's ideological heritage that are somewhat parallel to the understanding of the state as no more than the embodiment of the law. The thrust of these narratives is expressed in such heuristics as the representation of the state in Hobbes' *Leviathan* or (in the realm of fiction) Kafka's *Castle* and the hyperbolic caricatures of Huxley's *Brave New World* and Orwell's *1984.* Other representations of the state, including the *laissez-faire* night watchman, the welfare state, and especially the state as a protector of the rule of law are all unique and worth highlighting.

The question of whether it is acceptable to resist state power and refuse the state's authority also reveals surprising developmental parallels. The sacralization of power, whether understoodas the execution of authority based on a mandate from the heavens (as in Chinese political thought) or on behalf of God (as in its European counterpart) brought to light a pivotal systemic question that was probed on a daily basis: when and in what circumstances doesdisobedience toward the structures of power become admissible? In China, much like in Europe (though much later in the latter) the answer is straightforward: when power becomes unjust. Even if one assumes that the criterion of (in)justice is unclear or even obscure in the canon of political devices, it remains beyond discussion that the mere creation of such a threshold for morally permissible behavior on the part of authorities is already a politically significant step in the evolution of a civilization.

Thus, Mencius (ca. 370 – ca. 290 BC) is rightly perceived as the most eminent Chinese thinker after Confucius (ca. 551 – ca. 479 BC)[22] who, drawing precisely on moral principles, believes in the right of the people to compel a change of power (革命, *geming*,) if those currently occupying the seat of power are unjust – or, to put it more bluntly, unethical. Despite accepting the principle of respect for

20 Mateusz Stępień, *Zasadnicze wątki…*, *op.cit.*, p. 239.

21 Xi Jinping, Przemówienie 4 grudnia 2012 roku z okazji 30. rocznicy uchwalenia i wprowadzenia obecnej Konstytucji [in:] Xi Jinping, *Innowacyjne Chiny*, Wydawnictwo Kto jest Kim, Warszawa 2015, p. 153.

22 Wen Haiming, *Chinese Philosophy*, Cambridge University Press, Cambridge 2012, p. 31–37.

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the individual stemming from the assumption that all people are innately good and the contention that "the people are the most important element in a nation; (…) the sovereign counts the least,"[23] Mencius does not opt for the democratic political ideal of replacing the sole ruler with the rule of the people. Similar lines of thinking can be gleaned – albeit to varying degrees – from the European classics of political philosophy, from Plato and Aristotle, through Thomas More and Tommaso Campanella, to Edmund Burke. Indeed, the ideal of a just ruler is one of the archetypes of Chinese and European philosophical thought without which our conduct as *homo politicus* would often be difficult to comprehend.

Thus, discarding a line of argumentation based solely on the question of whether the state and the law are synonymous at their core, we remain steadfast in our conviction that the titular divergence in the development of statehood in Europe and China is based not on differing approaches to the boundaries between the governing power and the governed subjects, but rather on different starting values assigned to the individual and the community. This is because, as noted above, the European study of the constitutional law of the state, which is rooted in Roman law, treats the state as the regulated order of things, explains its structural organization, and outlines its basic principles of operation. In short, it identifies the state with its legal regime, in the spirit of Cicero's "*Quid est enim civitas nisi iuris societas civium.*"[24]

Conversely, in Confucian philosophy (which remains our point of departure), the idea of impersonal rules, orders, and prohibitions imposed by the law is completely unacceptable. The deeply instilled forms of virtuous social conduct championed by Confucius (力, *li*) were intended to function independently from state power – and differently as well, given that the law (法, *fa*) had to be continuously enforced by an administrative authority.[25] For Confucius, the foundation of governance was not only to accept certain moral principles (virtues) but to respect them;[26] it is therefore not surprising that his philosophy emphasizes the ritualization of everyday life rather than its judicialization. Thus, it is not *iurisprudentia*, but *ritusprudentia* that is considered critical to maintaining public order in Confucian thought.[27]

23 Ernst Schwarz, *So sprach der Meister*, Bechtermünz Verlag, Augsburg 1998, p. 123.

24 Marcus Tullius Cicero, *De re publica*, I. 49. ["What is the state if not a community of citizens rooted in law?"].

25 Marta Dargas, *Idee i zasady konstytucyjne chińskiego porządku prawnego*, C.H.Beck, Warszawa 2017, p. 41.

26 The most important of these include: respect for other people, justice, loyalty, honesty, and integrity.

27 Antoni Kość, *Prawo a etyka konfucjańska w historii myśli prawnej Chin*, Pracownia Poligraficzna przy Prywatnym Liceum Ogólnokształcącym, Lublin 1998, p. 229.

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This pattern of thinking is also usefully illustrated in Confucius' contention that *fa*, as a form of governance that relies on legal acts and statutes, amounts to the imposition of certain types of behavior that are unnatural for the individual and often incongruous for their role in society. This is because *fa* is based on obedience to external norms, while *li* – though also a system that compels the individual to obey – is based on intrinsic, internal motivations.[28] This enables us to characterize the Confucian social order[29] in the state as a form of order that relies on the primacy of tradition and the system of norms enshrined in *li* rather than legally mandated law. Furthermore, even if the law is framed as a set of norms and rules of conduct, it is only mentioned in a punitive context. This observation shows Confucianism as an example of a framing that identifies the conditions that must be fulfilled to achieve virtue, but avoids explicitly stating what is good and virtuous.

3. A political duet: Good governance in Confucian thought and Kelsen's democratism of freedom

Although, in Georg Jellinek's classical definition,[30] the state is still understood as a form of organization and a means of executing sovereign power over people living in a given territory, it is impossible to overlook the impact of the democratization of the political process on its structure and interpretation. When the state becomes the property of all its citizens, it inevitably becomes an arena of struggle among individuals and groups representing not only diverse interests, but also different ways of realizing them. Hence, the modern-day citizen expects the democratic political process to ensure two things: first, that the right people will exercise power, and second, that their decisions will serve justice and the public good.

To use a literary metaphor, the state can be visualized as a ship's nave whose steering does not come down to ably navigating and clearing diverse conflicts and disparate interests. Thus, the perception of democratic politics in Schumpeter's economic terms[31] – as a competitive struggle for power and office – does not facilitate our understanding of the essence of the development of the modern

28 *Ibidem*, p. 84.
29 Dorothy Hoobler / Thomas Hoobler, *Confucianism*, Chelsea House Pub, New York 2010, p. 10.
30 Georg Jellinek, *Allgemeine Staatslehre*, Verlag O. Häring, Berlin 1914, p. 144.
31 Joseph A. Schumpeter, *Kapitalismus, Sozialismus und Demokratie*, Francke, Bern 1946, p. 448.

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state. In the same vein, Max Weber's[32] observation that democracy and demagogy lie very close to each other is insightful but insufficient. It is far more important to point out – as John Rawl does[33] – the importance of what can be called the universal pursuit of justice. An impartial look at human nature would surely reveal that if the one thing with which we cannot dispense is property, then freedom from lawlessness is the one thing without which we do not wish to live.

However, even this broad presentation cannot be considered exhaustive. The state is not a legal phenomenon (legal entity) fixed in time and space, nor can it be explained solely from a legal perspective. At the same time, it is difficult to disagree with the position that the first and most cardinal feature of the state is the creation of (rule of) law, it is certainly not the only one. While the modern study of the state does provide us with the tools to explain a subset of its characteristics, it is only through the study of politics that we can acquire insight into the entire toolbox that state actors use to bring their goals to fruition, as per Aristotle.[34] The importance attributed here to the instruments of state policy can be easily explained if we consider such notions as the study of what constitutes a good/wise state and the art of governing a country to be linguistically equivalent to the Aristotelian understanding of politics (*πολιτικήεπιστήμη*).

These assumptions allow us to reiterate that the study of constitutional law, set in a foundation created by Roman law, treats the state as the regulated order of things, outlines its structure and internal dependencies, and finally describes the basic rules that govern its operation. In short, it follows Hans Kelsen's idea of the state as the ordered totality of human behavior according to the laws of nature and legal norms.[35] Politics does not operate exclusively in this way. Extending Aristotle's school of thought leads us to perceive it in terms of continuous changes to the prevailing order of things and the ways in which they are achieved. Thus, politics is an indication of the goals and paths that public life should follow and the means it may rely on to achieve them. It is also the observation and acute awareness of the impact of established laws on social relations and, if necessary, the ability to mitigate or remove their harmful effects on those relations. Sim-

32 Max Weber, *Wirtschaft und Gesellschaft. Grundriß der verstehenden Soziologie*, J.C.B: Mohr Verlag, Tübingen 1972, p. 86.

33 John Rawls, *Eine Theorie der Gerechtigkeit*, Suhrkamp Verlag, Frankfurt a. M. 1975. See also the following analysis of this aspect: Patrick Howard Nowell-Smith, *Eine Theorie der Gerechtigkeit?* [in:] Otfried Höffe (Hrsg.), *Über John Rawl's Theorie der Gerechtigkeit*, Suhrkamp Verlag, Frankfurt a. M. 1977, p. 77–107.

34 Aristotle, *Polityka*, Wydawnictwo Naukowe PWN, Warszawa 2004, vol. VII, chapt. 12.1, p. 202.

35 Hans Kelsen, *Das Wesen des Staates* [in:] Hans R. Klecatsky / René Marcic / Herbert Schambeck (Hrsg.), *Die Wiener rechtstheoretische Schule*, Franz Steiner Verlag, Stuttgart 2010, p. 1403.

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ilarly, politicscan be interpreted as the ability to strive for the removal of flaws and imperfections in existing institutional configurations.[36]

The experience of Roman jurisprudence in antiquity that brought about a fundamental change in future generations' understanding of the law also merits attention. It is from this period that the law, split into a dichotomy of private (*ius civile*) and public (*ius publicum*) lawusing the criterion of "benefit" (*utilitas*), beings to be identified with the entirety of legal norms that regulate social relations between persons, between persons and things, and between persons and the state. As opposed to private law, which protects the interests of individuals, public law takes on the objective of safeguarding the common interest and thus benefit society as a whole. This was not the case in China, where the distinction between the public and private sphere did not exist, thus separate mechanisms governing each of them could not take root. From the family to the state, the proper performance of all the links in the chain was contingent not on the law, but on Confucian norms of ritual and etiquette, which were enforced primarily through public pressure.[37]

In spite of the seemingly obvious truthfulness of this statement, European perceptions of Confucian philosophy habitually ignore it and do not accept (or refuse to accept) that, for centuries, Confucianism emphasized the individual's social obligations and interdependencies rather than their autonomy. Significant importance was given to the culture of personalized deal-making (关系, *guanxi*) rather than to the pursuit of one's claims in a court of law.[38] Terms such as individual liberty and the aspiration to participate in public life were completely unknown, while the European ideals of civil society were unfathomable, especially in their rebellious incarnation. Thus, we can affirm that the philosophical traditions of Confucianism lacked any ontological basis for the perception of an individual as an autonomous entity and society as the aggregate of such entities. Since Confucianism cemented paternalistic forms of power by perceiving the individual primarily as a member of a larger community, it is is not surprising that the value of the individual is seen primarily through the lens of their socialization. Socialization, in turn, was understood as continuous self-improvement by gradually freeing oneself from the binds of primitive egoism.[39]

This point of view is partially reflected in the work of Hans Kelsen, whose mapping of terms describing relations between the citizen and the state is im-

36 Johann Caspar Bluntschli, *Allgemeines Staatsrecht*, Literarisch-Artistische Anstalt, München 1863, p. 1–2.

37 Krzysztof Gawlikowski, *Konfucjański model państwa w Chinach*, ISP PAN, Warszawa 2009, p. 90.

38 Maciej Walkowski, *Chińska strategia rozwoju społeczno-ekonomicznego. Implikacje dla Unii Europejskiej*, UAM, Poznań 2018, p. 97–104.

39 Krzysztof Gawlikowski, *Konfucjański model…*, *op.cit.*, p. 22.

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possible to omit when tackling this topic. A careful reading of *The Essence and Value of Democracy*[40] suggests a different approach to perceiving the role of the state as no more than a system to govern a community of citizens, as advocated by Marcus Tullius Cicero in *On the Commonwealth.* If we accept the thesis that the state exists not to do things by itself, but to create opportunities for the citizens to act on their own responsibility, we find that the *citoyen* of Jean-Jacques Rousseau's *Social Contract* is different from the *Bürger* of Kelsen's *Essence and Value of Democracy*, despite the latter's unabashed reverence for Rousseau. Rousseau's proposed transformation of the individual carries them from a state of natural wildness to a civilized life as part of society. Indeed, in this transformation, the *citoyen* receives a whole new identity or even a second nature that stands in clear opposition to their primordial one.[41] Conversely, for Kelsen, this transformation process does occur, but replaces the radical anthropology so eagerly espoused by Rousseau with a chain of metamorphoses that gradually reveal the foundations of the democratic order: "The freedom of anarchy gives birth to the freedom of democracy."[42]

Another characteristic thought in Kelsen's political philosophy is his attempt to pave a path leading from individual autonomy to the formation of structures that exercise power on behalf of individuals – always under the condition that the individual's right to self-determination is preserved to the fullest extent possible.[43] This is undoubtedly because, although many understand individual freedom as the starting point for the social contract, it is certainly not its final stop. Thus, it is not the state in itself that constitutes the point of departure for Kelsen's ruminations, but freedom. This freedom belongs to the individual rather than the collective – a freedom equal and accessible for all.[44] It is only this articulation of freedom that forms the principle underpinning democracy in Kelsen's view of the process of expressing the will of the people in the political realm.[45]

This starting point is absent from Confucian thought. Where in the first case (described above) the individual is equipped with certain rights, a system built on

40 Hans Kelsen, *Vom Wesen und Wert der Demokratie*, "Archiv für Sozialwissenschaft und Sozialpolitik" 47 (1920), p. 50 n. Published that same year as a book (38 pages) by J.C.B. Mohr (Paul Siebeck) in Tübingen. An expanded version (119 pages) was released by the same publishing house in 1929. Also worth mentioning is the post-war version, published in English by the author as *Foundations of Democracy*, "Ethics. An International Journal of Social, Political, and Legal Philosophy" LXVI (1955/1956), p. 1–101.

41 Wolfgang Kersting, *Die politische Philosophie des Gesellschaftsvertrags*, Wissenschaftliche Buchgesellschaft, Darmstadt 1994, p. 149 n.

42 Hans Kelsen, *Allgemeine Staatslehre…*, *op.cit.*, p. 6. [Aus der Freiheit der Anarchie wird die Freiheit der Demokratie; titles translated by the author unless otherwise noted].

43 *Ibidem*, p. 5–7.

44 *Ibidem*, p. 3.

45 *Ibidem*, p. 14.

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the premises of Confucianism replaces rights with obligations, duties, and tasks. The individual's pursuit of freedom thus becomes a sort of aberration of the mind – a dangerous and immoral deviation. It is not surprising that, in a framework defined by this tradition, many European ideals of sociopolitical life simply lose their meaning. Hence, truly adopting and maintaining these ideals would require a profound sociocultural transformation.[46] It is also beyond question that the ever-advancing transformation of the socioeconomic realities of China has triggered the expansion of a previously unknown individualism and the reinforcement of individual autonomy, though it should be added that these changes reveal themselves in different forms and to different degrees in individual regions and social circles.[47]

Naturally, such changes are welcome from the European point of view. However, thus far, this has not affected the accuracy and continued applicability of the overarching conclusions in the work of Roger Ames and David Hall. These authors argue that China still operates as a communitarian society whose rules and principles significantly differ from the individualistic and liberal social rules that draw from European cultural tradition. It is impossible for liberal democracy to triumph there, as the latter is a byproduct of an individualistic society,[48] whereas the dominant personality type instilled through Confucianism is the 'dependent personality.'[49] As a result, we can use China as a case study of personalistic, but certainly not individualistic democracy. Nonetheless, even here it is possible to detect certain similarities to Kelsen, as a reading of *The Essence and Value of Democracy* leads us to yet another conclusion. That is, the decisions of the majority cannot be framed as the sum of the actions of individuals. This finding, though somewhat self-evident, is explained in Kelsen's writing by the observation that the atomization of society compels individuals to create interest groups if they aspire to achieve anything in the political process.[50]

There is little doubt that, in its optimal form, democracy is the overarching factor that binds people together. This is reflected in Kelsen's work when he writes that "[he who is] politically free is the one who is, admittedly, a subject, but only of his own will rather than that of any foreign force."[51] This explains why,

46 Krzysztof Gawlikowski, *Konfucjański model…*, *op.cit.*, p. 13–14.

47 Tony Saich, *Most Chinese Enjoy More Personal Freedom than Ever Before*, "International Herald Tribune", 1–2 February 1997, p. 6.

48 David L. Hall / Roger T. Ames, *The Democracy of the Dead: Dewey, Confucius, and the Hope for Democracy in China*, Open Court, Chicago 1999, p. 230–235.

49 Krzysztof Gawlikowski, *Perspektywy demokratycznych przemian w Chinach* [in:] Waldemar J. Dziak / Krzysztof Gawlikowski / Małgorzata Ławacz, *Chiny w XXI wieku. Perspektywy rozwoju*, ISP PAN, Warszawa 2012, p. 234.

50 Hans Kelsen, *Vom Wesen und Wert…*, *op.cit.*, p. 22.

51 *Ibidem*, p. 4. [Politisch frei ist, wer zwar untertan, aber nur seinem eigenem, keinem fremden Willen ist].

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elsewhere, he defines democracy by highlighting the perfect overlap between the subject and the object of rule – that is, rule by the people and for the people. If the people are the subject, then Kelsen's question – what are 'the people'? – may appear rhetorical. Although his answer is not particularly revealing – 'the people' are an association of interest groups[52] – it is of paramount importance for the process of exercising power. It is hard dispute that there is a razor-thin line between expecting unanimity in decision-making in a diverse political environment and pure naïveté. While taking the principle of majority rule as the basis for democratic order, Kelsen stresses the need for this majority to be made up of a real majority, not merely an arithmetic one. All this is because, as he writes, "(…) the idea of the absolute majority (rather than the qualified majority) gives us the closest possible approximation to the ideal of freedom."[53]

Of course, it would be untrue and baseless to state that, in the practical application of democratic rules, all the decisions and actions of those in power are endorsed by those over whom they exercise authority. This is not possible, if only because – as Kelsen also, naturally, points out[54] – members of society have different beliefs and often conflicting interests. Nevertheless, democratic theory rightly notes that this system, by its very nature, requires gradually increasing uniformity between the will of the rulers and the will of the ruled. In a democratic system, all policies can be altered if necessary. This takes politics beyond the status of a dogma accepted *a priori* and transforms it into an empirical art to which – by law – all of society has the right to contribute. Thus, it is not surprising to discover that binding public institutions by law and protecting the rights of individuals in relation to them has (paradoxically) increased the effectiveness of the state.[55]

Democratic rulers are morally and – even more crucially in this context – politically obliged to respect the preferences of those they govern, as expressed in popular elections. The ability of political parties to compete freely and replace each other at the helm of government is a guarantee of this order of things. Citizens who are dissatisfied with the current regime have the opportunity to remove those representing it in the next elections. This is, of course, democratic *theory*. Yet today, the headlines in every news outlet amply demonstrate the consequences of policies and politics that deprive citizens of the sense of rep-

52 *Ibidem*, p. 15.

53 *Ibidem*, p. 9. [Und unter diesem Gesichtspunkte bedeutet allerdings *Majorität die relativ größte Annäherung an die Idee der Freiheit* (emphasis in original – H.K.)].

54 *Ibidem*, p. 22.

55 Mateusz Stępień / Maurycy Zajęcki, *Podstawy aksjologiczne rządów (przez) prawa w Chińskiej Republice Ludowej po 1978 roku* [in:] Joanna Marszałek-Kawa / Sylwester Gardocki (ed.), *Azjatyckie strategie polityki międzynarodowej i regionalnej*, Wydawnictwo Adam Marszałek, Toruń 2013, p. 111.

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resentation in democracy. At this point, the desire to regain control of one's own destiny becomes the greatest challenge – and one that cannot be ignored, as it can lead to deep social rifts and even deeper polarization, which ultimately spiral out of control in a way that makes it impossible for anyone to harness the ensuing chaos.

Confucian meritocracy shows us a different face of politics. Thankfully, it is not the face of the titular *Prince* depicted in Niccolò Machiavelli's classic treatise. Doing politics backwards provides us with an idea of the perils involved in building a state in which everything is formally geared toward following a specific order, but not everything is in order. Strong social order cannot be built on a foundation of statutory lawlessness or enforcement of human rights above all else; instead, it requires the universal acceptance of certain responsibilities within society. This is primarily because, according to the normative description of human relations, the language of responsibility is much more precise and creates much fewer openings for abuse than the language of rights. A close reading of the *Analects of Confucius* suggests that this is precisely the goal of meritocratic governance: "A ruler who has gained power through wisdom, retained it through benevolence, executes it with dignity while commanding respect among his people, but governs them against the prevailing customs of the land is not a good ruler."[56]

4. In search of a model for a functional state: Between the European *idée fixe* of liberal democracy and the reanimation of the Confucian ideal of meritocracy

Reading Francis Fukuyama – especially the observation that "for (…) the global community, the decline of the state does not lead to utopia, but to catastrophe"[57] – immediately brings to mind Mark Twain's celebrated *bon mot:* "reports of my death are greatly exaggerated."To paraphrase this: reports of the death of the state are greatly exaggerated. Research and commentary by such scholars as Robert H. Jackson, Alan James, and John Ikenberry[58] allows us to argue that the state in its modern form has succeeded and proven itself as a model of sociopolitical organization. The modern democratic state remains the prop-

56 *Dialogi konfucjańskie*, XV: 32.

57 Francis Fukuyama, *Budowanie państwa. Władza i ład międzynarodowy w XXI wieku*, Rebis, Poznań 2005, p. 137.

58 John H. Jackson / Alan James, *The Character of Independent Statehood* [in:] John H. Jackson / Alan James (ed.), *States in a Changing World: A Contemporary Analysis*, Oxford University Press, Oxford 1993, p. 5–8, and G. John Ikenberry, *The Myth of Post-Cold War Chaos*, "Foreign Affairs" 3 (1996), p. 79–91.

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erty of all its citizens, whereas corporations only belong to their shareholders. This perspective alone clearly reveals that the state constitutes an important intervening variable in the constellation of determinants of both domestic and international competitiveness. Subsidies and taxes have as much influence on the factors of production as public procurement has on the conditions of demand, not to mention the importance of economic legislation and its decisive role in assessing the conditions of competitiveness.

The development of modern societies entails (or at least should entail) changes in the way the state is run. This statement, although rather self-evident, has far-reaching consequences for our understanding of the role of the state in the modern age. It is impossible to overlook that, since the days of the French Revolution – when states began to claim authority over all citizens, including the wise and the foolish, the weak and the strong, the rich and the poor – the state has been undergoing transformations on a grander scale than in any previous century. This is why, when we reflect on the direction of development of contemporary statehood and especially systemic changes, it is worthwhile to always keep in mind everything that contributes to the identity of the state in its relations with its citizens. This includes how identity is shaped as an object as well as *whether* and *how* democracy is complemented by elements of participation and civic responsiveness that allow societies to react rapidly and, above all, more effectively to new civilizational threats and challenges. After all, the latter are likely to be a consistent feature of the world in the coming years.

The European way of formulating historical narratives is characterized by the conviction that the desire to participate in political life is part of human nature – or at least that an interest in matters of the state dwells inside us all. To justify this assessment, many authors immediately point to Herodotus as the first European historian to note that the conflict between Greece and Persia should be framed primarily as a clash of opposing civilizational approaches to the meaning and role of the individual. In this take, one camp comprises societies made up of free citizens who courageously enter battle to defend their homeland, while the other consists of a ragtag collective of marauders in slavish devotion to a clique of Asian satraps, scurrying from the battlefield whenever the opportunity presents itself.[59]

It is hard to deny the discerning accuracy of Herodotus' observation, which is buttressed by dozens of historical examples from both ancient and modern times. Nevertheless, it is also important to mention that freedom is neither the driving force nor an indispensable condition for active participation in public affairs and acting *pro publico bono*. Indeed, if it were otherwise, we would not have ultimately witnessed the fall of Athenian democracy, to cite an example relevant to Herodotus' writings. A deeper reflection on the causes of the decline

59 Herodotus, *Dzieje*, Czytelnik, Warszawa 2007, p. 20.

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of Athenian democracy, when juxtaposed with the vision of the state according to Confucius, allows us to corroborate Alexis de Tocqueville's rather gloomy observation that "What democracy lacks (…) is not always the capacity to choose men of merit but the desire and taste to do so."[60]

Amid all the legitimate and erroneous remarks concerning the evolution of the state, we should also keep in mind that the European perception of the state as an institution is completely incomprehensible in the domain of Confucian philosophy. While the prevailing currents of Europe's political thinking in this area can be roughly summarized using the principles of respectful competition and the need to balance antagonistic forces, Confucian political culture sees the state as a vehicle for implementing a sociopolitical order rooted in harmony, cooperation, and the pursuit of consensus.[61] From this perspective, the state is not a Leviathan against whom individual freedom must be defended, but the primary institution responsible for ensuring a prosperous life for society.[62] Thus, it is not surprising that, in (post-)Confucian countries, the state is omnipresent, if not omnipotent. Recognizing the central government's obligation to play the greatest possible role in social life stems from the conviction that politics is much more than just communication within a specified political framework to ensure law and order in the state.[63]

This is quite understandable because, at the moment, only the state is able to meet certain macro-level challenges, including universal education, access to medical care, and rule of law, to name only the most elementary ones. Meanwhile, it is easy to forget that creating a system that underlies both education and all other infrastructure that ensures that the state runs effectively requires a preexisting economy that is developed and highly efficient. If we add that it is extremely expensive to maintain such holistic systems, we will find it easier to understand why, in many countries, they are impossible to introduce. The reasons for this are not exclusively cultural, but also include strong economic factors.

In this context, the success of China was bound to capture the attention of the world, and efforts to find an explanation of how it came to pass have become a fixation for legions of researchers. In the span of a mere 30 years, more than

60 Alexis de Tocqueville, *Democracy in America*, New York, NY: Library of America, 2004, p. 226.

61 Lucian W. Pye, *"Wartości azjatyckie". Od efektu dynama do domina?* [in:] Lawrence E. Harrison / Samuel P. Huntington (ed.), *Kultura ma znaczenie*, Zysk i S-ka, Poznań 2003, p. 367–368.

62 Łukasz Gacek, *Rola konfucjanizmu w kształtowaniu ideologii państwowej w Chinach w XX w.*, "Krakowskie Studia Międzynarodowe" 3 (2015), p. 38.

63 Tu Weiming, *A Confucian Perspective on the Rise of Industrial East Asia* [in:] Silke Krieger / Rolf Trauzettel (ed.), *Confucianism and the Modernization of China*, Hase & Koehler Verlag, Mainz 1991, p. 35.

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600 million were lifted from a state of perpetual, centuries-old poverty and undernourishment to modest but undeniable prosperity.[64] Moreover, this occurred outside the regular playing field of politics that was tried and tested in many liberal democracies. The weight of this process – unprecedented in the history of our planet – still has not fully penetrated the European consciousness. The same can be said of the realization that a democratic system is not the only one that is able to ensure effective public administration and state governance, despite the fact that even democratic countries run the gamut from poor quality of governance to strong overall public administration.[65] Thus, one can mock the connection with the Confucian state and liken China to a gigantic (re-)education camp. However, we have to acknowledge that the meritocracy that has long pervaded China's public institutions in the interest of the public good has exercised authority over the country in the spirit of Confucius in a paternalistic, but certainly not arbitrary manner.

This certainly explains the high esteem and respect that continues to surround the loci of power in China, as noted by practically every researcher studying the country. It also helps us understand why public opinion polls show that a staggering 29 % of Chinese respondents consider it acceptable for competent authorities to make decisions behind closed doors when the corresponding percentage of support for such a statement in the United States is equal to zero.[66] Thus, it is incredibly compelling to argue that starving citizens care little about civil liberties, much like the illiterate care little about freedom of the press – particularly when we know that even a functional democracy is no guarantee of economic prosperity. After all, the transition to democracy in different countries of Asia and Africa has not accelerated economic development in most known cases.[67]

Given the above, we can invoke Walter Scheidel's argument that human development not only fails to follow the same paths in every case, but also pursues different destinations through different stages.[68] Modernization does not have to

64 Daniel A. Bell, *The China Model. Political Meritocracy and the Limits of Democracy*, Princeton University Press, Princeton 2015, p. 93–94, following World Bank estimates and their corresponding methodology.

65 Krzysztof Gawlikowski, *Perspektywy demokratycznych przemian…*, *op.cit.*, p. 225.

66 As per the work of David I. Hitchcock, Asian Values and the United States: How Much Conflict?, Center for Strategic and International Studies, Washington, D.C. 1994, analyzed and critiqued in: Adam W. Jelonek, Wartości azjatyckie jako platforma polityczna i przedmiot badań socjologicznych, "Azja–Pacyfik" 7 (2004), p. 13.

67 Krzysztof Gawlikowski, *Konfucjański model…*, *op.cit.*, p. 19.

68 Walter Scheidel, *From the "Great Convergence" to the "First Great Divergence": Roman and Qin-Han State Formation and Its Aftermath* [in:] Walter Scheidel (ed.), *Rome and China: Comparative Perspectives on Ancient World Empires*, Oxford University Press, Oxford–New York 2009, p. 11–23.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

be carried out exclusively through Occidentalization. Manuel Castells argues that, instead of societies living within liberal democratic systems, we should think of human collectives in the globalization age as networked societies.[69] Given the critical role that social bonds and new forms of communication play in these societies, their emergence should be viewed as the ideational cornerstone for a new or different version of the state of the future, if not a direct confirmation of Confucian outlooks.

Nevertheless, this immediately brings us to the question of whether putting this model of society into practice stands in opposition to the model of the state espoused in liberal democracy. Without underestimating cultural differences or ideological and philosophical disparities (but without demonizing them either), it is possible to distill certain elements from the sources available to us that point to a convergence – or at least to a movement in its direction. It is beyond question that modernization and civilizational development writ large are possible with enough long-term planning,[70] which – as we know – is exceedingly difficult to achieve in the course of the most common four-year mandate and the reshuffling of elites in power most commonly associated with it. Add to that the growing assertiveness of the electorate in liberal democracies and we can confidently reaffirm Krzysztof Gawlikowski's argument that decision-making in a democratic system would not have made it possible to so easily dismantle Mao's 'barracks communism' or achieve the spectacular socioeconomic development that China began to consummate at the end of the 20th century.[71]

With that said, none of the existing forms of meritocratic rule,[72] whatever they may be called, provide us with an answer to a fundamental question: Why is it that an overwhelming majority of Nobel laureates are citizens of liberal democracies with individualism of thought and action at their core? Why does the lion's share of awards in all kinds of international competitions go to this specific group of people? Perhaps creativity and rebelliousness are not the defining qualities of Confucianism that it cultivated and helped flourish in the name of the common good? After all, with all due respect to the 2,500-year history of Confucianism in China, it is critical to note that the system of government created there, though highly developed, complex, and anchored in innovative rules governing civil service, is also extremely bureaucratized and unnecessarily formalistic.[73] It is a system based on rule by experts – one that, we should add, did not favor risk-taking or venturing into *terra incognita* in every possible domain of

69 Manuel Castells, *Społeczeństwo sieci*, Wydawnictwo Naukowe PWN, Warszawa 2010, p. 9–32.
70 Sebastian Heilmann / Oliver Melton, *The Reinvention of Development Planning in China, 1993–2012*, "Modern China" 39 (2013), p. 580.
71 Krzysztof Gawlikowski, *Perspektywy demokratycznych przemian…*, *op.cit.*, p. 245.
72 Angus Madison, *Chinese Economic Performance in the Long Run*, OECD, Paris 2007, p. 24–26.
73 Krzysztof Gawlikowski, *Konfucjański model…*, *op.cit.*, p. 35.

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human thought. Or, to put it even more emphatically, it is a system of governance that is admittedly meritocratic at its core, but one whose driving force was not experimentation and discovery, as embraced by European civilization, but individual and social self-improvement.

Indeed, we can conclude that human curiosity, fueled precisely by the individualistic ambition to face the unknown, not only facilitated the great scientific discoveries of Isaac Newton, Blaise Pascal, Johannes Kepler, Antoine Lavoisier, Michael Faraday, Wilhelm Röntgen, Niels Bohr, Albert Einstein, and so many others, but also enabled the voyages and discoveries of Christopher Columbus, Ferdinand Magellan, Marco Polo, Vasco da Gama, and James Cook, led to the invention of the cross vault, nylon, and penicillin, allowed societies to harness various artistic and scientific aspects of life through useful innovations such as musical notation and Mendeleyev's periodic table, and finally empowered individuals to build dedicated tools and instruments such as the piano, the typewriter, the steam engine, the sewing machine, combustion and rocket engines, the transistor and the laser, the microscope, the telescope, the oil lamp, the telegraph, the telephone, the light bulb, the camera, the refrigerator, the radio, the television, and the computer. In a word, it enabled everything that ended up at the root of the democratic, liberal, and yes – individualistic spirit of European civilization.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

Chapter 2. Environmental protection in China as a new component of the Middle Kingdom's socioeconomic development model

If one were to succinctly describe the state of the environment in China, they could refer to the title of a well-known film by Todd Berger – *It's a Disaster*. But this disaster is far from beautiful if we consider the actual condition of the environment in the Middle Kingdom; indeed, it is difficult to overlook. Oskar Weggel writes that "when the country opened up to the world in the early 1980s, visitors to China could personally witness the catastrophic pollution of both air and water. (…) 90 % of the 400,000 state-owned and one million cooperative industrial plants had no treatment facilities whatsoever, and this has not changed significantly to date. (…) Large cities, which should already be under a permanent smog alert, are sometimes completely enveloped in dense fumes. Some rivers – including the country's artery, the Yangtze – are on the verge of ecological disaster. Many cities in northern China suffer from acute water shortages, while some townships are literally drowning in garbage."[74]

Needless to say, one could continuously (and probably endlessly) expand the list of symptoms of collapse within China's environmental protection regime as well as the natural environment as a whole. However, a measured research perspective requires that these introductory remarks go beyond painting a black picture of China's ecological reality. Precisely due to the disastrous state of the ecosystem in the Middle Kingdom, the government is becoming increasingly bold in introducing regulations on "respect for the environment," investing in low-carbon manufacturing, and promoting an ecological lifestyle.[75] The policy of economic growth at any cost is gradually fading into obscurity. China's broader economic policy is also undergoing a change in the direction of sustainable development on a national level. This is visible, for instance, in the pursuit of renewable energy sources (RES) such as wind, solar, and hydroelectric power plants, in addition to the production of biomass and biofuels. Nevertheless, the

74 Oskar Weggel, *Chiny*, Cyklady, Warszawa 2006, p. 172.

75 Maciej Walkowski, *Chińska strategia rozwoju społeczno-ekonomicznego: Implikacje dla Unii Europejskiej*, UAM, Poznań 2018, p. 249.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

most telling sign of change in this respect is China's accession to the international climate agreement of December 12, 2015.[76] This accord was a spectacular step that, until recently, no one could have imagined.

1. Environmental protection problems and socioeconomic development

Even a cursory scan of public discourse shows us that environment protection is sometimes perceived as an element of a media narrative constructed primarily by politically left-wing circles or ecological movements, which view rigorous environmental protection standards as the embodiment of their ideals. At the same time, there is no doubt about the causal relationship between the state of the environment and the effects of human activity, which today is understood as one of the consequences of socioeconomic development. After all, every society or community that is (self-)identified and constructed through the lens of transformation toward modernity anchors its activity in a given local ecosystem. This ecosystem comprises the atmosphere, the lithosphere, and the hydrosphere, which form a network of interdependencies that represent a global system. Thus, the link between the state of the natural environment and socioeconomic governance is indisputable.

Furthermore, spurring economic development remains contingent on the intensity of exploitation of the natural environment, defined here as a set of resources that are consumed in the production process. The desire for a country to achieve a set of predetermined socioeconomic development objectives must synchronize not only with ensuring a satisfying level of material well-being for the population, but also with preserving appropriate environmental conditions. After all, the vitality of the natural environment in which humans live is one of the determinants of overall quality of life.[77] Assuming this reasoning is correct, the issue of protecting and shaping the natural environment constitutes an important component of socioeconomic development, as the production capacity of every economy depends on a number of factors. Some of these – in addition to fixed assets, technological advancement, scale and type of production, and the

76 Paris Agreement, United Nations, December 12, 2015, https://sustainabledevelopment.un.org/content/documents/17853paris_agreement.pdf.

77 Michał G. Woźniak notes that the term 'well-being' can be operationalized as a high level of fulfillment of a population's fundamental and cultural needs, which in turn can be measured using individual and societal consumption. The variables that affect this metric include accumulated material goods, infrastructure, and leisure time, but also the quality of the natural environment. See Michał G. Woźniak, *Wzrost gospodarczy. Podstawy teoretyczne*, Wydawnictwo Uniwersytetu Ekonomicznego, Kraków 2008, p. 25.

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professional qualifications of the labor force – are derived directly from the natural environment. These are natural resources and raw materials whose quality and abundance depends on their occurrence in a given country as well as on the expenditures incurred to extract them.[78]

This connects directly to the concept of economic growth, understood as the amount of goods and services produced in a given unit of time. Although this understanding of economic growth is primarily quantitative, it is important to consider the qualitative dimension as well.[79] This is particularly critical when the growth in question relies on the efficient use of the natural environment, which consists of natural resources and environmental conditions. Today, in the context of economic growth, these two elements are widely considered to be just as important as capital and labor.[80] Naturally, technical and technological development as well as the organization of labor must be given priority. However, this does not change the fact that development under a trajectory set by these factors may be severely hampered by a variety of obstacles, including a barrier related to the natural environment.

Predatory natural resource governance provides the best example here. The statement above is not as *cliché* as it may seem given its real-life social and economic dimensions. At present, humanity consumes 20 % more resources than nature is able to recreate. For example, between 1950 and 2000, GDP growth on the global level averaged 3.95 % (a sevenfold increase over the entire period) and the human population grew at an annual rate of 2 % (a twofold increase), while global production of energy resources increased by 45 %, that of food grew by 30 %, and that of metals – by 50–70 %.[81] Although the notion of sustainable development has been hammered home by innumerable entities representing a panoply of viewpoints (including, of course, the environmental dimension), there is little doubt that many societies still fail to grasp that nature can exist without us, but we cannot exist without nature.

Since there is feedback loop between the environment and socioeconomic development, it is reasonable to perceive the environment as an element that conditions the development of societies and economies (Figure 1). Thus, it is not possible to completely isolate the impact of the environment on the conditions of

78 Ewa Mazur-Wierzbicka, *Ochrona środowiska a integracja europejska: Doświadczenia polskie*, Difin, Warszawa 2012, p. 31.

79 Marek Świstak, *Fundusze Unii Europejskiej a pozaekonomiczne czynniki wzrostu gospodarczego*, Wydawnictwo Lettra-Graphic, Kraków 2012, p. 87–88.

80 Michał G. Woźniak, *Wzrost gospodarczy…*, *op.cit.*, p. 77.

81 Tadeusz Klementewicz, *Stawka większa niż rynek: U źródeł stagnacji kapitalizmu bez granic*, Książka i Prasa, Warszawa 2015, p. 88–90.

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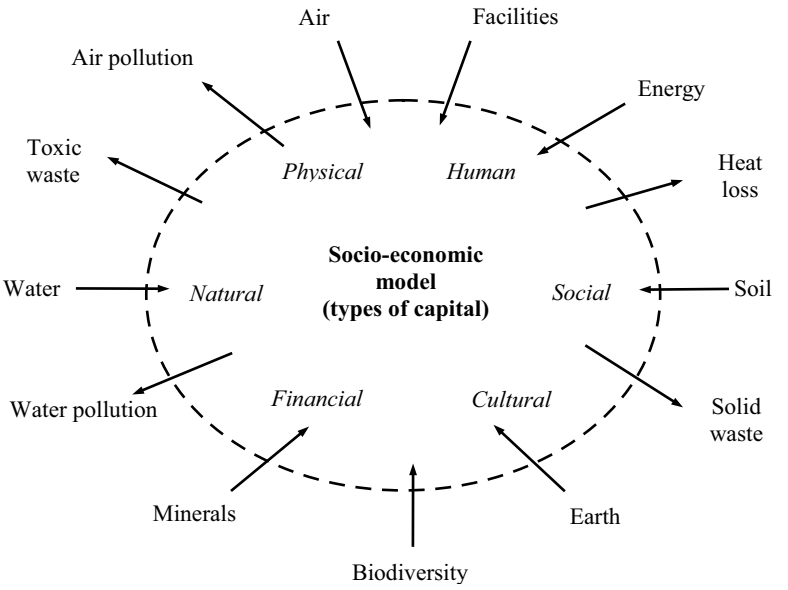
human economic activity,[82] as resources such as water, minerals, and soil are critical to the latter. As a result of technical and technological progress, the size of natural resource deposits is no longer considered as important today as it was before; nonetheless, it unquestionably represents a source of competitive advantage.[83] Countries like Nigeria, Gabon, or Saudi Arabia are illustrative of states where the tethering of a significant portion of the GDP to the export of natural resources goes in tandem with disproportionately low rates of economic growth.[84] At the same time, the development of some of the types of capital illustrated above as components of a model of socioeconomic development carries observable consequences for the ecosystem. Two compelling examples are environmental pollution in the form of contamination of inland water and heat loss from the processing (usually combustion) of non-renewable energy resources.

Illustration 1. Relationship between selected socioeconomic models and the environment



Source: Own work based on: Jose I. dos R. Furtado / Tamara Beltwith / Ramachandra Jamm, *Economic Development and Environmental Sustainability Policies and Principles for a Durable Equilibrium*, The World Bank, Washington 2000, p. 7.

82 Michael E. Kraft, *Environmental Policy and Politics*, Routledge, Abingdon–New York 2015, p. 10–12.
83 Michał G. Woźniak, *Wzrost gospodarczy…*, *op.cit.*, p. 77.
84 Pierre Buhler, *O potędze w XXI wieku*, Wydawnictwo Akademickie, Warszawa 2014, p. 166–168.

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Thus, there is no doubt about the need for a cohesive environmental policy, understood from an economic point of view as the rationalization of the use of nature's goods – in this case, natural resources. By extension, the question of when environmental protection determines economic growth is still relevant when the former appears as a cost at first glance.[85] In the short term, implementing measures related to environmental protection can be regarded as an additional burden on the economy and therefore a contributing factor to lower rates of economic growth. This is because refraining from excessive use of – for instance – non-renewable natural resources in the course of economic activity generates extra costs, in contrast with other entities who do not have to enforce such restrictions on themselves. The competition of developed countries with the economies of East Asia is one illustration of this. For decades, international environmental standards were of little interest to both the political elite and the public in the East Asian region. After all, what use is respect for the environment when poverty comes knocking – in more than just the metaphorical sense? Accordingly, some countries in the region have committed themselves to the principle of 'get rich first, protect nature later.'[86]

Nevertheless, the beneficial impact of environmental protection contradicts this reasoning in the long run by revealing the positive effects of such measures on the pace of economic growth. This is because the predatory approach to natural resource extraction deprives countries and regions of future development opportunities. Thus, environmental protection not only benefits local ecosystems but also opens up such opportunities for future generations. At the same time, the lack of pro-environmental measures must be framed as a burden on the current generations that can be expressed in specific monetary values or in a portion of a given country's GDP. These costs relate primarily to areas such as health, agriculture,[87] forestry, water resources, and fisheries. Although these are not the main areas of interest for economists in terms of socioeconomic development, their importance should not be underestimated. In the case of the Middle Kingdom, agriculture (and, within its scope, fisheries) accounts for a mere 7.9 % of the country's GDP, while industry constitutes 40.5 % and services

85 Terry Anderson / Donald Leal, *Free Market Environmentalism*, Palgrave, New York 2011, p. 1–5.

86 In the Chinese political reality, one can compare this to a slogan shared in practice and in spirit by the PRC elite: "It doesn't matter whether the cat is black or white, so long as it catches mice." This means subordinating all other goals – including environmental goals – to overarching economic objectives. See Bogdan Góralczyk, *Wielki renesans: Chińska transformacja i jej konsekwencje*, Wydawnictwo Akademickie, Warszawa 2018, p. 9.

87 Ma Wenyong / Wang Xunming / Zhou Na / Jiao Linlin, *Relative importance of climate factors and human activities in impacting vegetation dynamics during 2000–2015 in the Otindag Sandy Land, northern China*, "Journal of Arid Land" 4 (2017), p. 558–567.

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make up 51.5 % (2017).[88] However, it is indisputable that food remains a product of enormous strategic importance whose procurement is particularly sensitive to the fluctuations of environmental conditions.[89]

Thus, if we were to compare the costs of not being able to achieve future development with those of changing human behavior with respect to protecting the environment today, we would find that only prospective, long-term thinking produces a positive balance (Table 1). In this context, it is reasonable to recall the argument about the need for inter generational solidarity, interpreted in this case as handing down the resources of nature to those who will come after us. Concern for the ecosystem and the resources it provides goes beyond the ambits of the economy, ecology, and even politics; most importantly, it constitutes a major social problem. This is particularly true if we also consider that limiting the use of a specific natural good stimulates the development of innovations and technical/technological solutions whose nature is often also environmental.

Table 1. Typology of environmental pollution costs in the context of socioeconomic development

Cost category	Area
Health costs	mortality due to air pollution
	diseases due to air pollution, mortality due to water pollution
	mortality due to water pollution
Non-health costs related to water pollution	water shortages
	decrease in crop yields due to irrigation of agricultural lands with contaminated water
	decline in fish catches
Non-health costs related to air pollution	decrease in crop yields due to the occurrence acid rain
	material damage due to violent atmospheric phenomena

Source: own work based on: The World Bank, *Cost of pollution in China: Economic estimates of physical damage*, Washington 2007, p. XI–XXX.

The above considerations prove that any measurement or metric of socio-economic development should also take into account the costs of environmental degradation. This can significantly transform the dimensions in which officially reported growth figures operate. The example of China is especially notable here if one considers the economic impact of environmental pollution. China faces an

88 National Statistics Bureau of China, *China Statistical Yearbook 2017*, http://www.stats.gov.cn/tjsj/ndsj/2018/indexeh.htm.

89 Jeff Bennett, *Agriculture and the environment* [in:] Wang Xuehong / Jeff Bennett / Zhang Lei (ed.), *Environmental Protection in China, Land-Use Management*, Edward Elgar Pub, Cheltenham–Northampton 2008, p. 1–4.

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incredibly difficult challenge in its pursuit of replicating the Western model of development, where high levels of resource consumption and extensive interference with the natural environment co-evolved with a high standard of living.[90] In this context, the question of how to reconcile economic development with environmental protection becomes more understandable. The recent experiences of other East Asian countries also reveal that the crux of this dilemma lies in the state's ability to achieve a balance between a policy that favors only economic growth and one that exclusively emphasizes green solutions.

Regardless of which of these dimensions we are talking about, giving priority to one of them over the other demonstrates that neither of them is optimal. For instance, if the government's policy solely reflected an extreme pro-ecological stance, the economy would not be able to develop in low-investment conditions. In this scenario, it would become not only challenging, but downright impossible to lift entire social groups out of poverty[91] in East Asian countries. An optimal model of socioeconomic development must therefore contain both pro-investment and pro-environmental dimensions. At the same time, it is worth noting that these measures must not be limited to the toolbox of legal and legislative action, as neither bans nor directives alone automatically translate into, for instance, increased biodiversity. This allows us to qualify environmental objectives not as objectives in themselves, but as components of a broader socioeconomic policy.[92]

The European Union's approach to environmental protection merits special attention here, as its overarching policy is grounded in breaking the link between economic growth and increased use of natural resources. Thus, for the EU, one of the determinants of development is the adoption of environmental protection and rational steps to shape the natural environment. This is reflected in the concept of sustainable development,[93] which can justifiably be framed as a global approach in the geographical sense. This form of development seeks to integrate economic, social, cultural, and environmental objectives, making sustainable development a concept of horizontal, cross-cutting importance that stretches far

90 Chen Gang, *Politics of China's Environmental Protection: Problems and Progress*, World Scientific, Singapore 2009, p. 144.

91 Monica Das Gupta / John Bongaarts / John Cleland, *Population, Poverty and Sustainable Development: A Review of the Evidence*, "Policy Research Working Paper" 5719 (2011), p. 7–13.

92 On ecology as one of the goals of economic policy, see Bolesław Winiarski (ed.), *Polityka gospodarcza*, Wydawnictwo Naukowe PWN, Warszawa 2006, p. 60.

93 Marek Świstak / Jan W. Tkaczyński, *Polityka ochrony środowiska* [in:] Marek Świstak / Jan W. Tkaczyński (ed.), *Wybrane polityki publiczne Unii Europejskiej: Stan i perspektywy*, Wydawnictwo Uniwersytetu Jagiellońskiego, Kraków 2015, p. 261.

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beyond the environmental dimension.[94] In the environmental sense, sustainable development denotes an alignment of ecological and economic relations that does not lead to the depletion of environmental capital.[95]

Combining economic and environmental objectives allows us to distill the following five assumptions as especially relevant to resource management:[96]

- the availability of natural resources is limited;
- some of the discovered mineral deposits should be left undisturbed for future generations;
- the population has increased ecological expectations, which they count on being satisfied in the course of economic activity;
- purely technological and closed-circuit investments are highly cost-intensive;
- polluting and otherwise damaging the environment is economically untenable due to ecological losses and high social costs.

Whatever the arguments we use in favor of designing a cohesive environmental policy, we cannot forget that its creation lies within the purview of public authorities. In other words, for governments and international organizations, environmental policy is another area of not just passive interest, but also active influence. Hence, environmental policy affects or seeks to affect either the quality of environmental conservation or the exploitation of natural resources. It consists of a series of decisions or environmental arrangements regarding the range of objectives and desired effects as well as the choice of appropriate tools to achieve them. A policy framed in this way comprises measures and directives whose goal is to refrain from certain actions that could lead to environmental degradation.[97]

94 Tomasz Parteka, *Planowanie strategiczne w równoważeniu struktur regionalnych*, Wydawnictwo Naukowe PWN, Warszawa 2000, p. 16; Our Common Future, Report of the World Commission on Environment and Development, March 20, 1987, http://www.un-documents.net/our-common-future.pdf.

95 Ryszard Domański, *Systemy ekologiczno-ekonomiczne: Modelowanie współzależności rozwoju*, Wydawnictwo Naukowe PWN, Warszawa 1992, p. 17; Our Common Future, op. cit.

96 Barbara Prandecka, *Nauki ekonomiczne a środowisko przyrodnicze*, Wydawnictwo Naukowe PWN, Warszawa 1991, p. 252.

97 Michael E. Kraft, *Environmental Policy and Politics*, *op.cit.*, p. 16–17.

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2. The starting point: Diagnosing the state of the environment in China

At present, the state of the environment in China is a far cry from even the bare minimum that is needed to comply with environmental safety standards. But this statement alone does not suffice. On the one hand, it can be seen as editorializing rather than expressing a true scientific finding; on the other, it is both imprecise and unoriginal. As a result, we must characterize the economic collapse of China through numbers and facts, as this is the only way to not just improve our understanding of the scale of the problem in the Middle Kingdom, but to understand it correctly. Even more importantly, this allows us to try to assess whether the measures taken are appropriate, sufficient, and – crucially – focused not just on halting the continued degradation of the natural environment in some regions of China, but on reversing the ecological disaster. Further, it is critical to do this in a way that would be empirically measurable using both (weak) national standards and (stricter) international norms.

Experts commonly attribute the ecological disaster in the Middle Kingdom to the policy of unrestrained economic growth and development, which has spanned the last four decades and completely disregarded the environment. This is certainly the case, for instance, when we talk about the contamination of groundwater and the atmosphere through industrial activity. However, the conversation takes a turn if we additionally consider factors such as the ubiquitous use of China's rivers as convenient conduits for waste. This kind of strategy for household waste 'disposal' has nothing to do with the aforementioned pursuit of unfettered economic growth; it is rather a reflection of low civic culture and a low level of awareness of the need for environmental protection in Chinese society.

However, the world's second largest economy produces not only household waste but also environmentally hazardous industrial pollution. China is responsible for 28 % of global carbon dioxide emissions (for 2017),[98] 25 % of nitrogen monoxide emissions, and 35 % of all pollution derived from PM2.5 particulate matter (for 2010).[99] The scale of the emissions is striking in terms of percentages. Conversely, if we consider carbon dioxide emissions *per capita* (in tons per annum), China places far below Russia, the United States, or Germany, with a value lower than even the CO_2 emissions in Poland (Table 2). This level of emissions in China is mainly due to that country's large population compared to

98 Own calculations based on: International Energy Agency, *World Energy Outlook: The Gold Standard of Energy Analysis*, https://www.iea.org/weo/.

99 Łukasz Gacek, *Zielona energia w Chinach: Zrównoważony rozwój, ochrona środowiska, gospodarka niskoemisyjna*, Wydawnictwo Uniwersytetu Jagiellońskiego, Kraków 2015, p. 80.

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the others listed. Nevertheless, previous analyses of carbon dioxide emissions in different countries[100] clearly demonstrated that emissions generated by industrialized countries are greater than those reported by the developing world.

Table 2. Carbon dioxide (CO_2) emissions *per capita* in China compared to selected countries (tons per annum)

Country	1990	2000	2010	2013	2014	2016
China	2.2	2.7	6.6	7.6	7.5	7.0
Germany	11.9	10.1	9.3	9.4	8.9	9.0
Japan	8.9	9.6	9.1	9.8	9.5	9.0
Poland	9.7	7.8	8.3	7.9	7.5	8.0
Russia	11.0	11.3	12.8	12.4	11.9	10.0
USA	19.3	19.3	19.6	13.6	16.5	15.0

Source: own work based on: Human Development Data (1990–2017), http://hdr.undp.org/en/data# (1990–2014); International Energy Agency, Statistics Global energy data at your fingertips, https://www.iea.org/statistics/?country=USA&year=2016&category=Emissions&indicator=CO2ByGDPPPP&mode=table&dataTable=INDICATORS (2016)

The several-fold increase in carbon dioxide emissions *per capita* in the table above dervise from unfettered economic growth, as previously mentioned. This process is accompanied by increases in energy consumption, which in the case of China amounted to 23.2 % of the worldwide figure.[101] As such, it is not surprising that the largest emitter of carbon dioxide (9,101.5 million tons) in China is the energy sector (4,386.4 million tons), whereas the manufacturing sector places a distant second (2,849.7 million tons).[102] However, we must acknowledge that the demand for energy resources in the Middle Kingdom is relatively low compared to developed economies such as the OECD countries (6,078 kg *per capita*) or the United States (6,891 kg). Indeed, as per Graph 1, China's average *per capita* consumption of energy was 247 kg in 1970 (compared to a global average of 1,323 kg), increasing to 2,259 kg in 2017 (global average: 1,794 kg).

Nevertheless, the increase in China's demand for energy resources for 1970–2017 – 2,012 kg – was well above the global average of 471 kg. The moderate pace of the increase in the 1970s cannot come as a surprise, as prior to the expansive

100 International Energy Agency, *CO_2 emissions from fuel combustion, highlights*, Paris 2015, p. 12–13.

101 The corresponding statistic is 16.5 % for the United States and 14.6 % for Europe. BP Statistical Review of World Energy, June 2018, p. 8, https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/statistical-review/bp-stats-review-2018-full-report.pdf.

102 International Energy Agency, *CO_2 emissions from fuel combustion, highlights*, Paris 2018, p. 69, https://webstore.iea.org/download/direct/2373?fileName=CO2_Emissions_from_Fuel_Combustion_2018_Highlights.pdf.

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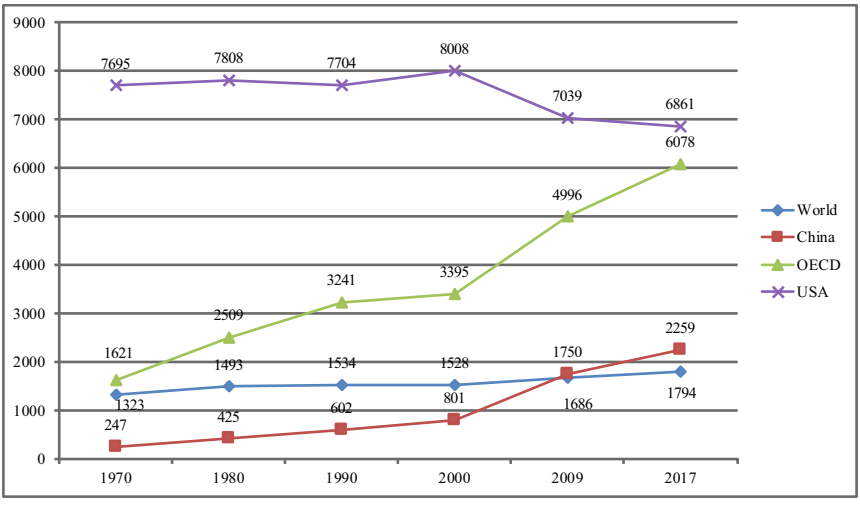
reforms initiated in 1979, the Chinese economy pursued a model of socio-economic development based on agricultural labor (agriculture constituted 34.8 % of China's GDP in 1970),[103] which did not generate large demand for energy. The last decade (2009–2017) has been characterized by a different pattern, with a clear upward trend (an increase of 509 kg) compared to the global average increase (108 kg).

Graph 1. Average consumption of energy resources *per capita* in China (kg) compared to selected world economies



Source: own work based on: *World Development Indicators*, https://databank.worldbank.org/data/reports.aspx?source=2&series=EN.ATM.CO2E.KT&country=#; Statistical Review of World Energy – all data, 1965–2017, https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/xlsx/energy-economics/statistical-review/bp-stats-review-2018-all-data.xlsx

Robyn Meredith's description dramatically enhances the significance of these dry figures: "Nothing can prepare visitors for the [air] pollution in China. In various cities, if you are indoors and open a window, a strong, foul odor confronts you immediately. It isn't that there is a bad smell in the outside air; it is that the air *is* the bad smell."[104] The extensive list of ecological problems in China, as described in Bogdan Góralczyk's book,[105] is hardly more optimistic. In the course

103 The World Bank, *World Development Indicators*, https://databank.worldbank.org/data/reports.aspx?source=2&series=EN.ATM.CO2E.KT&country=#.

104 Robyn Meredith, *Chiny i Indie. Supermocarstwa XXI wieku*, Media Lazar, Warszawa 2009, p. 296.

105 Bogdan Góralczyk, *Chiński feniks. Paradoksy wschodzącego mocarstwa*, Sprawy Polityczne, Warszawa 2010, p. 246–263.

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of documenting the state's predatory relationship with the environment, the author states that:

- Seven of the ten most toxic rivers in the world are located in China (only 20–25 % of all discharged water was treated);
- The seven most polluted cities are located in China; as a result, about 40 % of all deaths related to atmospheric pollution were in China;
- 75–80 % of the waters in Chinese rivers are unfit not only for consumption, but even for fishing;
- 90 % of the groundwater in China's cities is contaminated;
- Nearly 50 % of river waters are classified as Category 5, which is not even suitable for agricultural purposes;
- Two thirds of the Chinese cities where the World Health Organization (WHO) carried out its audit did not meet that organization's environmental requirements;
- Approximately one third of industrial waste and two thirds of municipal wastewater is channeled directly into rivers and lakes, without prior treatment. As a result, 75 % of Chinese lakes and half the length of Chinese rivers are seriously polluted;
- Acid rain affects almost a third of the territory of China, with varying intensity;
- About 40 % of agricultural land have experienced a decrease in quality in recent years (13–16 million hectares of land are polluted with harmful chemicals and 20 million hectares are contaminated with heavy metals);
- More than 700 million Chinese citizens have trouble accessing fresh water;
- Mangroves have disappeared from the coastal areas and algae have appeared in their place;
- Despite the existence of more than a thousand nature reserves, at least 15–20 % of the species of Chinese flora and fauna are threatened with extinction;
- The country's afforestation is about 16 %, whereas the world average is about 27 %;
- Desertification is accelerating dramatically; deserts in China already cover 25–28 % of the country's area and more than twice that of China's cultivated land.

The quality of the air we breathe is undoubtedly one of the elements of our environment that are relatively easy to examine organoleptically. A rudimentary research method, it consists in assessing the properties of the environment or object in question using the human senses: vision, smell, taste, hearing, and touch. Although the first three senses – in particular visual and olfactory cues – are entirely sufficient to draw preliminary conclusions about the quality of the air in China, they remain part of a subjective evaluation. It is therefore worthwhile to refer to the objective data we have for China. Thus, while it may seem surprising to link the two at this point, we should first bring up some statistical data on the

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degree of urbanization in the Middle Kingdom. While in 1980 – at the dawn of China's economic reform period – 81 % of the population still made a living from farming, this rate plummeted to 69 % at the beginning of the new century and fell below 50 % in 2012. In 2011, for the first time in China's history, the urban population (50.5 %) exceeded the rural population (49.5 %).[106]

From an ecological stand point, the process of urbanization would not be extraordinary in itself were it not for two distinct consequences of the kind of urbanization that accompanies rapid economic development. The first is connected to the most spectacular infrastructure change China has seen in the last two decades, i. e. the construction and expansion of road, rail and air transportation networks.[107] The second – the exponential increase in the number of cars in the country – is a testimony to the growth of the middle class and its cosmopolitan aspirations. The repercussions of both these interconnected processes is easy to predict: ever more cars on the road and ever more smog. In Beijing alone, more than 20 million inhabitants coexist alongside around 5 million cars traversing the city's roads on a daily basis. As a result, most of the pollution in the capital is no longer caused by the emission of fumes from the city's coal-fired thermal power plants (the last of which was closed down in 2017), but by vehicle exhausts.[108]

For many years, authorities in the capital city not only ignored the threat outlined above, but – worse yet – kept pollution data secret. They did not begin to reveal this information until 2014, following a speech by Hu Jintao – President of the State and Secretary General of the Communist Party of China (CPC) – during the Party's 18th Congress in November 2012, where a new approach to environmental protection was outlined. As a result, China instituted the so-called 'red alarm, 'which is sounded when air pollution exceeds two hundred times the permissible level for four days in a row, three hundred times the permissible level for more than two days in a row, or five hundred times the permissible level for at least 24 hours. This leads to the closure of educational establishments, workplaces, and construction sites, among others. A strategy like this is not surprising given that, in the last three decades, the mortality rate from lung cancer has more than doubled in the Middle Kingdom.[109] Air pollution from coal and solid fuel combustion as well as heating was the leading cause of morbidity in China in 2010, contributing to 1.2 million premature deaths.[110]

106 The World Bank, *World Development Indicators*, p. 258, https://databank.worldbank.org/data/reports.aspx?source=2&series=EN.ATM.CO2E.KT&country=.
107 Asian Development Bank, *Key indicators for Asia and the Pacific*, Manila 2018, p. 168–173.
108 Maciej Walkowski, *Chińska strategia rozwoju społeczno-ekonomicznego*, *op.cit.*, p. 259.
109 Ibidem, p. 261.
110 Yang Gonghuan, *Rapid health transition in China, 1990–2010: Findings from the Global Burden of Disease Study*, "Lancet" 381 (2010), p. 1987–2015.

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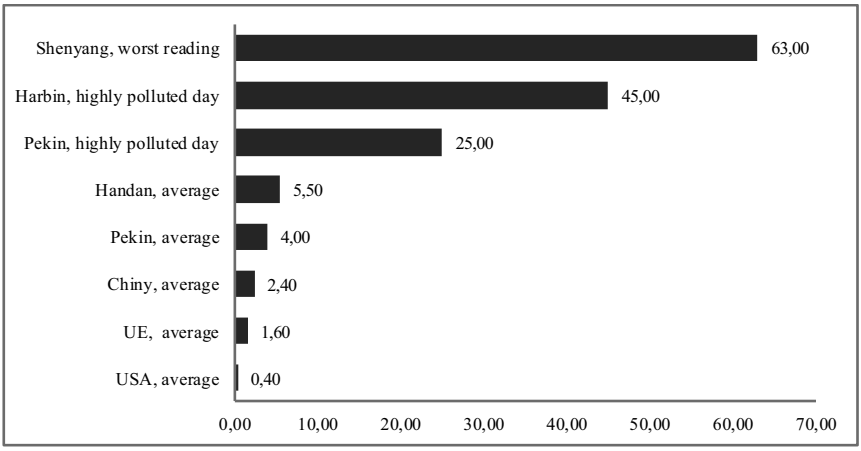
Graph 2. Estimated air pollution in selected cities in China as equivalent to number of cigarettes per day compared to the EU and US (2015)



Source: own work based on: Yang Bo-Yi at al., *Urgency to Assess the Health Impact of Ambient Air Pollution in China* [in:] Dong Guang-Hui (ed.), *Ambient Air Pollution and Health Impact in China*, Singapore 2017, p. 3.

The statistics on the number of deaths[111] caused by air pollution in China, as already mentioned here, tell us how dangerous air pollution is.[112] However, comparing air pollution with cigarette smoking appears to be more evocative and speaks more compellingly to people's imagination (Graph 2). This illustration allows us to use the method of interpolation to calculate air pollution using the so-called smoked cigarette equivalent, based on data obtained from satellite monitoring.[113] For example, in 2015, the average level of PM2.5 particulate matter in Beijing during the year was about 85μg/m^3, which corresponds to about four cigarettes smoked per day. The average value in the industrial city of Handan, located approximately 200 km south of Beijing, was about 120μg/m^3, i.e. 5.5 cigarettes per day. When the level rose to 550μg/m^3 in Beijing, it corresponded to 25 cigarettes per day. In this situation, when the air pollution in Harbin reached 999μg/m^3, it equated to an alarming 45 cigarettes smoked by every resident per day. On days with a high concentration of air pollution, its effects on

111 Lin Hualiang at al., *Air Pollution and Mortality in China* [in:] Dong Guang-Hui (ed.), *Ambient Air Pollution and Health Impact in China*, Springer, Singapore 2017, p. 103–122.

112 World Health Organization, *WHO methods and data sources for global causes of death 2000–2011*, "Global Health Estimates Technical Paper" 3 (2013), p. 3–18; Ren Lihong / Yang Wen / Bai Zhipeng, *Characteristics of Major Air Pollutants in China* [in:] Dong Guang-Hui (ed.), *Ambient Air Pollution…*, *op.cit.*, p. 10–26.

113 Robert A. Rohde / Richard A. Muller, *Air Pollution in China: Mapping of Concentrations and Sources*, "PLoS One" 10 (2015), p. 1–14.

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the health of the inhabitants are therefore comparable for the whole of China with the damage caused by smoking two packs of cigarettes a day (40 units), on average.[114]

Meanwhile, in 2017, about 70.7 % of the Chinese cities covered by national air quality monitoring (338 cities at the prefectural and regional level) failed to meet national air quality standards.[115] Only 99 cities were in line with the standards. It should be noted that Chinese standards are still less stringent than their international counterparts. As an example, China's national PM2.5 standards of 35 μg/m^3 per year and 75 μg/m^3 per day is more than three times those recommended by the World Health Organization, i. e. 10 μg/m^3 per year and 25 μg/m^3 per day.[116] Pollution in China is spatially heterogeneous and affects mainly urban centers. Among Chinese cities, the worst air quality (in order of most polluted) was recorded in Shijiazhuang, Handan, Xingtai, Baoding, Tangshan, Taiyuan, Xi'an, Hengshui, Zhengzhou and Jinan. The 10 cities whose air quality is the best in relative terms are (in order of least polluted): Haikou, Lhasa, Zhoushan, Xiamen, Fuzhou, Huizhou, Shenzhen, Lishui, Guiyang and Zhuhai.[117]

It is a well-known fact that air pollution is very dangerous for human health.[118] For example, fine dust particles that reach the airways, lungs, and blood are a risk factor for cardiovascular or pulmonary diseases. According to the World Health Organization, in 2016 alone, air pollution affected 7 million victims, 94 % of whom were from middle-income countries; 2.4 million deaths[119] were recorded in the South East Asia region alone (Graph 3). In China, life expectancy dropped by almost 25 months due to poor air quality.[120]

114 Yang Bo-Yi at al., *op.cit.*, p. 3.

115 Air quality is considered to meet national standards when the sum of the concentrations of all six assessed pollutants meetnational standards, with SO2, NO2, PM10 and PM2.5 assessed according to their average annual concentration and CO_2 and O_3 assessed according to their percentile concentration. See The 2017 Report on the State of the Ecology and Environment in China, May 2018, p. 8, http://english.mee.gov.cn/Resources/Reports/soe/SOEE2017/20180 8/P020180801597738742758.pdf.

116 On global air quality norms, see World Health Organization, *WHO Air Quality Guidelines for Particulate Matter, Ozone, Nitrogen Dioxide and Sulfur Dioxide – Global Update 2005*, Geneva 2006.

117 *Ibidem*, p. 10.

118 Cao Jie at al., *Association between long-term exposure to outdoor air pollution and mortality in China: a cohort study,* "Journal of Hazardous Materials" 186 (2011), p. 1594–1600; World Health Organization, *Review of evidence on health aspects of air pollution – REVIHAAP Project*, 2013, p. 1–5, http://www.euro.who.int/__data/assets/pdf_file/0004/193108/REVI HAAP-Final-technical-report-final-version.pdf.

119 World Health Organization, *Burden of disease from the joint effects of household and ambient air pollution for 2016*, May 2018, https://www.who.int/airpollution/data/AP_joint_ effect_BoD_results_May2018.pdf.

120 International Energy Agency, *Energy and Air Pollution: World Energy Outlook Special Report*, Paris 2016, p. 7.

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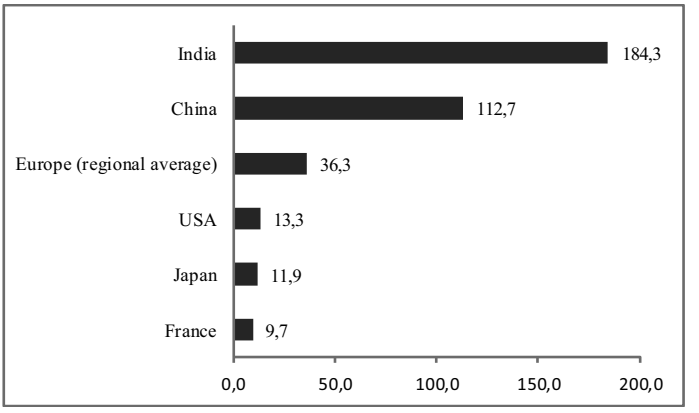
Graph 3. Mortality due to household air pollution (indoors) and ambient air pollution (outdoors) – number of deaths per 100,000 inhabitants (2016)



Source: own work based on: *Air pollution*, World Health Statistics data visualizations dashboard, 2018, http://apps.who.int/gho/data/node.sdg.3-9-viz-1?lang=en.

According to Chinese experts cited in the work of Maciej Walkowski,[121] the number one environmental problem in China is not air quality, but water – and specifically both its condition (quality) and its absence or scarcity. There are concerning interregional differences in access to water in the Middle Kingdom. Four-fifths of China's water resources are located in the south, largely in the Yangtze basin; on the other hand, Beijing, located in the north of the country, suffers from water shortages on a scale comparable to that of Saudi Arabia. Due to excessive water consumption, Chinese rivers simply vanish from existence. The number of rivers with significant water resources has decreased from over 50,000 in the 1950s to 23,000 today. Worse still, as a result of the drainage of underground aquifers, the groundwater level in northern China is dropping by an average of 2 meters every year. This causes two thirds of the largest Chinese cities to suffer from water shortages, as most of the water is drawn from these sources. As a result, the amount of water available per capita in China is only 2,100 m^3 per year – only 28 % of the global average.[122]

Bodies of water in China are divided into five categories according to their purpose and protection (Table 3):

121 Maciej Walkowski, *Chińska strategia rozwoju społeczno-ekonomicznego*, *op. cit.*, p. 251–256.
122 Water shortage, pollution threaten China's growth, http://www.china.org.cn/environment/2012-02/16/content_24653422.htm.

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- Class I is water from springs and national nature reserves;
- Class II are first-class protected areas which include sources of drinking water, protected habitats for rare species of fish, and spawning fields for fish and shrimp;
- Class III is the second class of protected areas, including sources of drinking water, protected areas for ordinary fish, and bathing areas;
- Class IV is water used for industrial and recreational purposes that does not come into contact with the human body;
- Class V denotes bodies of water used for irrigation of agricultural land.[123]

Table 3. Classification of surface water quality in China in 2017 (%)

River basin	Class I	Class II	Class III	Class IV	Class V	Class V+
Yangtze	2.2	44.3	38.0	10.2	3.1	2.2
Yellow River	1.5	29.2	27.0	16.1	10.2	16.1
Pearl River	3.0	56.4	27.9	6.1	2.4	4.2
Songhua	-	14.8	53.7	25.0	0.9	5.6
Huaihe	-	6.7	39.4	36.7	8.9	8.3
Haihe	1.9	20.5	19.3	13.0	12.4	32.9
Liaohe	2.8	23.6	22.6	24.5	7.5	18.9
Provincial rivers: a) Zhejiang and Fujian	2.4	40.8	45.6	7.2	3.2	0.8
b) Northwest	12.9	77.4	6.4	1.6	1.6	-
c) Southeast	-	79.4	15.9	3.2	-	1.6

Source: own work based on: The 2017 Report on the State of the Ecology and Environment in China, op.cit., p. 17–26.

Water shortage is one side of the coin.[124] The other side is water quality, which is predominantly poor. The best example of this is an inspection of 13,000 km of the Yellow River (Huang He) and its tributaries, carried out in 2007 by a specially appointed government commission. The investigation found that one third of the waters of this river are not even suitable for irrigation of agricultural crops, let alone for consumption. 40 % of the water is contaminated. In addition, one fifth of the rivers are so polluted that they fall under the highest category of contamination (V+), which means that the water's toxicity is so high that it presents a

123 Ministry of Ecology and Environment the People's Republic of China, National Standards of the People's Republic of China. Environmental Quality Standards for Surface Water, http://english.mee.gov.cn/Resources/standards/water_environment/quality_standard/200710/W020061027509896672057.pdf, see Łukasz Gacek, *Zielona energia w Chinach*, *op.cit.*, p. 98.

124 Cynthia Cann / Michael Cann / Gao Shangquan, *China's Road to Sustainable Development* [in:] Kirsten A. Day (ed.), *China's Environment and the Challenge of Sustainable Development*, Routledge, New York–London 2005, p. 5–7.

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risk even if a person comes into fleeting contact with it.[125] Groundwater quality is similarly abysmal. According to Chinese research, 50 % of the country's groundwater is contaminated,[126] whereas the World Bank argues that it is 90 %. The most frequently cited groundwater contamination estimate is 80 %.[127] This results in a situation where around 300 million Chinese citizens have no access to clean drinking water.[128] The fact that a country populated by one fifth of the world's population controls only 7 % of the world's water resources epitomizes the scale of the problem. Hence, access to drinking water in China is not only a question of quality of life, but also of survival.

The problems presented above overlap with very poorly developed water transport infrastructure and many years of neglect in the area of constructing and expanding water and sewage infrastructure. Out of 667 large cities, as many as 300 have no sewage treatment plants.[129] At the same time, it is worrying that only 40 % of the water used in industry is treated, which means that the rest is discharged directly into rivers and lakes. 'Water productivity' (yield per unit of water used) is also low, amounting to around 8 USD per cubic meter in China, whereas the average productivity for European countries is around 58 USD. This may be due to the centrally regulated (and therefore not free-market) price of water supplied to the population of Chinese cities, which costs 10 % of the price paid in Europe's large cities.

The scale of degradation of the natural environment (this time in relation to the rest of the world) is underscored by the emission of both particulate matter and toxic chemical compounds to the atmosphere as a result of rapid and uncontrolled economic development in the Middle Kingdom (Table 4). The data on greenhouse gas emissions leaves no doubt as to which country is currently the largest emitter of these gases in the world.

The occurrence of the so-called greenhouse effect, which results from the release of significant amounts of carbon dioxide into the atmosphere, deserves special attention in this context. If the results of scientific research are correct, it is these emissions to the atmosphere that are significantly contributing (and will

125 Water shortage, pollution threaten China's growth, http://www.china.org.cn/environment/2012-02/16/content_24653422.htm.

126 Kaiman Jonathan, *China says more than half of its groundwater is polluted*, "The Guardian", April 23, 2014, https://www.theguardian.com/environment/2014/apr/23/china-half-ground water-polluted.

127 Deng Tingting, *In China, the water you drink is as dangerous as the air you breathe*, "The Guardian", June 2, 2017, https://www.theguardian.com/global-development-professionals-network/2017/jun/02/china-water-dangerous-pollution-greenpeace.

128 Dermot O'Gorman / Zhu Chunquan, *Environment* [in:] Stanley Crossick / Etienne Reuter (ed.), *China-EU: A Common Future*, World Scientific Pub, Singapore–New York–London 2007, p. 20.

129 Tomasz Kamiński, *Sypiając ze smokiem: Polityka Unii Europejskiej wobec Chin*, Wydawnictwo Uniwersytetu Łódzkiego, Łódź 2015, p. 119.

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Table 4.[a] Greenhouse gas emissions in China in 2010 compared to selected countries (million tons per year)

Area	Emissions (millions of tons)	Emissions (percenage)
World	49,503.1	100.0
China	10,740.3	21.7
USA	6,656.4	13.5
Russia	2,491.9	5.0
Japan	1,356.4	2.7
Germany	942.8	1.9
Poland	433.4	0.9

Source: International Energy Agency, *CO_2 emissions from fuel combustion* (2012 Edition). Part III: Greenhouse-Gas Emissions, 2012, p. 46–51, https://www.pbl.nl/sites/default/files/cms/publicaties/PBL_2012-International-Energie-Agency-CO2-from-fossil-fuel-combustion-ed-2012-PART-III.pdf

[a]According to the International Energy Agency's methodology, CO_2 (carbon dioxide), CH_4 (methane), N_2O (nitrous oxide), and fluorinated gases are considered greenhouse gases.

continue to contribute) to the increase in the Earth's temperature and responsible for other changes to the climate.[130] Without entering into a discussion on how undisputed a fact this is and to what extent humanity is responsible for this adverse phenomenon (on the global rather than the regional level, of course), it should be stated that the human activity discussed here is certainly not favorable to its mitigation. Although the decarbonization process – applied on a global scale as the main 'cure' for GHG emissions – has also been on China's green agenda (Chart 1), we should recall that, according to official pronouncements, we can expect the Middle Kingdom to only start reporting a decreasing share of GHG emissions after 2030.

China's levels of sulfur dioxide (SO_2) emission, which are one of the highest in the world, does not help to protect the environment either. These emissions are particularly dangerous due to the fact that sulfur dioxide and sulfur trioxide (SO_3), nitrogen oxide (NO), hydrogen sulfide (H_2S), carbon dioxide (CO_2), and hydrogen chloride (HCl) are all combined with water through precipitation, which produces acid rain.[131] Although these rains are the result of human activity in China, they fall not only in the north-eastern or south-eastern provinces of this country, but also in South Korea and the western part of Japan. After all, this kind of air pollution does not recognize national borders.

130 Texas A&M University, *Air pollution from Asia affecting world's weather*, Science Daily, January 21, 2014, www.sciencedaily.com/releases/2014/01/140121130034.htm; Wang Yuan / Zhang Renyi, *Asian pollution climatically modulates mid-latitude cyclones following hierarchical modelling and observational analysis*, "Nature Communications" 5 (2014), p. 1–7.

131 Hao Jiming / He Kebin / Duan Lei / Li Junhua / Wang Litao, *Air pollution and its control in China*, "Frontiers of Environmental Science & Engineering in China" 2 (2007), p. 129–142.

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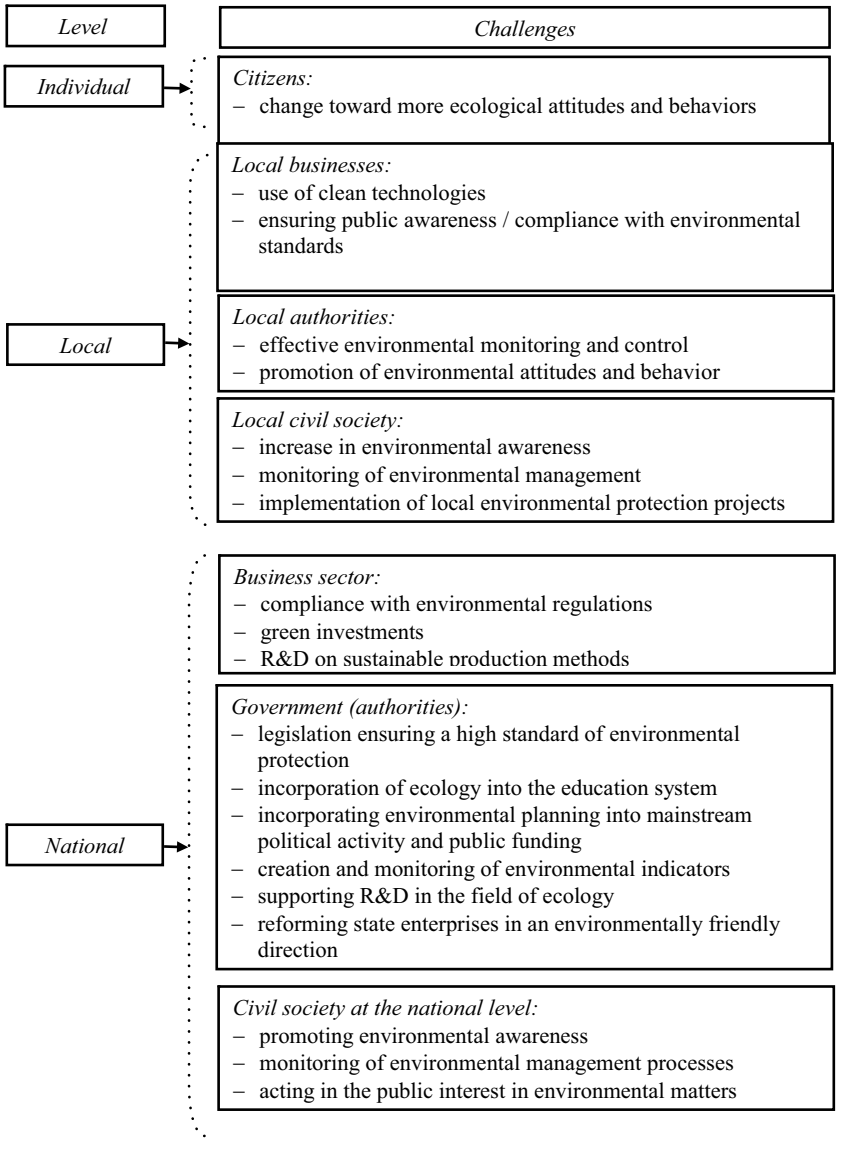
Chart 1. Key actors and environmental policy challenges in China



Source: own work based on: The World Bank, *Cost of pollution in China. Economic Estimates of physical Damage*, Washington 2007, p. 13; Alex Wang, *Chinese state capitalism and the environment* [in:] Curtis Milhaupt / Benjamin Liebman (ed.), *Regulating the Visible Hand? The Institutional Implications of Chinese State Capitalism*, Oxford 2015, p. 15–52.

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3. The administrative and legal dimensions of China's environmental policy

The primary instruments[132] of China's environmental policy (though not the only one)are the legal tools means by which the authorities require or mandate certain behaviors among private or public persons and institutions.[133] The best evidence that the legislation of the Middle Kingdom with regard to environmental protection is changing are the alterations made to various legal foundations underlying it (including Chinas' constitution). All of them lead (or at least are intended to lead) to improved environmental standards and the expansion of environmental considerations into new areas of life. This is important because, in a country where broad pro-ecological attitudes have not yet emerged,[134] it remains difficult to talk about adequate progress without appropriate formal and legal means to buttress it. Nevertheless, while formal legal decisions constitute the crux of environmental policy, they cannot be fully identified with it, let alone replace it. This is mainly due to the fact that legislation adopted by the central government is implemented at the regional and local levels, thus becoming subject to regional or local interpretation.

This leads to the conclusion that legal measures are a necessary but certainly not sufficient instrument to implement environmental policy in China. If we limit our scope to legal instruments and China's practices of implementing them, one of the most notable aspects is the fact that they are respected at every level of environmental policy management, i. e. central, regional, and local. As a result, Chinese legislation, though appealing on paper, encounters implementation difficulties in practice, especially at the level of local administrative structures.[135] Furthermore, according to a review conducted by Wang Jin, China possesses a plethora of legal instruments pertaining to environmental protection at various legislative levels – except that, since they cover almost every aspect of environmental management, they are legislative measures of low quality, with too many diluted standards, a very basic scope, and serious challenges to enforce ability.[136]

132 See Sonh Meihua / Zhang Shi-jun, *A Discussion to the framework of the new system of investment and financing on environmental protection of our country*, "Contemporary Manager" 10 (2006).

133 Michael Howlett, *Designing Public Polices: Principles and Instruments*, Routledge, London–New York 2011, p. 84.

134 Oskar Weggel, *China*, *op.cit.*, p. 173.

135 Liu Jianqiang, *China's new environmental law looks good on paper*, https://www.chinadialogue.net/blog/6937-China-s-new-environmental-law-looks-good-on-paper/en.

136 Wang Jin, *Thirty Years' Rule of Environmental Law in China: Retrospect and Reassessment*, "Journal of China University of Geosciences" (Social Sciences Edition), 2009, p. 3–9 (in Chinese). As cited in: Jin Yana / Henrik Andersson / Zhang Shiqiu, *Air Pollution Control Policies in China: A Retrospective and Prospects*, "International Journal Environmental

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Any analysis of China's environmental policy – understood as the set of instruments intended to achieve the country's environmental objectives – must start with the 1982 Constitution of the People's Republic of China (中华人民共和国宪法).[137] Environmental issues are directly referred to in Article 9 of the Constitution, which conveys the central government's disposition regarding the rational use of natural resources and protection of rare animals and plants. At the same time, this regulation states that all elements of the natural environment are property of the state. These include mineral resources, water, forests, mountains, meadows, wastelands, beaches, and other natural resources, with the exception of forests, mountains, meadows, wastelands, and beaches that are already the legal property of collectives. All legal entities and natural persons are prohibited from disturbing or destroying natural resources. This unequivocally proves that it is the state that is entrusted with both governing natural resources and protecting the environment.

Land remains one of the most important environmental resources. Lawmakers have put the state in charge of its use. "Land in the rural and suburban areas is owned by collectives except for those portions which belong to the state in accordance with the law; house sites and privately farmed plots of cropland and hilly land are also owned by collectives. The State may, in the public interest and in accordance with the provisions of law, expropriate or requisition land for its use and shall make compensation for the land expropriated or requisitioned. No organization or individual may appropriate, buy, sell or lease land or otherwise engage in the transfer of land by unlawful means. The right to the use of land may be transferred according to law."[138] The legislation points out that all legal and natural persons using a tract of land must ensure its rational use, although the Constitution does not explain the meaning of that term.

Article 22 of the Constitution refers directly to the natural environment as the environment of all Chinese citizens, subject to legal protection. It is therefore the responsibility of the state to prevent pollution and other public hazards as well as to encourage afforestation and protection of forests. Nevertheless, the regulations outlined in the Constitution amount to a fairly general definition of the principles of environmental protection. Thus, the principle of prevention can be induced from Article 9 of the Constitution, which prohibits the appropriation or destruction of natural resources by any legal or natural person. This regulation may be an embodiment of the principle of prevention – but not entirely. It is

Research and Public Health" 13 (2016), p. 6–7, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5201360/pdf/ijerph-13-01219.pdf.

137 Zhonghua renmin gongheguo xianfa (中华人民共和国宪法), Zhongyang zhengfu menhu wangzhan (中央政府门户网站), March 11, 2018, http://www.gov.cn/guoqing/2018-03/22/content_5276318.htm.

138 *Ibidem*, Article 10.

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difficult to find regulations at the constitutional level to corroborate the conscious application of the principle of responsibility of the perpetrator or accomplice. This supports the thesis that this principle does not apply to the state and its bodies. Conversely, this is a fundamental issue in the constitutional order of the European Union member states.[139]

The aforementioned transformation of the law in the field of environmental protection also includes decisions in the domain of civil law. This body of law too reflects a conscious response to environmental problems, which is referred to as the "greening of civil law". Its main principle is that private entities should contribute to the protection of resources and the environment in civil activities (the so-called green principle). Zhai Tiantian and Chang Yen-Chiang point out that the implementation of the green principle in civil law contributes to further efforts to protect the environment and natural resources. This is because the principle should be taken into account in legal provisions relating to the validity, effectiveness, and interpretation of agreements, as well as in rules pertaining to emissions trading agreements.[140]

Environmental protection issues are regulated by the Environmental Protection Law of the People's Republic of China (中华人民共和国环境保护法) of December 26, 1989.[141] The wording of Article 1 of that law leaves no doubt that the protection of the environment is an inherent part of "socialist modernization" with a view to further developing the Chinese economy – as are improving the living conditions of the population, preventing and controlling pollution and other public risks, and protecting public health. In the spirit of this objective, environmental policy is based on environmental protection plans, which must form part of national socio-economic development plans. It is the task of the state to conduct an economic policy that considers the factors that are conducive to environmental protection (Article 4). Pro-economic and pro-environmental measures are integrated in this way, with the caveat that the inclusion of environmental plans in economic development plans is an example of the preponderance of the latter over the former.

When analyzing the law in question, it is impossible to ignore Article 13, which provides for a preventive instrument in the field of environmental protection, i. e.

139 Jan W. Tkaczyński, *Prawo i polityka ochrony środowiska środowiska Unii Europejskiej*, Wydawnictwo Naukowe PWN, Warszawa 2009, p. 75–82.

140 Zhai Tiantian / Chang Yen-Chiang, *The Contribution of China's Civil Law to Sustainable Development: Progress and Prospects*, "Sustainability" 11 (2019), p. 1.

141 Interestingly, the law was put to trial as early as 1979. The 1989 version has been amended several times – for instance, in 2007 and 2014. Zhonghua renmin gongheguo huanjing baohu fa (中华人民共和国环境保护法), Zhongguo renda wang (中国人大网), December 26, 1989, http://www.npc.gov.cn/wxzl/gongbao/1989-12/26/content_1481137.htm; Jin Yana / Henrik Andersson / Zhang Shiqiu, *Air Pollution Control Policies in China…*, *op.cit.* p. 6–7.

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the environmental impact statement. In a sense, this is a solution drawn from European practice and commonly referred to as an Environmental Impact Assessment (EIA). In the case of an investment project, the declaration includes an assessment of the pollution that its implementation may inflict on the environmental field. The assessment is submitted to the relevant authority (depending on the characteristics of the administrative level), which considers granting permission for the investment work in question. Construction plans cannot therefore be adopted without prior approval for the environmental impact statement.[142]

The 2014 amendment to the aforementioned law expanded its scope from 44 to 70 articles and not only brought about a greater degree of responsibility for environmental matters on the part of local authorities, but also includes regulations for improving the environmental monitoring system and mechanisms to assess the impact of pollution on the health of the population. At the same time, the penalties for breaching the applicable environmental standards have been tightened. For example, company directors who do not comply with established standards may be imprisoned. Officials who cover up environmental deficiencies face similar repercussions and may be demoted or even removed from office.[143]

The institutional environmental protection system that emerges from the Environmental Protection Law of the People's Republic of China is of a hierarchical nature (Chart 2), even though the law also contains regulations that encourage networked governance of the policy in question. In Chapter II ("Supervision and management of the environment"), the law leaves no doubt that environmental standards are set by the appropriate ministry with a mandate for environmental protection. Thus, the provincial, autonomous regions and municipalities may set their own standards, but only for those environmental resources for which the central government has not set standards itself. The same applies to the discharge of pollutants (Article 10) and the monitoring system (Article 11). Therefore, it is the task of the administrative units at or above the county level, together with the relevant authorities, to control and assess the environmental situation in their areas of competence. They are also responsible for drawing up environmental plans, which are subject to approval by authorities at the appropriate echelon before they are implemented.

On the local level, the local head of the Communist Party of China plays a unique and thus very important role. Its significance stems from the fact that it is this official who determines the distribution of funds among different bureaus in regional and local structures (provincial, prefectural, county, and municipality-level bureaus) and makes decisions on staffing changes. Since these are largely

142 *Ibidem*, Article 13.
143 Łukasz Gacek, *Zielona energia w Chinach*, *op.cit.*, p. 69.

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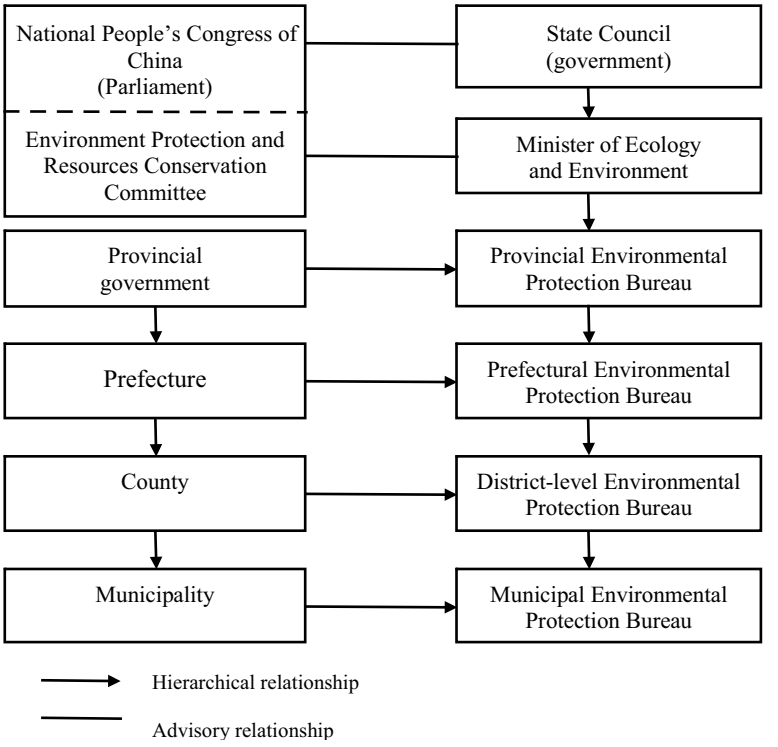
Chart 2. Institutional relations in the Chinese environmental policy system



Source: own work based on: Chen Gang, *Politics of China's Environmental Protection: Problems and Progress*, Singapore 2009, p. 21.

driven by the promotion of local officials (a type of staff evaluation[144]), the local Party head's limited attention and compromises in the allocation of funds are naturally dependent on the incentives resulting from the mechanisms of promotion. The promotion of local officials in China is a kind of human resource assessment linked to the implementation of the Five-Year Plans, which consist of a number of socio-economic initiatives.[145]

It can be argued that environmental policy in China is shaped at four levels (Chart 3). The first three are the different levels of activity of public institutions whose task is to formulate and implement policy (initiators). The fourth can be called the individual level, comprising residents and entrepreneurs (targets). The

144 Genia Kostka, *China's Local Environmental Politics* [in:] Eva Sternfeld (ed.), *Routledge Handbook of Environmental Policy in China*, Routledge, London–New York 2017, p. 36–39.

145 Jin Yana / Henrik Andersson / Zhang Shiqiu, *Air Pollution Control Policies in China…*, *op.cit.*, p. 6.

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management system for environmental policy is therefore horizontal and field-specific. At each echelon of this multi-level policy management system, institutions specializing in environmental protection are established. It should be noted that, in addition to these institutions, relevant organizational units of the authorities at any given level also deal with environmental issues, depending on their competencies and the nature of the issue in question within the environmental policy framework.

At the initiators' level, China's environmental policy is shaped in the central (government, ministries), regional (provinces), and local (prefectures, counties, municipalities) dimensions. The central dimension comprises the relevant ministries, headed by the Ministry of Ecology and Environment. At the provincial level, environmental bureaus with jurisdiction over the province and other environmental institutions are the primary actors involved. Finally, the local level is composed of local environmental protection bureaus and other government offices with competencies in the relevant areas whose jurisdiction is appropriate for that administrative level. The fourth dimension of the implementation of China's environmental policy that we can distinguish is the individual level (policy targets), which refers to individual entities affecting the natural environment, i. e. entrepreneurs or residents (Chart 3).[146]

At the central level, power is held by the Ministry of Ecology and Environment, which has been operating in its current iteration since 2008, when the state environmental protection administration was transformed into a ministry forming an integral part of the government (State Council). Until then, it had been an institution affiliated with the government and responsible for environmental issues. The main objectives of the Ministry include establishing and coordinating the environmental protection system of the Middle Kingdom.[147] Hence, it cooperates with other ministries in initiating, formulating, and implementing national environmental protection plans, prepares draft laws, and drafts executive acts. The regulatory instruments that apply to this ministry includes legislation on air, water, sea, and soil pollution as well as its other forms, including pollution stemming from noise, light, odor, solid waste, chemicals, and vehicles.

At the same time, the ministry is responsible for formulating and managing land use plans for key regions, river basins, sea areas, and sources of drinking water. It also establishes ecological standards and specific technical requirements related to environmental protection. One of the institution's important tasks is to initiate and coordinate investigations into serious environmental incidents. In

146 *Ibidem.*

147 Ministry of Ecology and Environment of the People's Republic of China, *Mandates*, http://english.mee.gov.cn/About_MEE/Mandates/.

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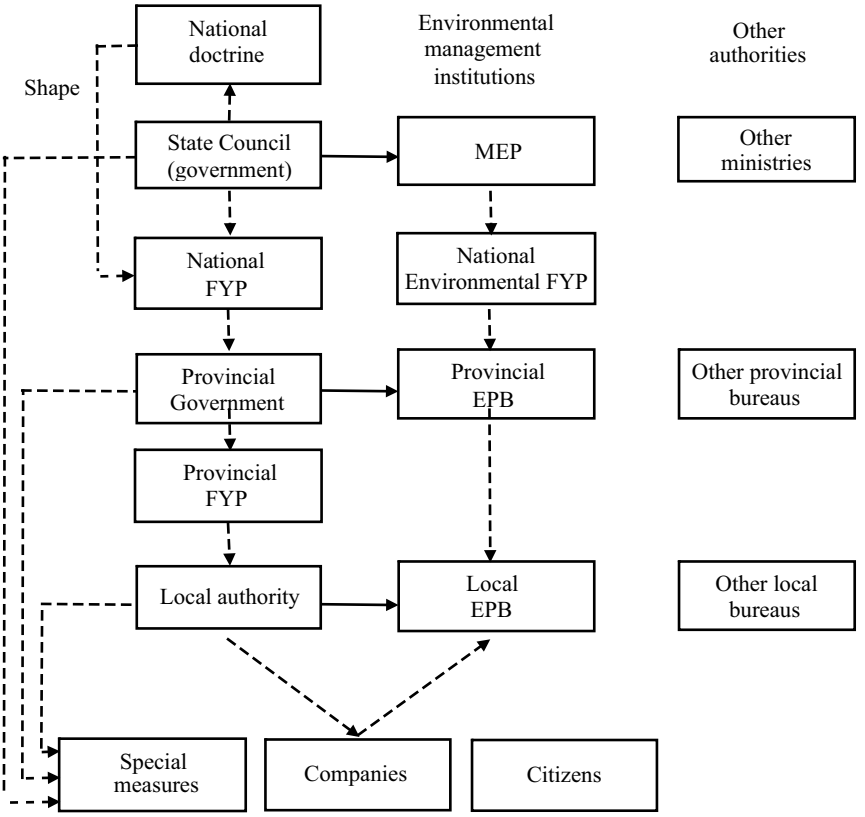
Chart 3. China's environmental policy management system



FYP – Five-Year Plan
MEP– Ministry responsible for the environment. Current official name: Ministry of Ecology and Environment
EPB – Environmental Protection Bureau

Source: own work based on: Jin Yana / Henrik Andersson / Zhang Shiqiu, *Air Pollution Control Policies in China: A Retrospective and Prospects*, "International Journal of Environmental Research and Public Health", December 13 (2016), p. 5.

addition, it coordinates and directs the activities of local authorities in the field of emergency response and early warning when serious environmental incidents occur. Under the authority of the central government, the ministry has the task of monitoring and controlling the implementation of the national environmental protection strategy by local governments and regional entities. As it has the power to determine the necessary investments in the environmental sector and to estimate their costs, it has the prerogative to approve investment projects in accordance with the relevant master plans and annual plans. The Ministry has

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

also been entrusted with tasks related to the monitoring of the state of the natural environment, including pollution sources, the reduction of greenhouse gas emissions, and other forms of emergency monitoring. No less important is the institution's duty to formulate and coordinate informational and educational campaigns on environmental protection.[148]

The implementation of activities resulting from the Five-Year Plans is administratively commissioned to local governments; environmental protection is no different. The administration pursues its objectives and is evaluated on the basis of the tasks assigned, which determines whether or not a particular official is promoted. Initially, the staff evaluation system was used to assess the performance of officials in areas such as economic growth and birth control.[149] This relegated environmental objectives at the local level to a secondary position relative to economic development or social stability.[150] Certain achievements in the field of environmental protection, starting with the 11th Five-Year Plan (2006–2011), are attributed to the system of top-down assessments of local structures, which was introduced at that time. The evaluation established priorities and quantitative environmental objectives to mobilize governors, mayors, and directors of state-owned enterprises. This has resulted in a number of important environmental measures, particularly in terms of investment in infrastructure and pollution control, leading to the closure of thousands of obsolete facilities and production lines.[151]

As mentioned previously, environmental protection is the ultimate goal of tasks handed down from higher to lower levels. In practice, the activities that are subject to an official evaluation system (defined as special measures in Chart 3) are the ones that are usually implemented effectively. This enables officials to draw the attention of local leaders to environmental issues, especially those considered to be crucial (urgent and serious); lack of progress in resolving translates into lack of options for promotion. In contrast, the 'normal' operations of both provincial and local (self-governing) environmental protection offices are characterized by a certain level of organizational independence and do not typically produce adequate results. This is mainly because these offices have limited capacity for such critical activities as monitoring and enforcement (in-

148 Ministry of Ecology and Environment of the People's Republic of China, *op.cit.*

149 Li Mei, *The reform of public service units in China: A decentralization approach* [in:] Ishtiaq Jamil / Salahuddin M. Aminuzzaman / Sk. Tawfique M. Haque (ed.), *Governance in South, Southeast, and East Asia Trends: Issues and Challenges*, Springer, Heidelberg–New York–Dordrecht–London 2015, p. 191–208.

150 Alex Wang, *Chinese state capitalism and the environment* [in:] Curtis Milhaupt / Benjamin Liebman (ed.), *Regulating the Visible Hand? The Institutional Implications of Chinese State Capitalism*, Oxford University Press, Oxford 2015, p. 15–52.

151 Alex Wang, *The Search for Sustainable Legitimacy: Environmental Law and Bureaucracy in China*, "Harvard Environmental Law Review" 365 (2013), p. 374, 412–417.

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cluding oversight and audits) of the state of environmental protection due to financial and staffing constraints.[152]

As long as activities related to environmental protection are measured in a way that does not allow the results to be easily circumvented by fabricating or manipulating data,[153] local officials are obliged to actually implement environmental regulations. Apart from the fear for one's own career, the strong political pressure from the central government is also important. However, the local practice of implementing the policy discussed here indicates that local clerks often falsify information and sabotage measuring equipment used to control pollution levels. In addition, the factories that are closed down due to failure to comply with environmental regulations are later furtively reopened (state-owned enterprises are the main source of environmental pollution among economic entities in China[154]).

In this context, those governance reforms that lead to strengthened public oversight of compliance with environmental standards are particularly important. They all contribute to resolving institutional pathologies that limit the effectiveness of environmental protection efforts.[155] These pathologies can be encapsulated in two Chinese sayings: "Heaven is high and the emperor is far away" and "Where there is a decree from above, there will be a countermeasure from below". These 'countermeasures' do not so much explain the low level of compliance with environmental standards in Chinese environmental practice as they are among the greatest obstacles to the local implementation of the policy discussed here.

4. China's administrative and legal toolbox and environmental challenges to dynamic development

A careful look at the means by which environmental policy is implemented in China indicates the use of a diverse catalogue of instruments to achieve its objectives. If environmental policy follows the general principles of public policy, the success of each instrument is determined by its capable application at the appropriate level of competence so as to ensure that the execution of the objectives

152 Jin Yana / Henrik Andersson / Zhang Shiqiu, *Air Pollution Control Policies in China…*, *op.cit.*, p. 6.

153 Chen Yuyu / Jin Ginger Zhe / Naresh Kumar / Shi Guang, *Gaming in air pollution data? Lessons from China*, "The B.E. Journal of Economic Analysis & Policy" 3 (2012), p. 6–11, 35.

154 Alex Wang, *Chinese State Capitalism and the Environment*, *op.cit.*, p. 7–11.

155 Alex Wang, *The Search for Sustainable Legitimacy: Environmental Law and Bureaucracy in China*, *op.cit.*, p. 11–31.

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pursued is optimized accordingly.[156] This perspective is underscored in the references to the following instruments in Chinese environmental policy (see Chart 3):
1) the doctrine of the state, which includes the idea of environmental protection;
2) environmental law and its standards;
3) Five-Year Plans and associated strategy papers;
4) conventional regulatory measures;
5) special actions taken outside the Five-Year Plan.

The state's environmental doctrine in China is an example of the transformation of the government's political position regarding the importance of environmental issues. It is indisputable that, since Xi Jinping took the reins of power in 2012, China's environmental image has improved significantly. Analysts often commend the determination of the authorities to act to reverse the degradation of the environment in the Middle Kingdom. The initial phase of the 'green transformation' in Chinese politics was partly triggered by the new constellation of actors contributing to environmental management. This is obviously effective on a reputational level, but it is hard to deny that stopping at declarations will make enforcing the law impossible in the long run.[157] To some extent, therefore, the Party's pro-ecological doctrine is a kind of litmus test of the extent to which authoritarian regimes are able to respond to citizens' demands/expectations.

There is no doubt that (lack of) success in the field of environmental protection is strongly determined by the field's political dimension, i. e. the system of dependencies in the multi-level management of the country's environmental protection policy. Equally important is this dimension's impact on society. Both aspects are critical because China is an example of a unitary, centralized state where power is attributed to a very large authority. The doctrine of the state, expressed through demands or slogans such as 'sustainable development,' 'clean production,' 'green GDP,' 'harmonious society,' 'low-carbon economy,' and 'green civilization,' plays an important role in this respect. All of these manifestations are meant to illustrate political consensus at the highest levels of government and to point the architects of central planning in the desired direction in the implementation of environmental strategies. In fact, the relationship between the central and local governments in China is much more complex than the concept of a unitary state might suggest. Central planning is accompanied not only by local implementation, but also by local resistance, whether in the form of inertia and inaction against the expectations of the center or competition between local governments for invest-

156 Marek Świstak, *Polityka regionalna Unii Europejskiej jako polityka publiczna. Wobec potrzeby optymalizacji publicznego działania*, Wydawnictwo Uniwersytetu Jagiellońskiego, Kraków 2018, p. 136.

157 Genia Kostka / Zhang Chunman, *Tightening the grip: environmental governance under Xi Jinping*, "Environmental Politics" 27 (2018), p. 769–781.

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ment. Nevertheless, the central government plays a leading role in efforts to solve environmental problems.[158]

The latest and youngest slogan for China's environmental program so far – "the ecological civilization," – is especially interesting in its approach to promoting environmental protection in the public space. This concept, which has been present in the party nomenclature since 2007, refers to an attempt to combine economic growth with environmental protection requirements. The aim is to reduce environmental degradation and, at the same time, strengthen the environmental management system to support progress in the field. The government places special emphasis on green development based on low-emission solutions, increasing the role of science and advanced technological innovations in shaping the 'ecological civilization,' rational management of the manufacturing space, the dissemination of ecological culture by promoting ecological and healthy lifestyles (i. e. specific consumption patterns and increasing public awareness in this respect), rational and more efficient use of resources, the inculcation of energy-saving measures into social mores, improving the quality of the natural environment by reclaiming and recultivating degraded areas, bolstering administrative procedures and institutional support, as well as strengthening of the system of control and oversight of compliance with the law on environmental protection.[159]

Environmental law constitutes another instrument for implementing the country's environmental policy. As legislation has already been mentioned, we should merely add that the environmental protection system has a number of legal provisions at different legislative levels. Broadly, the transformation of Chinese environmental law has been heading towards raising individual standards, although it is not limited to that. For example, there are standards for coal-fired power plants, coal-fired boilers, vehicle exhaust emissions, and air quality. Some standards in this area that were originally established in the 1980s were relaxed around 2000. It was not until the PM2.5 pollution crisis, which seriously affected a large part of the country in winter 2012/2013, that these standards were updated and significantly improved. The current standards are largely in line with their international counterparts.[160]

158 Oran R. Young et al., *Institutionalized governance processes: Comparing environmental problem solving in China and the United States*, "Global Environmental Change" 31 (2015), p. 165–167.

159 Łukasz Gacek, "*Cywilizacja ekologiczna*" *w współczesnych Chinach: polityka ochrony środowiska w postulatach strategii zrównoważonego rozwoju* [in:] Joanna Marszałek-Kawa (ed.), *Perspektywy i bariery rozwoju chińskiej gospodarki*, Wydawnictwo Adam Marszałek, Toruń 2016, p. 76–77.

160 Jin Yana / Henrik Andersson / Zhang Shiqiu, *Air Pollution Control Policies in China…*, *op.cit.*, p. 7.

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Environmental planning in China is inextricably linked to the Five-Year Plans and forms the primary policy instrument used for environmental management. The Five-Year Plans, developed on the basis of Article 89 of the PRC Constitution,[161] provide a link between the state's environmental doctrine and legal codification in this area. This is primarily because the Five-Year Plans are based on guidelines adopted by the Central Committee of the CPC while reflecting the views of the CPC leadership. Formally, this document is verified by the government (State Council) and then adopted by the Parliament, i. e. the People's Congress of the PRC.[162] Since the 6th Five-Year Plan, environmental issues have become part of separate chapters and are becoming more and more important in subsequent editions of the plans. This is a step in the right direction, as the more the importance of environmental issues in national planning is emphasized, the greater the chance that they will be quantified and supported by sectoral equivalents of the Five Year Plans, also at the local level.[163]

The main objectives of the Five-Year Plans in the field of environmental planning are increasingly to define acceptable standards of pollution (e. g., sulfur dioxide, nitrogen oxide, carbon dioxide). From the systemic point of view, it is worth recalling that the central government delegates the implementation of the adopted objectives to lower-tier government institutions. It does so by means of directives in which it not only defines the metrics to evaluate a given measure, but also assigns resource allocations to specific objectives while transferring the responsibility for their implementation to the administrative units concerned. In this way, the Five-Year Plans have become the instrument by which central requirements are transposed to the local level in the field of environmental action. However, since finding an optimal and efficient division of responsibilities is a common challenge facing environmental policy worldwide,[164] it is worth stressing that the local dimension remains crucial in China.[165]

Although the Five-Year Plans are not formally a source of universally applicable law, in practice they are still vested with great executive power. The importance of this observation is non-trivial, as it allows us to determine the scale of application and enforcement of the environmental requirements contained in consecutive editions of the Five-Year Plans (Table 5). The city of Dalian, which included an environmental component in its own Five-Year Plan, exemplifies the

161 Zhonghua renmin gongheguo xianfa (中华人民共和国宪法), *op. cit.*

162 Oran R. Young et al., *Institutionalized governance processes…*, *op. cit.*, p. 165.

163 Jin Yana / Henrik Andersson / Zhang Shiqiu, *Air Pollution Control Policies in China…*, *op.cit.*, p. 8.

164 Michael E. Kraft, *Environmental Policy and Politics*, *op.cit.*, p. 82–83.

165 Dan Guttman / Song Yaqin, *Making central-local relations work: Comparing America and China environmental governance systems*, "Frontiers of Environmental Science & Engineering in China" 4 (2007), p. 425–429.

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fact that we can attribute the same power to the Plans as we do to national law.[166] However, the Plan (and the associated requirements regarding responsibility and liability) is not functionally law, as it is not possible to enforce its implementation by citizens or NGOs.

Table 5. Actions by goal: support for ecosystems and the environment in the 13th Five-Year Plan (2016–2020)

Axis	Actions / Priorities
Accelerating the development of functional zones	– Creation of functional zones – Development of rules for functional zones – Development of spatial management systems
Promoting economic efficiency and efficient use of resources	– Energy conservation – Promoting water conservation in society – Environmentally efficient land use – Conservation and management of mineral resources – Rationalizing the circulation of resources in the economy
Enhancing comprehensive environmental management	– Pollution prevention and management action plan – Compliance with emission standards and cumulative reduction of emissions – Environmental risk prevention and control – Development of environmental infrastructure – Reform of basic environmental management systems
Strengthening ecological protection and regeneration	– Improving ecosystem services – Ecological regeneration in key regions – Ensuring a consistent supply of ecological goods – Protection of biodiversity
Responding to global climate change	– Control of greenhouse gas emissions – Adapting to climate change – International cooperation
Improving environmental safety mechanisms	– Ecological and environmental systems – Monitoring of ecological and environmental risks, early warning, and emergency response
Development of an eco-friendly industry	– Environmentally friendly products and services – Environmental technology and equipment

Source: own study based on: The 13th Five-year Plan for Economic and Social Development of the People's Republic of China (2016–2020), National Development and Reform Commission, December 7, 2016, https://en.ndrc.gov.cn/policyrelease_8233/201612/P020191101482242850325.pdf

166 *Ibidem*, p. 423.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

Conventional regulatory approaches include ten concrete measures adopted in recent decades that are fundamental for environmental management in China. The first, second, and third comprise the so-called old legislation (1972–1979), while the fourth to the eighth constitute the new legislation (1980–1989). The ninth and tenth measures are included in the latest generation of regulatory instruments. In brief, one or more of the following instruments are used to implement environmental legislation in China[167]:

1) Environmental Impact Assessment (EIA) of construction projects: for construction projects, an EIA is carried out before construction begins. In 2003, this measure was extended to EIA planning.
2) 'Three simultaneous investments': the pollution prevention and control mechanisms in a construction project must be designed, built, and implemented in tandem with the main part of the project.
3) Pollution fees: when pollution discharge exceeds preset standards, the responsible entity pays an excess discharge fee. Since 2003, pollution fees have been levied for all discharges and are not limited, as before, to excessive discharges.
4) Comprehensive quantitative evaluation of the urban environment: a system of weighted metrics with indicators covering all aspects of environmental protection, the results of which are published annually for about one hundred cities.
5) Pollution discharge permits: the polluting entities (e.g. companies) discharge pollutants in accordance with the relevant permits. Certificates validating pollution discharge permits are issued by the Environmental Protection Bureau (EPB).
6) Remedying damage within a prescribed period: the administrative authorities issue decisions according to which corporate actors found guilty of severe pollution are obliged to remedy the damage within a prescribed period.
7) Centralization of pollution control: investments that contribute to environmental protection in a given area are jointly planned, designed, and operated as complementary investments.
8) Cleaner manufacturing: Companies will monitor resource consumption and waste generation during production and, carry out audits of cleaner manufacturing, and report to the relevant local government services.
9) System of responsibility for environmental protection: Local authorities at the county level or above are responsible for environmental protection

167 Jin Yana / Henrik Andersson / Zhang Shiqiu, *Air Pollution Control Policies in China…*, *op.cit.*, p. 8–9.

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within their jurisdiction, and the persons responsible are assessed in this respect as part of a staffing assessment.

10) Total control of greenhouse gas emissions: initially applied for a limited time and to a limited area. It consists in allocating certain emission quotas to local authorities and entrepreneurs. Initially, these were circumscribed to control areas for acid rain and excessive SO_2 emissions; subsequently, the system was extended nationwide.[168]

The last of the environmental instruments in China that are relevant to this analysis are the special measures taken outside the Five-Year Plan. This includes measures in response to all kinds of environmental emergencies (e. g., ecological disasters). They are used when the state of the environment deteriorates, resulting in a drastic decline in citizens' quality of life. Specific actions may temporarily mitigate the ineffectiveness of 'normal' environmental policy instruments deployed under existing legislation. These are usually local, short-term administrative measures taken regardless of financial costs. Sometimes, once the crisis is over, some of these measures are adopted at a regional or national level and even included in subsequent Five-Year Plans. Examples of special measures include environmental inspections to draw the attention of local authorities to environmental protection, the 'Blue Sky' project in Beijing in preparation for the 2008 Olympic Games, and the Action Plan against air pollution caused by PM2.5 particles.[169]

5. Environmental protection in China: Toward a modern environmental policy?

Today, it should come as no surprise that the realization of the state's *raison d'état* – a term rooted in the Renaissance that nevertheless evokes a rather old-fashioned political style – is framed differently than it was in the past. In modern times, the term has been fitted with a new interpretive framework in which the state, while reaffirming its own interests as overriding in relation to all others, supplements this interpretation with an awareness of the existence of *critical national infrastructure*, i. e. resources of fundamental importance for the success of the society and economy of a given country. Article 2 of Council Directive

168 On the emissions trading system, see Hal Harvey / Hu Min, *The China carbon market just launched, and it's the world's largest. here's how it can succeed*, "Forbes", December 19, 2017, https://www.forbes.com/sites/energyinnovation/2017/12/19/the-china-carbon-market-just-launched-and-its-the-worlds-largest-heres-how-it-can-succeed/#1682b3047ce6.

169 Oran R. Young et al., *Institutionalized governance processes…*, *op. cit.*, p. 166–167.

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2008/114/EC, which is the point of departure for these considerations, defines critical infrastructure as "(…) an asset, system or part thereof located in Member States which is essential for the maintenance of vital societal functions, health, safety, security, economic or social well-being of people, and the disruption or destruction of which would have a significant impact in a Member State as a result of the failure to maintain those functions."[170]

It appears that this multidimensional nature of state security as an interpretation of *raison d'état* has also been recognized in China, since the National Security Act of July 1, 2015 highlights the importance of the following components/systems: political, military, economic, social, financial, nutritional, technological, information, cultural, energy-related, and ecological.[171] Placing ecology last on this list does not change the fact that the future of the Chinese state depends on respect for the environment and its resources. Similarly, its ecological security – a new dimension – is an important component of the sustainable development model, which consists in linking socioeconomic and ecological objectives in a feedback loop. This is how the UN World Commission on Environment and Development sees it, as evidence in a 1987 report in which sustainable development is characterized as the current generation's right to meet its needs without reducing the development needs of future generations.[172]

This cannot be said of the current stage of development in the Middle Kingdom. Without repeating the data presented above, it is worthwhile to refer to the Environmental Performance Index (EPI), published jointly since 2002 by the Yale Center for Environmental Law & Policy (Yale University) and the Center for International Earth Science Information Network (Columbia University). According to this index, in 2018, China ranked 120th out of 180 countries surveyed.[173] It is difficult to interpret these data in any other way than as a clear statement of the fact that environmental protection measures are emerging in China, but we are only in the nascent phase of this transformation. This in turn is indirectly supported by the statistical observation that environmental pollution is becoming a matter of concern for citizens as well, asa report by the Chinese Academy of Social Sciences titled *The Annual Report on China's Rule of Law No. 12 (2014)* discloses that, in the years 2000–2013, there were 871 "mass protests" in the Middle Kingdom (with at least 100 participants), amounting to a

170 Council Directive 2008/114/EC of 8 December 2008 on the identification and designation of European critical infrastructures and the assessment of the need to improve their protection, OJEU L 345/75 of 23 December 2008, https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:345:0075:0082:EN:PDF.

171 Łukasz Gacek, *"Cywilizacja ekologiczna" we współczesnych Chinach…*, *op. cit.*, p. 66.

172 Our Common Future, op.cit.

173 2018 Environmental Performance Index, https://epi.envirocenter.yale.edu/downloads/epi2018policymakerssummaryv01.pdf.

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total of around 2.2 million people. The caveat here is that these protests did not only target pollution and environmental matters. Equally important is the fact that opinion polls show, that despite the stated concern about the state of the environment in society, the same vast majority of respondents are not willing to switch to pro-ecological attitudes.[174]

Meanwhile, the estimated losses resulting from environmental pollution in the Middle Kingdom vary greatly and, depending on the period and institution making the estimation, range from 2.3 % to 10 % of the country's GDP.[175] This is an enormous sum in absolute terms, and it is therefore not surprising that the disrupted state of the environment in China is perceived not only as a mere reflection of the negative impact of years of unfettered economic development on the ecosystem, but also as an emerging, serious threat to the dynamics of China's further development. The development of the Chinese economy without regard for environmental protection and respect for biodiversity has had severe repercussions. On the one hand, it has given the Middle Kingdom an economic advantage in the form of reduced investment costs compared to the standards adopted in Europe. On the other hand, disregard for environmental protection in the investment process has brought not only profits in the form of increased prosperity, but also costs, as it reduces the chances for future generations to develop and has triggered a drastic deterioration in the quality of life of Chinese citizens.

World Bank estimates from 2007 (Table 6) leave no doubt that, from an economic point of view, the most significant environmental problem in China is air pollution, the cost of which is estimated at less than 3 % of GDP. Using the same criterion, one should also highlight the costs associated with water scarcity, which amount to around 147 billion RMB and account for around 1.1 % of GDP. The scale decreases in crop yield due to acid rainfall, calculated for the whole country in millions of tons, is also striking. The lack of official data does not allow us to assess the full scale of the costs of environmental pollution, and the available government reports do not contain the above-mentioned data.[176] This poses yet another challenge for environmental policy-making, especially if we compare it, for example, with the policy of information openness, as practices under various models in the European Union countries.

174 Łukasz Gacek, *"Cywilizacja ekologiczna" we współczesnych Chinach…*, *op. cit.*, p. 79–80.

175 Maciej Walkowski, *Chińska strategia rozwoju społeczno-ekonomicznego*, *op. cit.*, p. 248–252; Łukasz Gacek, *Zielona energia w Chinach*, *op.cit.*; Alex Wang, *Chinese state capitalism and the environment* [in:] Curtis Milhaupt / Benjamin Liebman (ed.), *Regulating the Visible Hand? The Institutional Implications of Chinese State Capitalism*, Oxford University Press, Oxford 2015, p. 7.

176 The 2017 Report on the State of the Ecology and Environment in China, *op.cit.*, p. 8–54.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

Table 6. The costs of environmental pollution in China according to World Bank estimates (2007)

Cost category	**Area**	**Physical impact**	**Economic impact** (low estimate)[1]	**% of GDP**	**Economic impact** (high estimate)[2]	**% of GDP**
Health costs	mortality due to air pollution	394,000 premature deaths [135,000–628,000] [2]	111 [35.8–179]	0.82 %	394 [136–641]	2.9 %
	diseases due to air pollution, mortality due to water pollution	305,000 cases of chronic bronchitis [266,000–342,000]	46,4 [39.0–53,2]	0.34 %	126 [108–142]	0.93 %
	mortality due to water pollution	14,000 cases of fatal diarrhea 52,000 deaths from cancer	9.7	0.07 %	66.2	0.49 %
Non-health costs related to water pollution	water shortages	74 billion m^3 (depleted or polluted water)	147 [95–199]	1.1 %	147 [95–199]	1.1 %
	decrease in crop yields due to irrigation of agricultural land with contaminated water	wheat: 4,463 tons rice: 7,339 tons maize: 62,505 tons vegetables: 560,771 tons	6.7	0.05 %	6.7	0.05 %
	decline in fish catches	1,274 accidents related to pollution of fisheries	4.3	0.03 %	4.3	0.03 %

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Table 6 *(Continued)*

Cost category	Area	Physical impact	Economic impact (low estimate)[1]	% of GDP	Economic impact (high estimate)[2]	% of GDP
Non-health costs related to air pollution	decrease in crop yields due to the occurrence of acid rain	rice: 15.4 million tons wheat: 16.3 million tons rapeseed: 3.6 million tons cotton: 0.6 million tons soy: 3.6 million tons vegetables: 203 million tons	30	0.22 %	30	0.22 %
	material damage due to violent atmospheric phenomena	13.6 billion m^2	6.7	0.05 %	6.7	0.05 %
Total			**361.8**	**2.68 %**	**780.9**	**5.78 %**

[1] Values in billion RMB.
[2] Values corresponding to the 95 % confidence interval in brackets.

Source: own work based on: The World Bank, *Cost of pollution in China. Economic Estimates of physical Damage*, Washington 2007, p. XI–XXX; http://siteresources.worldbank.org/EXTUNITFESSD/Resources/1633787-1196098351543/CoPC_presentation.pdf

The quality of environmental monitoring data is also an important challenge for Chinese environmental policy. The importance of this issue is underlined by the fact that environmental monitoring data are the starting point for environmental management decisions. Thus, the accuracy of the relevant data should be considered crucial. Meanwhile, the reliability of Chinese environmental data is questioned by both domestic and foreign observers. Leaving aside the influence of political factors on the accuracy of Chinese environmental monitoring data, keen observers often point to technical and methodological factors that go into the collection of data (different methods of data acquisition and analysis at individual measuring stations).[177] There are also two dimensions of concern with respect to the reliability of data. First, official monitoring data often seem to

177 Liu Qin, *Clear as mud: How poor data is thwarting China's water clean-up*, "China Dialogue", May 18, 2016, https://www.chinadialogue.net/article/show/single/en/8922-Clear-as-mud-how-poor-data-is-thwarting-China-s-water-clean-up.

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under represent environmental issues compared to other sources. Second, disregarding criticism or treating it as an attempt to discredit China or its leadership is not justified because this criticism comes not only from abroad, but also increasingly from domestic researchers employed by relevant state agencies and research institutes.[178]

As far as non-technical factors are concerned, the activities of individual environmental policy actors as well as the impact of individual instruments are of particular interest. Research[179] shows that a bureaucratic system of incentives, conflicting objectives among individual entities, and the tendency to imbue environmental issues with an ideological bent are potential sources of bias in environmental monitoring processes in China. By way of example, career progress for Chinese officials depends largely on the aforementioned staff evaluation system. The link between sufficiently 'good outputs' and the chances of promotion constitutes a sensitive area for Chinese officials, as they can have a decisive impact on their economic, social, and even political status. Cai Yongshun believes that the pursuit of personal goals by local officials is a factor in the manipulation of statistics.[180] Importantly, concerns about data quality are not limited to environmental issues. In 2013, the U.S.-China Economic and Security Review Commission warned against manipulation and inaccuracies in China's economic statistics reporting system.[181]

China's current leadership has recognized this issue by implementing new measures to strengthen administrative coordination and central government oversight of local authorities. However, this does not change the fact that assessing the reliability of Chinese environmental monitoring reports remains a major challenge for those who use them as a resource. Despite continuous efforts by the Chinese government to strengthen environmental governance, inaccuracies in environmental monitoring data are still ever-present. Promoting full public participation in access to information on environmental quality, as per the European standard, could be an appropriate response. It is undeniable that the lack of broad public participation undermines transparency, thus jeopardizing Beijing's efforts to ensure the accuracy of environmental data.[182]

178 See Keith Bradsher, *China asks other nations not to release its air data*, "New York Times", June 5, 2012, https://www.nytimes.com/2012/06/06/world/asia/china-asks-embassies-to-stop-measuring-air-pollution.html?_r=0.

179 Daniele Brombal, *Accuracy of Environmental Monitoring in China: Exploring the Influence of Institutional, Political and Ideological Factors*, "Sustainbility" 9 (2017), p. 1–18.

180 Cai Yongshun, *Between State and Peasant: Local Cadres and Statistical Reporting in Rural China*, "The China Quarterly" 163 (2000), p. 783–805.

181 Iacob N. Koch-Weser, *The Reliability of China's Economic Data: An Analysis of National Output*, U.S. China Economic and Security Review Commission Staff Research Project; U.S.-China Economic and Security Review Commission: Washington 2013, p. 6–44.

182 Daniele Brombal, *Accuracy of Environmental Monitoring in China…*, *op.cit.*, p. 1, 13.

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Public access to information in this area – itself a component of environmental protection – can be interpreted as the government's willingness to open up its activities to its citizens through access to administrative meetings or participatory lawmaking.[183] However, from the perspective of a citizen who experiences the effects of ecosystem pollution, it is important to be able to assert not only his or her rights but also those of the public – before the courts, via civil society. Thus, since 2015, environmental NGOs and prosecutors have filed over a hundred lawsuits, which indicate that the public interest has gained a legal foundation in the Middle Kingdom. The amended Environmental Protection Act gives environmental organizations the opportunity to sue polluting corporations in the public interest. Almost ten environmental NGOs filed 48 claims in 2015 and became an inspiring example of public participation in environmental protection. This includes the largest environmental organizations in China, such as Friends of Nature, Green Development Foundation, and China Biodiversity Conservation. As in other countries, the main obstacle to their activities are insufficient financial resources to implement the relevant measures.[184]

In conclusion, China's environmental policy is still undergoing transformation. Some of the solutions adopted are positive and constructive. For instance, China has established a range of measures in recent years pertaining to compliance with environmental disclosure standards. In environmental disclosure, officials have identified a number of opportunities to influence the shape of environmental protection.[185] Although the level of environmental pollution is still very high, it should be noted that China has achieved some successes,[186] such as reducing sulfur dioxide emissions, improving the safety of food production, and reducing energy consumption. However, the results of these actions are less tangible if one recalls that the rapid process of industrialization and urbanization in the Middle Kingdom has already caused serious environmental damage.

The list of problems should encompass air, water, and soil quality, as well as water shortages in some parts of the country. In the case of a centralized system like China's, it can be pointed out that the effectiveness of environmental protection still depends on the ability of politicians to set priorities and to implement them on both the central and local levels. Indeed, an overview of policy im-

183 Article 53 of the Chinese Environmental Protection Act of 26 December 1989 provides for the participation of citizens, legal persons, and other organizations in the right to obtain environmental information as well as participation in the supervision of environmental protection activities. See Zhonghua renmin gongheguo huanjing baohu fa, *op. cit.*

184 Mehran Idris Khan / Yen-Chiang Chang, *Environmental Challenges and Current Practices in China: A Thorough Analysis*, "Sustainability" 10 (2018), p. 12.

185 Alex Wang, *Explaining Environmental Information Disclosure in China*, "Ecology Law Quarterly" 4 (2018), p. 865–923.

186 Oran R. Young et al., *Institutionalized governance processes…*, *op. cit.*, p. 169.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

plementation practice shows that not all incentives at the implementation level result in improved environmental protection. At the same time, we must constantly recall that while stability and balance are distinctive features of the style of governance embraced by China's meritocracy, ensuring the continuity of the country's economic development is nevertheless at the forefront of the government's current strategy and policy. This leads to one overarching conclusion: that this approach to policy will be an intractable barrier to expanding the scope of environmental protection. However, China is certainly not alone in assigning more value to economic objectives at the expense of the environment.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

Chapter 3. The concept of the ecological civilization and sustainable development in China

Building an 'ecological civilization' (生态文化, *shengtai wenhua*) has been one of the overarching challenges of China's domestic politics for the last two decades. The enormous scale of the pollution affecting the country's air, soil, and water has not only posed a serious threat to human health and life, but also generated high economic costs, thus hampering the emergence of an ecologically minded society. It is therefore not surprising that, at the beginning of the new millennium, environmental issues have become a priority. However, the novelty of this pivot lies in the fact that the authorities in Beijing, in formulating their vision of green development based on the construction of an 'ecological civilization,' refer to ancient philosophical concepts that emphasize the unity of man and nature. In this context, the concept of unity is supposed to emphasize both the existing harmony between man and nature (天人合一, *tianren heyi*) and the need to function according to nature's rhythm. This approach assumes that humankind does not stand in contrast with nature, but is an inseparable part of it, which translates into the need to protect the environment and use the Earth's resources rationally. It is further assumed that the harmonious relationship between man and nature influences the formation of production and consumption patterns conducive to this goal.

The concept of an 'ecological civilization' first emerged in China in the mid-1980s. On February 18, 1985, the *Guangming Ribao* (光明日报) used his term while reporting on an article previously published in the Soviet Union. Shortly afterwards, during the 1987 National Conference on Ecological and Agricultural Problems, economist Ye Qianji proposed a model of sustainable development in agriculture as the cornerstone of an ecological civilization grounded in the harmonious relationship between man and nature. In the same year, Liu Shihua argued that modern civilization should combine material, spiritual, and ecological features into a greater whole.[187] In 1997, the emergence of these and

187 *Shengtai wenming jianshe ying chengwei zhongyao renwu* (生态文明建设应成为重要任

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

similar voices culminated in the publication the book *Ecological Civilization and the Sustainable Development of China* (生态文明观与中国可持续发展), which presented the results of research carried out under the direction of Liu Zongchao. Among other things, it argued that the ecological civilization is an advanced form of development that will follow the agrarian and industrial civilizations.[188]

However, it should be noted that, in the 1990s, the term 'ecological civilization' was identified with the notion of sustainable development, without clearly spotlighting the issue of environmental protection. This changed only at the dawn of the new millennium, when the need for coordinated action in this area was highlighted by the further and fifth generations of Chinese leaders, led by Hu Jintao and Xi Jinping. Focusing on the coordinated and comprehensive development of relationships between humans and nature in building the ecological civilization provides a different point of departure. Thus, it can be assumed that China is trying to develop a new approach to integrate economy, society, and ecology based on elements that define its history. The willingness to develop a new growth paradigm based on a different set of values than that of the West clearly shows that taking inspiration from the outside is not a priority for Chinese policymaking in this case.

1. A sustainable development strategy

It is undeniable that China played a critical, constructive role during the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro, known as the Earth Summit. The 1992 Rio Declaration on Environment and Development, adopted on June 14, 1992, stressed that sustainable development must take environmental protection into account.[189] In line with this, in July 1992, China quickly released what it called Agenda 21 – a white paper on population, environment, and development in China in the 21st century (中国 21 世纪议程. 中国 21世纪人口、环境与发展白皮书; China's Agenda 21 – White Paper on China's Population, Environment and Development in the 21st Century). Shortly afterwards, on March 25, 1994, the State Council adopted a Plan that set out objectives, programs, and directions for sustainable development. In particular, it emphasized the rational management of raw material resources and

务), Zhongguo fazhan guancha (中国发展观察), March 27, 2012, http://politics.gmw.cn/2012-09/27/content_5608688.htm.

188 Liu Zongchao, *Shengtai wenming guanyu Zhongguo ke chixu fazhan* (生态文明观与中国可持续发展), Zhongguo kexue jishu chubanshe (中国科学技术出版社), Beijing 1997.

189 Rio Declaration on Environment and Development, United Nations Conference on Environment and Development, United Nations Documents, June 14, 1992, http://www.un-documents.net/rio-dec.htm.

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environmental protection. It also recognized the need to harmonize economic, social, and environmental objectives.[190]

Agenda 21 is a set of planned actions for sustainable development, which was recognized in 1995 as a foundation for a new canon of strategic planning in China. However, the development and implementation of Agenda 21 reflected not only a willingness to implement the commitments that stemmed from UNCED, but also the choice China had made in the face of serious environmental problems. Because of this, in September 1995, PRC President Jiang Zemin stated that, in the process of national modernization, it is sustainable development that should be viewed as the main strategy. China should therefore prioritize controlling population growth, preserving natural resources, and protecting the environment. Demographic growth must be adapted to social development, while economic development must be coordinated with the responsible use of available resources and environmental protection.[191] In a similar vein, President Jiang pointed out in July 1996 that economic development should be viewed in a comprehensive way, taking into account the population, resources, and the environment. This means that development must take into account the opportunities and needs of future generations.[192] In this context, it is unsurprising that, in December 1998, the Party-associated daily *Renmin Ribao* (人民日报) argued that extensive production combined with the wasting of resources and environmental degradation pose a serious threat to the state's development policy. It suggested that China should follow a path of sustainable development where society, economy, resources, and environment are all harmonized with one another and where current needs will not limit the needs and development opportunities of future generations.[193]

The actions taken so far can be said to reflect the desire to reconcile economic growth with environmental protection. For instance, China's Agenda 21 laid out a framework to tailor projects to the specific local conditions of each province. For the coastal provinces of Eastern China, the main focus was on increasing

190 Zhongguo 21 shiji yicheng. Zhongguo 21 shiji renkou, huanjing yu fazhan baipishu (中国 21 世纪议程. 中国 21 世纪议程. 中国 21 世纪人口、环境与发展白皮书), The Administrative Center for China's Agenda 21, http://www.acca21.org.cn/cca21pa.html.

191 *Jiang Zemin: Zhengque chuli shehui zhuyi xiandaihua jianshe zhong de ruogan zhongda guanxi, zai dang de shisi jie wu zhong quanhui bimu shi de jianghua* (江泽民:正确处理社会主义现代化建设中的若干重大关系, 在党的十四届五中全会闭幕时的讲话), Renmin wang (人民网), September 28, 1995, http://www.people.com.cn/GB/channel1/10/20000529/80747.html.

192 Jiang Zemin, *Baohu huanjing, shishi ke chixu fazhan zhanlüe* (1996 nian 7 yue 16 ri) (保护环境,实施可持续发展战略 (1996年7月16日) [in:] *Jiang Zemin wenxuan* (江泽民文选; Selected Works of Jiang Zemin), vol. 1, Renmin chubanshe (人民出版社), Beijing 2006, p. 532.

193 *Li zai dandai gong zai qianqiu. Shishi ke chixu fazhan zhanlüe (gaige kaifang ershi nian te gao (8)* (利在当代 功在千秋. 实施可持续发展战略（改革开放二十年特稿（8）), "Renmin Ribao" (人民日报), December 8, 1998.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

resource efficiency, transforming traditional production and consumption patterns, and developing technology for environmental protection and clean production. In relation to the poorer regions of the interior, priority was given to actions that helped to reduce poverty, incentivize rational use of resources, stimulate energy conservation, and increase investment in infrastructure. At the same time, the plan laid down rules to support the development of renewable energy production in Xinjiang and Inner Mongolia – areas with particularly strong wind and solar energy potential. The willingness to avoid large-scale errors meant that China's approach was characterized by the primacy of learning by doing. Hence, the implementation of pilot projects primarily took the form of experiments, which later formed the basis for the development of models applicable to different local circumstances.

Since the beginning of the new century, the Communist Party of China has emphasized the need to integrate the government's economic, social, and environmental objectives with even greater force. As a result, the government set its sights on increasing environmental awareness among its citizens. In his speech marking the 80th anniversary of the founding of the CPC on July 1, 2001, Jiang Zemin emphasized the need to promote harmony between humankind and nature in order for people to live and work in a beautiful environment. He contended that the country should thus follow the path of sustainable development, balancing economic development with population size, resources, and consideration for the state of the environment.[194] During the 16th Congress of the Communist Party of China in 2002, Jiang Zemin spoke about the need to maintain a high rate of economic development. However, he also pointed out that the architects of economic expansion should consider new ideas, increase domestic demand, and pursue and a national renewal strategy based on science, education, and sustainable development. Jiang further argued that although economic growth determines comprehensive social progress, it must be balanced and based on family planning policies as well as environmental and natural resource protection. Finally, he emphasized the need to maintain a low birth rate and rational use of natural resources. These and other proposed measures were, in his opinion, sufficient to increase China's national awareness of environmental protection and its importance.[195]

194 Jiang Zemin, *Zai qingzhu Zhongguo gongchandang chengli bashi zhounian dahui shang de jianghua* (2001 nian 7 yue 1 re) (在庆祝中国共产党成立八十周年大会上的讲话》(2001年7月1日) [in:] *Jiang Zemin wenxuan* (江泽民文选; Selected Works of Jiang Zemin), vol. 3, Renmin chubanshe (人民出版社), Beijing 2006, p. 294–295.

195 Quanmian jianshe xiaokang shehui, kaichuang Zhongguo tese shehui zhuyi shiye xin jumian, zai Zhongguo gongchandang di shiliu ci quanguo daibiao dahui shang de baogao (全面建设小康社会，开创中国特色社会主义事业新局面，在中国共产党第十六次全国代

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In October 2003, during the third plenary session of the CPC's 16th Congress, the central authorities underscored the need for people-centered action and announced their intention to establish comprehensive, coordinated, and sustainable development as well as to continue to promote economic and social development. The guidelines adopted on this occasion emphasized the coordination of urban and rural development, regional development, economic and social development, harmonious human and natural development, and a balance of internal development and openness to the outside world.[196] In a document summarizing the country's environmental achievements for 1996–2005 (中国的环境保护, Environmental Protection in China (1996–2005)) released in June 2006, the government reiterated the great importance it attached to environmental protection, linking this issue to a long-term strategy for the modernization of the country for the benefit of current and future generations.[197]

The next (fourth) generation of Chinese leaders gave ecology priority status. From this point on, environmental plans had to be aligned with economic and social development plans. Hence, during the 17th CPC Congress in October 2007, Hu Jintao, President of the PRC and Secretary General of the CPC, underlined the importance of environmental protection in achieving sustainable development. This was the first official mention of the concept of the 'ecological civilization' (生态文明, *shengtai wenming*), understood as a consumption model based on rational resource management and environmental protection. At the same time, Hu indicated that such a development model should be people-centered and based on a coordinated and holistic approach.[198] Five years later, during the 18th Congress of the CPC, Hu again spoke about building an ecological civilization, this time as an important component of the state's development policy. He stressed that the pursuit of comprehensive, balanced, and sustainable development is an essential requirement in bringing the scientific perspective of development to fruition. At the same time, he pointed to the need to coordinate progress in five areas: economic, political, cultural, social and environmental matters. An important aspect of Hu's speech was the emphasis on the need to raise environmental awareness, which he connected with respect for nature, its

表大会上的报告), Zhongguo guoqing – Zhongguo wang (中国国情-中国网), November 8, 2002, http://www.china.com.cn/guoqing/2012-10/17/content_26821180.htm.

196 Zhongguo gongchandang di shiliu jie zhongyang weiyuanhui di san ci quanti huiyi gongbao (中国共产党第十六届中央委员会第三次全体会议公报), Xinhua (新华), Renmin wang (人民网), October 14, 2003, http://people.com.cn/GB/shizheng/1024/2133923.html.

197 Zhongguo de huanjing baogao (1996–2005) (中国的环境保护（1996－2005）, Zhongyang zhengfu menhu wangzhan (中央政府门户网站), June 2006, http://www.gov.cn/zwgk/2006-06/05/content_300288.htm.

198 Hu Jintao zai dang de shiqi da shang de baogao (胡锦涛在党的十七大上的报告), Xinhua (新华), Renmin wang (人民网), October 24, 2007, http://politics.people.com.cn/GB/1024/6429094.html.

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protection, and adaptation to its laws. He stressed that environmental progress should be prioritized and considered throughout the pursuit of economic, political, cultural and social progress. According to this speech, only hard work would make it possible to build a "beautiful China" (美丽中国, *meili Zhongguo*) and achieve the sustainable and balanced development of the Chinese people.[199]

The theory of scientific development proposed by President Hu Jintao defined a framework for environmental action that would endure for the next several years. In the 10th and 11th Five-Year Plans (2001–2005 and 2006–2010, respectively), the State Environmental Protection Administration already put more emphasis on the effectiveness of enforcing environmental regulations in individual regions. This is well illustrated by the transformation of the State Administration for Environmental Protection (established in 1982 as the National Environmental Protection Agency) into the Ministry of Environmental Protection. In addition, the China Ecological Civilization Research and Promotion Association (中国生态文明研究与促进会), established on November 11, 2011, has become a platform for deepening theoretical research on the ecological civilization and its development.[200]

The continued implementation of the expected changes is best illustrated by the fact that, in the first decade of the new millennium, China proposed a set of legal solutions that were in line with international standards. In total, in the area of environmental protection, several dozen laws and regulations were adopted during this period, the most significant of which include:

- Regulations on the Administration of Construction Project Environmental Protection (中华人民共和国国务院令) of November 18, 1998. An important innovation introduced in this regulation was an environmental impact assessment system for construction projects.[201]
- A second amendment to the Law on Prevention and Control of Air Pollution (大气污染防治法) of September 5, 1987, introduced on April 29, 2000.[202] The first amendment was introduced in 1995.

199 Hu Jintao zai Zhongguo gongchangdang di shiba ci quanguo daibiao dahui shang de baogao (胡锦涛在中国共产党第十八次全国代表大会上的报告), Xinhua (新华), Zhongyang zhengfu menhu wangzhan (中央政府门户网站), November 17, 2012, http://www.gov.cn/ldhd/2012-11/17/content_2268826.htm.

200 Chinese Ecological Civilization Research and Promotion Association Founded, Ministry of Ecology and Environment of People's Republic of China, November 14, 2011, http://english.mee.gov.cn/News_service/infocus/201111/t20111123_220428.shtml.

201 Jianshe xiangmu huanjing baohu guanli tiaoli, Zhonghua renmin gongheguo guowuyuan ling di 253 hao (建设项目环境保护管理条例, 中华人民共和国国务院令 第253号), Shengtai huanjing bu (生态环境部), November 29, 1998, http://www.mee.gov.cn/gzfw_13107/zcfg/fg/xzfg/201605/t20160522_343327.shtml.

202 Zhonghua renmin gongheguo daqi wuran fangzhi fa (xiuding) (中华人民共和国大气污染防治法（修订）, Quanguo renda changwei hui (全国人大常委会), April 29, 2000, http://www.npc.gov.cn/wxzl/wxzl/2000-12/07/content_9501.htm.

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- The Cleaner Production Promotion Law (清洁生产促进法) of June 29, 2002, which entered into force on January 1, 2003. The act covered areas such as clean production, efficient use of resources, reduction of pollution, environmental protection, and promotion of sustainable development.[203]
- The Law on the Prevention and Control of Environmental Pollution (中华人民共和国固体废物污染环境防治法) of December 29, 2004, which entered into force on April 1, 2005. This act incorporated the issue of water quality into assessments of the activities of local governments (Article 10). It imposed stricter penalties for causing pollution (Article 5). The solutions adopted also encouraged the purchase and use of recycled and reusable products (Article 7).[204]
- The Renewable Energy Law (中华人民共和国可再生能源法) of February 28, 2005[205] and its amendment, introduced on December 26, 2009.[206]
- The Law on the Prevention and Control of Water Pollution (中华人民共和国水污染防治法) of February 28, 2008, which entered into force on June 1, 2008. The law refers to areas such as pollution control and the improvement of water quality. It set priorities for the protection of sources of drinking water as well as protection against industrial and agricultural pollution (Article 3). Local authorities at the district level and above are obliged to control water pollution levels (Article 4). It also established a system of accountability and assessment of local authorities in their pursuit of objectives related to the aquatic environment (Article 5).[207]

However, the spectacular economic development experienced by China in the two decades leading up to the first years of the 21st century has highlighted a vast array of problems – including, in particular, environmental degradation and

203 Zhonghua renmin gongheguo qingjie shengchan cujin fa (di 72 hao) (中华人民共和国清洁生产促进法 (第七十二号), Zhongyang zhengfu menhu wangzhan (中央政府门户网站), April 29, 2002, http://www.gov.cn/gongbao/content/2002/content_61640.htm.

204 Zhongguo renmin gongheguo guti feiwu wuran huanjing fangzhi fa (中华人民共和国固体废物污染环境防治法), Zhongyang zhengfu menhu wangzhan (中央政府门户网站), December 29, 2004, http://www.gov.cn/flfg/2005-06/21/content_8289.htm.

205 Zhongguo renmin gongheguo kezaisheng nengyuan fa (中华人民共和国可再生能源法), Zhongguo zhengfu menhu wangzhan (中国政府门户网站), February 28, 2005, http://www.gov.cn/ziliao/flfg/2005-06/21/content_8275.htm.

206 Quanguo renmin daibiao dahui changwu weiyuanhui guanyu xiugai "Zhonghua renmin gongheguo ke zaisheng nengyuan fa" de jueding (全国人民代表大会常务委员会关于修改《中华人民共和国可再生能源法》的决定), Zhongyang zhengfu menhu wangzhan (中央政府门户网站), December 26, 2009, http://www.gov.cn/flfg/2009-12/26/content_1497462.htm.

207 Zhongguo renmin gongheguo shui wuran fangzhi fa (中华人民共和国水污染防治法), Zhongyang zhengfu menhu wangzhan (中央政府门户网站), February 28, 2008, http://www.gov.cn/flfg/2008-02/28/content_905050.htm.

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increasing social inequality. In this context, it is not surprising that the 11th Five-Year Plan (2006–2010) contained slightly more direct references to green development. In October 2005, during the fifth session of the 16th CPC Central Committee, Prime Minister Wen Jiabao referred to the new Plan in stating that building a harmonious society requires an approach that prioritizes employment, social security, poverty reduction, education, healthcare, environment, and security[208] The Plan highlighted issues such as energy and water conservation, reducing levels of pollution, and environmentally friendly economic growth. Other issues raised included protecting arable land and developing modern agriculture, improving China's management of natural resources, increasing energy efficiency, and bolstering both environmental protection and sustainable development. In addition, the Plan underscored the need to protect the natural environment in marine and coastal areas and increase the country's reliance on renewable resources (Table 7).[209]

Table 7. Environmental protection targets (11th Five-Year Plan)

Indicator	2005	2010	Change
Energy consumption per unit of GDP			-20 %
Compulsory water consumption per unit of industrial value added			-30 %
Compulsory coefficient of irrigation efficiency	0.45	0.50	0.05
Expected rate of utilization of industrial solid waste	55.8	60.0	4.2
Expected farmland (millions of hectares)	1.22	1.20	-0.3
Compulsory decrease of major pollutants			-10 %
Compulsory forest cover	18.2	20.0	1.8

Source: Cao Jing / Richard Garbaccio / Mun S. Ho, *China's 11th Five-Year Plan and the Environment: Reducing SO2 Emissions*, "Review of Environmental Economics and Policy" 3(2) (2009), p. 237.

The implementation process of the 11th Five-Year Plan (2006–2010) stressed the importance of environmental protection by focusing mainly on the enforcement of environmental pollution regulations, pollution control, and increasing investments to improve water quality. One important aspect of the changes that followed was the creation of a new system of parameters used to evaluate the achievements of local officials. The novelty of this system was to take into ac-

208 *Wen explains proposal on 11th 5-year plan, Zhongguo zhengfu menhu wangzhan* (中国政府门户网站), October 20, 2005, http://www.gov.cn/english/2005-10/20/content_80097.htm.

209 Zhongguo renmin gongheguo guomin jingji he shehui fazhan di shiyi ge wu nian guihua gangyao (中华人民共和国国民经济和社会发展第十一个五年规划纲要), Zhongyang zhengfu menhu wangzhan (中央政府门户网站), March 14, 2006, http://www.gov.cn/gongbao/content/2006/content_268766.htm.

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count not only GDP growth rates, but also social and environmental indicators.[210] In 2004, the National Development and Reform Commission presented the core components of its strategy to improve energy efficiency in the medium and long term (Energy Conservation Mid-Long Term Plan). The plan proposed financial incentives for local authorities and industry to implement energy-efficient projects. An inherent part of the plan was a program identifying ten key projects (重点工程, *zhongdian gongcheng*) that were to lead to 240 million tons of carbon equivalent in energy savings (Table 8).[211] Similar principles were used to launch the Commission's Top-1000 Enterprises Energy-Saving Program (2006), whose goal was to improve energy efficiency in China's 1000 largest companies.

Table 8. Ten Key Projects

Renovation of coal-fired industrial boilers
Regional-level combined heat and power project
Waste heat and pressure utilization
Oil conservation and substitution
Motor system energy efficiency
Energy System Optimization
Energy efficiency and conservation in buildings
Green lighting
Government procurement of energy efficient products
Energy conservation monitoring and evaluation system

Source: Own work based on: Guojia fazhan gaige wei guanyu yinfa jieneng zhong-changqi zhuanxiang guihua de tongzhi (fagai huan zi [2004] 2505 hao) (国家发展改革委关于印发节能中长期专项规划的通知 (发改环资 [2004] 2505号), Guojia fazhan gaige wei (国家发展改革委), http://www.ndrc.gov.cn/fzgggz/hjbh/jnjs/200507/t20050711_45823.html

2. The ecological civilization in Xi Jinping's 'new era'

The current decade illustrates China's bidirectional ecological activity. One direction is exemplified by the country's call for broad cooperation on climate change issues on the international stage, based on the principle of 'common but differentiated responsibilities' (共同但有区别的责任, *gongtong dan you qubie*

210 Barry Naughton, *The New Common Economic Program: China's Eleventh Five Year Plan and What It Means*, "China Leadership Monitor" 16 (2005), http://media.hoover.org/sites/default/files/documents/clm16_bn.pdf.

211 Guojia fazhan gaige wei guanyu yinfa jieneng zhong-changqi zhuanxiang guihua de tongzhi (fagai huan zi [2004] 2505 hao) (国家发展改革委关于印发节能中长期专项规划的通知 (发改环资 [2004] 2505号), Guojia fazhan gaige wei (国家发展改革委), http://www.ndrc.gov.cn/fzgggz/hjbh/jnjs/200507/t20050711_45823.html.

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de zeren). In line with this approach, China declared its willingness to deepen cooperation on research, transfer of technology and capital, while also paying attention to the need to support developing countries in the fight against climate change.[212] The second direction was the acceleration of activities related to building out a system based on the concept of the ecological civilization in the Middle Kingdom by the current, fifth generation of Chinese leaders. A key national goal is that the state of the natural environment will be fundamentally improved by 2035, thus bringing the idea of a 'beautiful China' to fruition. It was for this reason that the 12th Five-Year Plan (2011–2015) elevated the issue of environmental protection, which is identified with green and low-emission development, to the status of a key priority. Along the way, the government emphasized the importance of energy conservation and reducing pollution.

Given that this was China's first direct foray into the debate on climate, the climate change targets were to reduce energy consumption per unit of GDP by 16 %, reduce carbon dioxide emissions by 17 %, and increase the share of non-fossil fuels in total primary energy consumption from 8.3 % in 2010 to 11.4 % in 2015 and 15 % in 2020. In addition to the planned increase in forest areas (a process conducive to carbon sequestration), the Plan highlighted issues related to the protection of water resources and soils, the promotion of cleaner production in key industries, and the creation of a waste separation and recycling system.[213] In this context, it is notable that, at the end of 2011, the government set low-carbon targets for 10,000 companies for the 2011–2015 period. The Ten-Thousand Enterprises Energy Conservation and Low Carbon Program, commonly known as the Ten-Thousand Enterprises Program, involved selecting the most energy-intensive industrial businesses and imposing restrictions on them in terms of energy consumption. Companies that consumed at least 10,000 tons of carbon equivalent per year – which together accounted for about 60 % of the country's total energy consumption – were identified as highly energy-intensive.[214]

In July 2013, President Xi Jinping stated that moving toward the era of the ecological civilization and the building of a "beautiful China" are critical to

212 Guomin jingji he shehui fazhan di shier ge wu nian guihua gangyao (国民经济和社会发展第十二个五年规划纲要), Zhongyang zhengfu menhu wangzhan (中央政府门户网站), March 16, 2011, http://www.gov.cn/2011lh/content_1825838.htm.

213 *Ibidem.*

214 Guanyu yinfa wanjia qiye jieneng ditan xingdong shishi fang'an de tongzhi (fagai huan zi [2011] 2873 hao) (关于印发万家企业节能低碳行动实施方案的通知 (发改环资 [2011] 2873号), Guojia fazhan gaige wei (国家发展改革委), December 7, 2011, http://www.ndrc.gov.cn/zcfb/zcfbtz/201112/t20111229_453569.html; Wanjia qiye jieneng ditan xingdong shishi fang'an (万家企业节能低碳行动实施方案), Guojia fazhan gaige wei (国家发展改革委), December 2011, https://www.ndrc.gov.cn/xxgk/zcfb/tz/201112/W020190905511164831982.pdf.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

realizing the dream of a great revival of the Chinese people. In this context, he stressed the need to protect resources and the environment as well as to promote green and low-carbon development more consciously, integrating the building of an ecological civilization into economic, political, and cultural progress.[215] In September 2013, while answering students' questions during his stay in Kazakhstan, he argued that "lucid waters and lush mountains are invaluable assets" (绿水青山就是金山银山; *lüshui-qingshan jiushi jinshan yin shan*). He also stressed that short-term economic development must not come at the expense of the environment. He assured his audience that the Beijing authorities would pursue the strategic task of building an ecological civilization and a "beautiful China" so that future generations could enjoy blue skies, green earth, and clean water.[216] In May 2015, he spoke in a similar vein about promoting coordinated green development in which the environment should be the basis for improving people's quality of life, while at the same time helping to build a positive image of China.[217] Xi Jinping made references to these themes while touring China as well. In January 2015, during his visit to the province of Yunnan, he stressed that the economy must develop, but not at the expense of environmental degradation. He expressed the view that environmental protection is a long-term task that takes time to complete, explaining illustratively that environmental protection should be seen in the same way as protecting one's own eyes and life.[218] He repeated this comparison in March 2016 in Qinghai Province, where he said that a long-term and comprehensive perspective is needed to save resources and protect both the environment and nature as a whole.[219]

The 19th Congress of the CPC in October 2017 gave new impetus to the construction of an ecological civilization. As Secretary General of the Party, Xi Jinping spoke about accelerating the reforms associated with the ecological civilization and the formation of a "beautiful China," signaling the need for a

215 *Shengtai wenming guiyang guoji luntan 2013 nian nianhui kaimu. Xi Jinping zhi hexin* (生态文明贵阳国际论坛2013年年会开幕. 习近平致贺信), Xinhua (新华), July 20, 2013, http://www.xinhuanet.com//politics/2013-07/20/c_116619686.htm.

216 *Xi Jinping fabiao zhongyao yanjiang xu gongjian "sichou zhi lu jingji dai"* (习近平发表重要演讲 吁共建"丝绸之路经济带"), Xinhua (新华), September 7, 2013, http://www.xinhuanet.com//politics/2013-09/07/c_117272280.htm.

217 *Xi Jinping: Zhuazhu jiyu lizu youshi jiji zuowei xitong mouhua "shisanwu" jingji shehui fazhan* (习近平：抓住机遇立足优势积极作为系统谋划"十三五"经济社会发展), "Renmin Ribao" (人民日报), May 29, 2015.

218 *Xi Jinping zai Yunnan kaocha gongzuo shi qiangdiao: jianjue da hao fupin kaifa gongjianzhan jiakuai minzu diqu jingji shehui fazhan* (习近平在云南考察工作时强调：坚决打好扶贫开发攻坚战加快民族地区经济社会发展), "Renmin Ribao" (人民日报), January 22, 2015.

219 *Xi Jinping canjia qinghai daibiao tuan shenyi shi qiangdiao. Rang ge minzu shouzu xiangqin gongtong fazhan* (习近平参加青海代表团审议时强调. 让各民族手足相亲共同发展), "Renmin Ribao" (人民日报), March 11, 2016.

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holistic approach to environmental protection and promoting environmentally friendly growth models. In this approach, man and nature form a community of life. People must respect nature, conform to its laws, and protect it. Only by observing these laws can mankind avoid the costly mistakes that result from its overexploitation. Any damage done to nature will eventually turn against man. Xi drew special attention to four issues. The first was promoting green growth. He connected this goal primarily to the economy, emphasizing comprehensive resource protection and recycling as well as water and energy efficiency. With respect to building an economic structure conducive to the implementation of ecological and low-carbon solutions, he highlighted the role of technological innovations in supporting energy conservation and environmental protection. Secondly, Xi pointed out the need to address significant environmental problems not only in the field of air, water, and soil pollution, but also those related to the management of river basins and coastal zones. In this context, Xi Jinping stressed the importance of disclosing information about the state of the environment, public participation, and the role of NGOs. Thirdly, he argued that the intensification of activities related to the protection of ecosystems points to the need to strictly delimit the development boundaries of cultivated and urban areas in order to prevent desertification and soil erosion, and to facilitate the protection of wetlands and natural forests. Fourthly, according to Xi, reforming state supervision of the ecological environment requires the creation of state institutions to manage natural resources and the ecological environment.[220]

In the context of these considerations, it is worth noting that Xi Jinping's ambitions with respect to building an ecological civilization are aimed at reviving the tradition dynamics of agricultural development. China is trying to promote a new type of urbanization by emphasizing smaller cities rather than large urban agglomerations. The former are also meant to serve as centers that integrate neighboring villages, providing their inhabitants with access to basic services related to education and health care, among others. The development of circular agriculture involves improving soil quality, reusing resources, recycling, and reducing harmful greenhouse gas emissions. The integration of environmental protection measures, in tandem with the restoration of old rural culture and the revival of traditional methods of production, is intended to reduce the development imbalance between urban and rural areas. It also aims to increase the capacity of cities to respond to crisis situations in a flexible manner.

The 13th Five-Year Plan (2016–2020) emphasizes the need to control air, water, and soil pollution. Targets have been set to reduce water consumption, energy

220 Zhonggong shijiu da kaimu Xi Jinping daibiao shiba jie zhongyang weiyuanhui zuo baogao (中共十九大开幕习近平代表十八届中央委员会作报告), Zhongguo wang (中国网), October 18, 2017, http://www.china.com.cn/cppcc/2017-10/18/content_41752399.htm.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

Table 9. Objectives related to contamination control

	Energy consumption per unit of GDP	Carbon dioxide emissions per unit of GDP	Share of non-fossil fuels in total primary energy consumption	Forest cover
Objectives of the 11th FYP (2006–2010) (in relation to 2005)	-20 %			20 %
Reported results from the 11th FYP	-19.1 %			20.36 %
Objectives of the 12th FYP (2011–2015) (in relation to 2010)	-16 %	-17 %	11.4 %	21.7 %
Reported results from the 12th FYP Plan	-18.2 %	-20 %	12 %	21.63 %
Objectives of the 13th FYP (2016–2020) (in relation to 2015)	-15 %	-18 %	15 %	23.04 %
Long-term objectives		-40–45 % (2020) -60–65 % (2030) (baseline: 2005)	20 % (2030)	26 % (2035)

Source: Own elaboration based on: *Zhongguo xuanbu hou 2020 qihou mubiao: Tan paifang qiangdu xiajiang 60 %–65 %* (中国宣布后2020气候目标：碳排放强度下降60 %–65 %), Beijixing jieneng huanbao wang (北极星节能环保网), July 1, 2015, http://huanbao.bjx.com.cn/news/20150701/636379.shtml; OECD, *Climate Change Mitigation Policies and Progress: Policies and Progress*, OECD Publishing, Paris 2015; Zhonghua renmin gongheguo guomin jingji he shehui fazhan di shiyi ge wu nian guihua gangyao (中华人民共和国国民经济和社会发展第十一个五年规划纲要), Zhongyang zhengfu menhu wangzhan (中央政府门户网站), March 14, 2006, http://www.gov.cn/gongbao/content/2006/content_268766.htm; Guomin jingji he shehui fazhan di shier ge wu nian guihua gangyao (国民经济和社会发展第十二个五年规划纲要), March 16, 2011, Zhongyang zhengfu menhu wangzhan (中央政府门户网站), http://www.gov.cn/2011lh/content_1825838.htm; Guowuyuan guanyu yinfa daying lantian baowei zhan san nian xingdong jihua de tongzhi (guo fa [2018] 22 hao) (国务院关于印发打赢蓝天保卫战三年行动计划的通知 (国发 [2018] 22号)), Zhongyang zhengfu menhu wangzhan (中央政府门户网站), July 3, 2018, http://www.gov.cn/zhengce/content/2018-07/03/content_5303158.htm

consumption, and carbon dioxide emissions per unit of GDP by 23 %, 15 %, and 18 % respectively by the end of this decade. The Plan also stresses the importance of the efficient use of energy resources and improvements in the quality of the environment. It accords priority to measures to reduce air pollution in all cities,

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starting from the prefectural level. The measures adopted should enable these cities to maintain good air quality 80 % of the year.[221]

The objectives of the 13th Five-Year Plan state that, in order to achieve green growth, it is necessary to reduce the economy's overall energy consumption and introduce rational use of natural resources. However, a significant difference relative to previous plans was the decoupling of increased emissions from economic growth, i.e., a break with an approach that considered only quantitative restrictions on emissions of pollutants, which had long been regarded as the main tool in the fight for environmental improvement. It is no wonder that the goals set in the previous Five-Year Plans were met and surpassed, but without any tangible improvement in the quality of the environment. Thus, the main indicator of the new plan was the improvement of air quality while sacrificing the focus on achieving only quantitative reduction rates in total emissions. The Plan underscores that the main engine of the Chinese economy should be innovation rather than just investment. In contrast to the previous period, when the emphasis was mainly on economic growth, the new Plan highlighted the importance of smart growth in support of ecological innovation.

The 13th Plan demonstrated that China would seek not only to intensify its efforts to move toward a more sustainable model of economic growth, but also to meet its climate commitments. The target GDP growth rate of no less than 6.5 % per year over five years (2016–2020) was to be anchored primarily in services, whose share was to increase by several percentage points by 2020. This is evidence that China plans to focus on more innovative and efficient production, as these sectors tend to have lower levels of greenhouse gas emissions and air pollution compared to heavy industry and the construction sector. By setting quantitative targets for maintaining energy consumption at no more than 5 billion tons of standard carbon equivalent in 2020, China aims to demonstrate its willingness to implement the commitments it made at the Paris Climate Change Conference. The new objectives show that the Beijing authorities are no longer interested exclusively in maintaining a high growth rate, but also in the quality of that growth. Hence, the activities rolled out by the government were aimed at controlling emissions in energy-intensive industries, mainly revolving around the energy, cement, steel, and aluminum sectors. In addition, China has initiated the construction of a single carbon market,[222] implemented a reporting and verification system for key industries, and established a green financing sys-

221 Zhengfu gongzuo baogao (政府工作报告), Xinhua (新华), Zhongyang zhengfu menhu wangzhan (中央政府门户网站), March 17, 2016, http://www.gov.cn/guowuyuan/2016-03/17/content_5054901.htm.

222 Łukasz Gacek, *Zielona energia w Chinach. Zrównoważony rozwój – Ochrona środowiska – Gospodarka niskoemisyjna*, Wydawnictwo Uniwersytetu Jagiellońskiego, Kraków 2015, p. 149–151.

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tem.[223] China's commitment to actively participate in global efforts to combat climate change, with emphasis on its own contribution and on deepening bilateral dialogue with other countries, has also become an important vector of change.

In addition, the image of China that emerges from Xi Jinping's speeches is one where environmental protection is a priority area for human life.[224] This implies a change in the existing development model, which focused on rapid growth without taking into account the side effects. Hence, the preparation of economic and social development plans is currently contingent on environmental conditions. This is not an easy task, as local authorities continue to turn a blind eye to the activities of companies that violate environmental standards for fear of a decline in GDP growth in the region. This is well illustrated by data from the audits carried out in 2016–2018. Due to the large number of ecological transgressions committed in the first phase (late 2016 and early 2017), the government imposed penalties on 29,000 companies, amounting to 1.43 billion RMB (approximately 200 million USD). Around 17,000 people (entrepreneurs and representatives of local authorities) were punished and 1,527 arrested.[225] In 2018 another inspection in 20 provinces resulted in fines totaling 920 million RMB (approximately 128.8 million USD) and punishments for 8,400 people.[226]

In 2018, China's GDP grew by 6.6 % – the worst result since 1990. This reinforced an immediate perception among local authorities that the economic slowdown was caused by the centrally coordinated environmental campaign. However, the central authorities have countered this claim through the Minister of Ecology and Environment himself, Li Ganjie. Li argued that economic development and environmental protection are inseparable from each other. According to the proverb quoted by the minister, development without environmental protection would be like 'draining a pond to get at the fish' (竭泽而渔, *jieze-eryu*), while environmental protection without development would be like 'climbing a tree to catch a fish' (缘木求鱼, *yuanmu-qiuyu*). Thus, according to Li

223 Łukasz Gacek, *Nowa era zielonego i niskoemisyjnego rozwoju w Chinach*, "Bezpieczeństwo. Teoria i Praktyka" 1(XXX) (2018), p. 142–143.

224 *Xi Jinping zai quanguo shengtai huanjing baohu dahui shang qiangdiao jianjue dahao wuran fangzhi gongjianzhan tuidong shengtai wenming jianshe mai shang xin taijie* (习近平在全国生态环境保护大会上强调坚决打好污染防治攻坚战推动生态文明建设迈上新台阶), "Renmin Ribao" (人民日报), May 20, 2018.

225 *Jiema zhongyang huanbao ducha: you cha qi weizhu zhuanbian wei du zheng weizhu* (解码中央环保督察：由查企为主转变为督政为主), Zhongguo xinwen (中国新闻), March 15, 2018, http://www.chinanews.com/gn/2018/03-15/8468302.shtml.

226 *Zhongyang huanbao ducha zu jinnian gong dui 20 ge shengfen shishi "huitou kan"* (中央环保督察组今年共对20个省份实施"回头看"), Xinhua (新华), Zhongyang zhengfu menhu wangzhan (中央政府门户网站), December 28, 2018, http://www.gov.cn/xinwen/2018-12/26/content_5352407.htm.

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Ganjie, the reason for the slowdown should be sought not in the government's overzealous implementation of campaigns against smog, but in the waning awareness of the importance of environmental protection and in some regions at the beginning of 2019 as well as a loss of momentum in the fight against pollution. However, he also acknowledged in the speech that some poorer regions of the country face difficulties in transforming their economies and still depend on traditional industries.[227]

The concept of the ecological civilization has been encapsulated in one of the Communist Party's ideological foundations, recognized in the Party's statute as part of the Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era (习近平习近平时代中国特色社会主义思想, *Xi Jinping xinshidai Zhongguo tese shehui zhuyi*).[228] The importance of this issue is also illustrated by the fact that the concept of the ecological civilization was included in the content of the 1982 Constitution of the PRC, as amended in 2018.[229] References to the ecological civilization have also appeared in the amendment to the Environmental Protection Law (中华人民共和国环境保护法) of December 26, 1989 – i. e., the Law of April 24, 2014, which entered into force on January 1, 2015. The Law formulates objectives related to the protection and improvement of the quality of the natural environment, prevention of pollution and other social risks, protection of human health, promotion of the the ecological civilization, and sustainable economic and social development (Article 1).[230]

Another important change in the context of China's approach to environmental protection was the decision to establish the Ministry of Ecology and Environment and the Ministry of Natural Resources, which were set up in March 2018, during a session of the National People's Congress. The first of the newly created ministries was imbued with a number of powers to enforce environmental and climate change legislation. Until then, the National Development and Reform Commission was responsible for managing greenhouse gas emissions and combating the negative effects of climate change. These responsibilities,

227 *Li Ganjie zai 2019 nian quanguo shengtai huanjing baohu gongzuo huiyi shang de jianghua* (李干杰在2019年全国生态环境保护工作会议上的讲话), Sohu (搜狐), January 28, 2019, http://www.sohu.com/a/291920729_119628.

228 *Juesheng quanmian jiancheng xiaokang shehui duoqu xin shidai Zhongguo tese shehui zhuyi weida shengli* (决胜全面建成小康社会夺取新时代中国特色社会主义伟大胜利), Xinhua (新华), October 18, 2017, http://www.xinhuanet.com//politics/19cpcnc/2017-10/27/c_1121867529.htm.

229 Article 46 (6), 'The building of an ecological civilization'. (生态文明建设). Amended by the Law of 11 March 2018 amending the Constitution of the PRC. Zhonghua rennin gongheguo xianfa (中华人民共和国宪法), Zhongyang zhengfu menhu wangzhan (中央政府门户网站), March 11, 2018, http://www.gov.cn/guoqing/2018-03/22/content_5276318.htm.

230 Zhonghua renmin gongheguo huanjing baohu fa (zhuxi ling di 9 hao) (中华人民共和国环境保护法（主席令第九号）, Zhongyang zhengfu menhu wangzhan (中央政府门户网站), April 24, 2014, http://www.gov.cn/zhengce/2014-04/25/content_2666434.htm.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

together with the environmental functions assigned to other ministries, have now been transferred to the Ministry of Ecology and Environment. The change in the structure of the government reveals the role that central authorities assign to environmental issues. The Ministry of Ecology and Environment inherited most of the duties of the former Ministry of Environmental Protection. It also took over some of the competences previously assigned to the National Development and Reform Commission, the Ministry of Water Resources, and the State Oceanic Administration in the fight against pollution. The Ministry of Natural Resources, in turn, has merged different entities' responsibilities for the management of natural resources, which were previously scattered among other ministries.

This reorganization is a response to the well-known problem of overlapping responsibilities and unclear responsibility for environmental issues. As early as in 2015, an institutional reform plan was proposed, with the goal of fostering the construction of an ecological civilization. The plan was to facilitate the development of a new structure by 2020 and to consolidate the environmental management system with a view to improving environmental quality. It was assumed that this structure would take on overlapping regulatory functions and concentrate dispersed powers and responsibilities. It was also envisaged to integrate the national natural resource management system and to build an environmental responsibility assessment system that would fully reflect resource consumption and environmental damage. The plan set out rules for the payment of environmental damages and emphasized the need for sound resource management.[231] Li Ganjie, the new Minister of Ecology and Environment, captured the chaos of the existing environmental management system using the analogy of "nine dragons controlling water" (九龙治水, *jiu long zhishui*). The new ministry indisputably allows for better integration of activities in this area.[232]

231 Zhonggong zhongyang guowuyuan yinfa "shengtai wenming tizhi gaige zongti fang'an" (中共中央国务院印发《生态文明体制改革总体方案》), Zhongyang zhengfu menhu wangzhan (中央政府门户网站), September 21, 2015, http://www.gov.cn/guowuyuan/2015-09/21/content_2936327.htm.

232 *Li Ganjie: shengtai huanjing bu you "wu ge datong" ba fensan de zhize tongyi* (李干杰：生态环境部有"五个打通"把分散的职责统一), Renmin wang (人民网), March 17, 2018, http://env.people.com.cn/n1/2018/0317/c1010-29873503.html.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

2.1 The fight against smog

The fight against air pollution and the commitments made in the Paris Agreement to limit global warming to well below 2 °C[233] above pre-industrial levels force China to promote green growth based on the wider use of renewable energy sources. However, addressing the problems that result from existing air and water pollution remains a challenge, as does mitigating the risk of socioeconomic instability. The precipitous economic growth experienced by China has led to massive air pollution. It is beyond dispute that this surge in pollution is a consequence of the existing industrial structure. Over the past decades, coal has been the primary source of energy for China's industrial development. Completing the picture is the fact that the systematic increase in investment in heavy industry across China has been associated with an increase in energy consumption and negative repercussions for the environment. Although these observations are self-evident, investment in heavy industry characterized by "high investment, high energy consumption, and high pollution" has increased significantly since the beginning of the new millennium. Investments in light industry fell from nearly 42 % to 28 % in 1999–2012, siphoned off to heavy industry, where the same period saw an increase in investments from just over 58 % to 72 %.[234]

At the end of 2004, the Environmental Protection and Resources Conservation Committee of the National People's Congress, in a draft law on renewable energy, estimated that about 90 % of the emissions of sulfur dioxide and nitrogen oxides as well as 70 % of soot emissions in China are due to the combustion of fossil fuels. These emissions have been shown to cause not only acid rain but also respiratory diseases, seriously threatening human health and the economic development of the country. It is therefore not surprising that the country's energy structure – which is based primarily on coal combustion – is the main cause of its high greenhouse gas emissions. This in turn necessitates the development of renewable energy resources as an antidote for the purpose of environmental protection.[235]

In addition to these factors, demographic change, an ageing population, and urbanization also deserve attention.[236] We can already observe environmental

233 Paris Agreement, United Nations, December 12, 2015, https://sustainabledevelopment.un.org/content/documents/17853paris_agreement.pdf.

234 *Breakthroughs in Transformation: The 13th Five-year Plan Period – Historic Challenges for Structural Reform*, Chi Fulin (ed.), China Intercontinental Press, Beijing 2016, p. 155–156.

235 *Guanyu "Zhonghua renmin gongheguo ke zaisheng nengyuan fa (cao'an)" de shuoming* (关于《中华人民共和国可再生能源法（草案）》的说明), Zhongguo renda wang (中国人大网), December 25, 2004, http://www.npc.gov.cn/wxzl/gongbao/2005-04/25/content_5337638.htm.

236 Brian C. O'Neill et al., *Global demographic trends and future carbon emissions*, "Proceedings of the National Academy of Sciences" 107(41) (2010), p. 17521–17526.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

degradation as a direct consequence of galloping urbanization, particularly in the form of dwindling of green spaces, continually rising numbers of vehicles on the road (and with them, more exhaust fumes and noise), and rapidly increasing demand for electricity and heat. According to World Bank data, in 2018, 59 % of Chinese people lived in urban areas. By comparison, corresponding statistics for 1978 reveal that less than 18 % of the total population called urban areas home, rising to 35 % in 2000 and 49 % in 2010.[237] In absolute terms, this means that around 500 million people have moved to the cities since 1978. It is predicted that another 300 million will stream into the cities in the next 20–25 years. The Chinese Academy of Social Sciences estimates that a flow from rural to urban areas on such a scale will cost 650 billion RMB (about 91 billion USD) per year.[238] From the vantage point of the authorities in Beijing, ensuring a continued and reliable supply of energy will be of key importance for maintaining the appropriate pace of economic development.[239]

Managing the problem of environmental pollution has therefore become a serious challenge, forcing Chinese experts and government officials to abandon traditional ways of thinking about urban development. Cities that are dependent on the traditional branches of the manufacturing and raw materials industries face the need to diversify their economic potential while facing the influx of migrants from the rural areas. The modernization and redevelopment of cities will prompt the traditional industries to be dismantled amid the growing need to deploy new technologies across industry, services, and transport. This approach was reflected in a pilot program to promote low-carbon solutions in the provinces of Guangdong, Liaoning, Hubei, Shaanxi, and Yunnan as well as the cities of Tianjin, Chongqing, Shenzhen, Xiamen, Hangzhou, Nanchang, Guiyang, and Baoding, as presented in August 2010 by the National Development and Reform Commission. The proposed changes to the industrial structure were to help reduce carbon emissions and promote new, environmentally friendly lifestyles and consumption patterns.[240] The changes also covered housing construction, in whose case a three-stage development path was adopted. In the first stage, the government aimed to reduce energy consumption by 30 % in apartments designed in the early 1980s. In the second stage, the goal was to increase energy

237 *Urban population (% of total population), World Development Indicators*, The World Bank, July 10, 2019, https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS.

238 Lan Lan, *Urbanization to boost spending*, "China Daily", May 14, 2015.

239 Tadeusz Pindór, *Procesy urbanizacji i industrializacji w ChRL jako główne czynniki dynamizacji popytu na węgiel kamienny*, "Przegląd Górniczy" 68(9) (2012), p. 129.

240 *China launches low-carbon pilot in select cities, provinces*, "People's Daily", August 19, 2010.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

efficiency by 50 % in new buildings by 2010. In the third and final stage, the goal was to increase energy savings in new apartments to 65 % by 2020.[241]

In China, dealing with the smog problem as an integral waypoint toward building an ecological civilization is the main aspiration that connects the visibly increased investment in low-carbon solutions, promotion of renewable energy sources and coal gasification technologies, and the underground storage of carbon dioxide. This goal serves to make the government's actions credible in the eyes of both its citizens and international opinion.[242] In the 2000–2010 period alone, pollution generated high costs to the economy as a whole, estimated at 10 % of GDP per year. Air pollution alone resulted in loss of 6.5 % of the country's GDP, while water pollution and soil degradation added another 2.1 % and 1.1 %, respectively.[243] In addition, these problems contributed to a serious threat to human health and life. Calculations by the Health Effects Institute (HEI) indicate that air pollution in China leads to around 1.6 million premature deaths per year. Although China reduced the concentration of dangerous, airborne PM2.5 particles by 6.5 % in 338 cities in 2017 as a result of its smog reduction campaign in the north of the country from 2013 onwards, this does not mean that the mortality rate will decrease given the other problem – an ageing population.

At the end of 2017, there were 240 million people over 60 in China. In 2035, this number will increase to 400 million.[244] Older people are more susceptible to diseases and conditions caused by air pollution, including stroke, heart attack, and lung cancer. Scientists estimate that the concentration of fine particles suspended in the air in the north of China (north of the Huai River) was 55 % higher than in the south. This contributed to a reduction in life expectancy by 5.5 years in all age brackets.[245] According to the AirVisual and Greenpeace report, China and India led the list of the world's most polluted cities in 2018. The 100 cities with the world's worst air quality included 57 Chinese and 33 Indian cities. Out of more than 3,000 cities included in the ranking, nearly 400 are found in China. 64 % of these cities exceeded the PM2.5 pollution standard set by the

241 Zhang Zhongxiang, *Assessing China's Energy Conservation and Carbon Intensity: How Will the Future Differ from the Past?* [in:] *China: The Next Twenty Years of Reform and Development*, Ross Garnaut / Jane Golley / Song Ligang (eds.), ANU E Press, Canberra 2010, p. 103.

242 *Breakthroughs in Transformation-The 13th Five-year Plan Period…*, p. 158–159.

243 Keith Crane / Mao Zhimin, *Costs of Selected Policies to Address Air Pollution in China*, RAND, 2015, p. 3, https://www.rand.org/content/dam/rand/pubs/research_reports/RR800/RR861/RAND_RR861.pdf.

244 David Stanway, *China cuts smog but health damage already done: study*, Reuters, April 17, 2018.

245 Chen Yuyu / Avraham Ebenstein / Michael Greenstone / Li Hongbin, *Evidence on the impact of sustained exposure to airpollution on life expectancy from China's Huai River policy*, "Proceedings of the National Academy of Sciences" 110(32) (2013), https://www.pnas.org/content/110/32/12936.

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World Health Organization (WHO). Cumulatively, at the national level and after correcting for population size, China is 12th on this list in terms of average PM2.5 pollution levels. Bangladesh registers the highest levels, ahead of Pakistan and India. However, it is worth noting that, in 2017–2018, the concentration of these pollutants decreased by 12 % in China.[246]

The data presented clearly show that the level of air pollution in China remains very high. There are several reasons for this. Above all, the local economy and labor market are highly dependent on industries with high energy usage and atmospheric emissions. Nevertheless, fossil fuels will remain the main source of energy production in China in the long term. In addition, the number of cars on Chinese roads is expected to increase rapidly. Today, only one in ten people in the Middle Kingdom owns a car, but this share may more than triple within two decades. Automobile traffic is one of the major sources of pollution, including not only particulate matter, but also gases, primarily nitrogen oxides and carbon dioxide.

Completely different problems may occur in connection with progressing urbanization. The Beijing authorities not only see it as an opportunity to maintain development driven by (primarily infrastructural) investment, but remain convinced that the increased concentration of the population in urban areas provides an opportunity to implement innovative solutions. The development of green construction practices allows for wider use of energy-saving materials, which reduce heat loss and carry other benefits. Sustainable transport, in turn, minimizes the environmental impact of vehicles. The use of green solutions leads to a reduction in particulate matter and gas emissions, increases the share of clean and renewable energy sources, and cuts levels of both noise and waste. Finally, it promotes a healthy lifestyle, including rational and healthy eating.

However, this is an optimistic scenario that contends with plans and patterns of action based on well-known solutions, which in China do not provide much space for experimentation. A good example is the construction sector, which has thus far relied on low-cost technologies. More advanced, greener, and energy-efficient technology is flooding the market, creating new strategic challenges. Each investment in energy-efficient construction requires a separate approach, which makes the application of specific technical solutions dependent on various local circumstances. Such circumstances may include the location of potential investments, access to sunlight, and water and soil conditions. All of this con-

246 *World most polluted countries 2018 (PM2.5)*, https://www.airvisual.com/world-most-polluted-countries; *World most polluted cities 2018 (PM2.5)*, https://www.airvisual.com/world-most-polluted-cities?continent=&country=&state=&page=1&perPage=50&cities=; *2018 World Air Quality Report. Region & City PM2.5 Ranking*, IQAir AirVisual.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

tinues to make energy-efficient construction much more expensive than traditional construction and thus cannot be regarded as the new standard, but rather a kind of trend toward ecological solutions at best.

In addition to housing, the development of the transport sector poses similar challenges in urban areas. Transportation is not only a major energy consumer in cities, but also a source of harmful emissions. Achieving a state of sustainability in transport therefore requires, first and foremost, the construction of an integrated transportation network, promoting changes in individual and collective mobility, and reducing the negative environmental impact of transport, while promoting alternative, environmentally friendly methods of propulsion. Investment in transport infrastructure should not only meet higher technical requirements, but also be economically viable. In addition, it should achieve adequate environmental impact and maintain high energy efficiency. A separate challenge is to create spatial structures that are conducive to reducing demand for transportation. Hence, transport policy should be linked to the implementation of new technologies such as electromobility and thesharing economy.

The World Health Organization estimates that as many as 90 % of people around the world breathe polluted air. As of 2016, air pollution has been the cause of 7 million premature deaths worldwide every year, mainly as a result of increased mortality from acute respiratory infections, heart disease, stroke, chronic obstructive pulmonary disease, and lung cancer. According to WHO data, as much as 91 % of the world's population lives in areas with above-average levels of air pollution.[247] In this context, Tedros Adhanom Ghebreyesus, Director-General of the WHO, accurately stressed nobody – rich or poor – can avoid breathing the polluted air, which he called "the new tobacco." A clean and healthy environment is the most important prerequisite for good health. Since the world has turned its back on tobacco, Ghebreyesus now believes it has to do the same with the 'new tobacco' – the toxic air that billions of people breathe every day.[248]

Air pollution poses a serious threat not only to humans, but also to life on the entire planet. The combustion of fossil fuels (mainly coal) contributes the most to increasing air pollution while accelerating climate change. Public concern about the problem of environmental pollution is also growing. This is evidenced by a survey conducted by the Pew Research Center in 2015, in which more than three quarters of respondents in China (76 %) described air pollution as a problem,

247 Nada Osseiran / Christian Lindmeier, *9 out of 10 people worldwide breathe polluted air, but more countries are taking action*, World Health Organization, May 2, 2018, https://www.who.int/news-room/detail/02-05-2018-9-out-of-10-people-worldwide-breathe-polluted-air-but-more-countries-are-taking-action.

248 Tedros Adhanom Ghebreyesus, *Air pollution is the new tobacco. Time to tackle this epidemic*, "The Guardian", October 27, 2018, https://www.theguardian.com/commentisfree/2018/oct/27/air-pollution-is-the-new-tobacco-time-to-tackle-this-epidemic.

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including 35 % who regarded it as a "very big" problem and 41 % who deemed it a "big" one. A similar proportion of respondents (75 %) expressed concern about high water contamination, considering this problem as big (41 %) or very big (34 %). Respondents were pessimistic about the prospects for improvement with regard to air quality. Only slightly more than one third (36 %) of respondents thought that air quality would improve over the following five years, while 34 % were concerned that the situation would get worse and 22 % believed that the situation would not change. In the Pew Research survey, corruption among public officials elicited the most concern among Chinese respondents,[249] but it is significant that they placed air and water pollution in second and third place, respectively.[250]

The authorities in Beijing are aware that air pollution is a side effect of the rapid economic development and industrialization that China has experienced over the last four decades. The creation of an ecological civilization and the fight against pollution is therefore intended to reduce emissions of the main pollutants, curb consumption of coal, and reduce the concentration of fine particles suspended in the air that are harmful to human health. The authorities' determination to solve this problem as soon as possible is evidenced by Prime Minister Li Keqiang's statement during a parliamentary session in March 2014, in which he declared that the state is starting a war against environmental pollution, acting with the same determination it used to fight poverty. According to him, smog has triggered increased concern for the environment and human health. These measures are to focus on reducing the amount of harmful airborne particles, changing the industrial structure, increasing energy efficiency, reducing exhaust emissions, and preventing and monitoring the concentration of particulate matter in the atmosphere that is detrimental to human health.[251]

It is relevant to note that, in November 2014, China signed a climate agreement with the United States in Washington, DC. PRC President Xi Jinping declared at the time that China would reach its carbon emissions peak around 2030, but with the caveat that it would actively pursue measures to achieve it earlier. At the same time, he announced an increase in the share of non-fossil fuels in the total energy

249 George Gao, *As smog hangs over Beijing, Chinese cite air pollution as major concern*, Pew Research Center, December 10, 2015, https://www.pewresearch.org/fact-tank/2015/12/10/as-smog-hangs-over-beijing-chinese-cite-air-pollution-as-major-concern/.

250 Richard Wike / Bridget Parker, *Corruption, Pollution, Inequality Are Top Concerns in China*, Pew Research Center, September 24, 2015, https://www.pewglobal.org/2015/09/24/corruption-pollution-inequality-are-top-concerns-in-china/.

251 Zhengfu gongzuo baogao (政府工作报告), Xinhua (新华), Zhongyang zhengfu menhu wangzhan (中央政府门户网站), March 14, 2014, http://www.gov.cn/guowuyuan/2014-03/14/content_2638989.htm.

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balance to 20 %.[252] In addition, China committed to reducing CO_2 emissions per unit of GDP by 60–65 % by 2030, using 2005 as the base year.[253] China had already presented a target in 2009, during the 15th Conference of the Parties to the United Nations Framework Convention on Climate Change (COP 15), held on December 7–19, 2009 in Copenhagen. That target was to reduce CO_2 emissions per unit of GDP by 40–45 % by 2020 compared to 2005. The government also assured the international community that it would boost its share of non-fossil energy sources to 15 % in 2020 and enlarge the country's forested areas by 40 million hectares.[254]

In light of the above commitments, it is important to underline that climate policy has not unduly weakened the competitiveness of certain industries in China. The central government has focused primarily on improving energy efficiency. The emissions reduction plan presented to the public posited the use of an alternative methodology for reducing carbon dioxide emissions per unit of GDP. However, if GDP growth continued to crescendo, this did not necessarily mean that drastic changes would take place and could even lead to increased emissions. In this context, it is also relevant to note that China has not agreed to international monitoring of emissions. As the problem of air pollution remains the most acute in the north of the country, it is not surprising that the air quality improvement program primarily targeted cities such as Beijing and Tianjin, as well as cities in the provinces of Hebei, Shanxi, Shandong, and Henan. The guidelines for promoting and widely implementing clean heating solutions were operationalized largely by replacing coal with electric or gas heating.

On 10 September 2013, the State Council adopted an action plan on preventing pollution and conducting air quality control in China for the 2013–2017 period. Two key goals of this plan were to reduce coal consumption and shut down selected industrial plants. These measures were meant to contribute to significant improvements in urban air quality. The target for 2017 was to reduce harmful PM2.5 emissions in Beijing, Tianjin, and Hebei province by 25 %, in the Yangtze River delta by 20 %, and in the Pearl River delta by 15 % relative to 2012. In the remaining areas, the concentration of harmful PM10 was to fall by about 10 %. In the same period, the share of coal in primary energy consumption was to

252 *U.S.-China Joint Announcement on Climate Change and Clean Energy Cooperation*, The White House, Office of the Press Secretary, November 11, 2014, https://www.whitehouse.gov/the-press-office/2014/11/11/fact-sheet-us-china-joint-announcement-climate-change-and-clean-energy-c.

253 *Zhongguo xuanbu hou 2020 qihou mubiao: tan paifang qiangdu xiajiang 60 %–65 %* (中国宣布后2020气候目标：碳排放强度下降60 %–65 %), Beijixing jieneng huanbao wang (北极星节能环保网), July 1, 2015, http://huanbao.bjx.com.cn/news/20150701/636379.shtml.

254 OECD, *Climate Change Mitigation Policies and Progress: Policies and Progress*, OECD Publishing, Paris 2015, p. 38.

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be reduced to below 65 % and the share of non-fossil fuels increased to 13 %. The plan gave priority to the development of the gas and nuclear sectors.[255] Over the period in question, urban air pollution indeed decreased, although it should be noted that, in 2017, more than two-thirds of the 338 cities monitored still failed to meet even national air quality standards,[256] not to mention the more stringent standards of the World Health Organization.

In the next stage, which began in November 2014, the State Council presented an Energy Development Strategy for 2014–2020, which set the ceiling of primary energy consumption at 4.8 billion tons of carbon equivalent in 2020. The strategy placed an emphasis on reducing energy consumption per unit of GDP based on the use of more efficient, cleaner, and innovative solutions in energy production and consumption. The document presented a goal of reducing the share of coal in primary energy consumption to below 62 % over the period in question, with a simultaneous increase in the use of renewable resources and natural gas to 15 % and 10 %, respectively. With regard to the gas sector, the strategy highlighted the need to expand exploration for conventional deposits in the Sichuan basin, Ordos, Tarim, and the South China Sea. Furthermore, it put forward a target for increasing domestic production of natural gas to 185 billion m^3 per year, that of shale gas to 30 billion m^3, and that of coalbed methane (CBM) to 30 billion m^3.[257]

Also in 2014, the National Development and Reform Commission presented its opinion on the establishment of a long-term mechanism to ensure a stable supply of natural gas. It envisaged increasing gas supplies to 400 billion m^3 (or 420 billion m^3) per year by 2020 as well as securing gas supplies to the residential sector, including households, utilities, and local bus and taxi transport. In connection with ongoing projects to replace coal with natural gas by 2020, the Commission also described a plan to replace coal-fired boilers with gas in the industrial sector as well as an action plan to meet the demand for gas, which is estimated at 112 billion m^3 per year. At the same time, the Commission declared its political support for the following initiatives: developing a non-traditional gas sector, comprising mainly shale gas; implementing projects to replace coal with natural gas; increasing gas storage capacity; improving management of supply

255 Guowuyuan guanyu yinfa daqi wuran fangzhi xingdong jihua de tongzhi (guofa [2013] 37 hao) (国务院关于印发大气污染防治行动计划的通知 (国发 [2013] 37号), Zhongyang zhengfu menhu wangzhan (中央政府门户网站), September 10, 2013, http://www.gov.cn/zwgk/2013-09/12/content_2486773.htm.

256 Zhonghua renmin gongheguo 2017 nian guomin jingji he shehui fazhan tongji gongbao (中华人民共和国2017年国民经济和社会发展统计公报), Guojia tongji ju (国家统计局), February 28, 2018, http://www.stats.gov.cn/tjsj/zxfb/201802/t20180228_1585631.html.

257 Guowuyuan bangongting guanyu yinfa nengyuan fazhan zhanlüe xingdong jihua (2014–2020 nian) de tongzhi (guo ban fa [2014] 31 hao) (国务院办公厅关于印发能源发展战略行动计划（2014–2020年）的通知 (国办发 [2014] 31号)), Guowuyuan bangongting (国务院办公厅)), June 7, 2014, http://www.gov.cn/zhengce/content/2014-11/19/content_9222.htm.

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and demand for gas; avoiding 'unplanned' projects in the framework of the transition from coal to gas, particularly those related to increasingly stringent controls on the construction of new gas-fired power plants; and reforming the natural gas market, whose main facet is granting third-party access to pipelines and LNG terminals; and liberalizing the gas pricing system.[258]

The amendment to the Law on Prevention and Control of Air Pollution (大气污染防治法) of September 5, 1987[259], adopted on August 29, 2015 and in force since January 1, 2016, provides the legal basis for 2013's action plan on preventing pollution. The new solutions captured in this amendment emphasized the importance of the regional system for pollution prevention and control (Article 2). The law increased the responsibility of local authorities at various levels for air quality in their jurisdiction. It also obliged them to increase support for financial investments geared toward combatting air pollution (Articles 3, 4, 5). The central government committed to supporting scientific and technological research on the prevention and control of air pollution (Article 6). Companies, institutions, and other manufacturers and operators are obliged to implement effective air pollution control measures. The principle of liability for damage caused to air quality was also introduced. At the same time, the amendment imposes a duty on citizens to raise their own awareness of environmental issues and to lead low-carbon and cost-effective lifestyles (Article 7). Finally, it establishes a mechanism for joint control, prevention, and coordination of air pollution in key regions (Article 86).

These anti-pollution measures have given environmental inspectors greater enforcement powers over those generating environmental damage, including local authorities who often provide them with protection. However, it is notable that no specific benchmarks have been set for reducing coal consumption. It is also significant that the text of the law often includes phrases such as "*the state shall…*," "*the state will…*," and "*local governments shall take measures to…*", which may indicate the absence of a timetable or specific action plan in the area

258 Guanyu jianli baozhang tianranqi wending gongying chang xiao jizhi de ruogan yijian (guobanfa [2014] 16 hao) (关于建立保障天然气稳定供应长效机制的若干意见 (国办发[2014] 16号), Zhongyang zhengfu menhu wangzhan (中央政府门户网站), April 14, 2014, http://www.gov.cn/zhengce/content/2014-04/23/content_8777.htm.

259 Zhonghua renmin gongheguo daqi wuran fangzhi fa (2015 xiuding) (中华人民共和国大气污染防治法（2015修订）, Quanguo renda changwei hui (全国人大常委会), August 29, 2015, https://baike.baidu.com/item/%E4%B8%AD%E5%8D%8E%E4%BA%BA%E6%B0%91%E5%85%B1%E5%92%8C%E5%9B%BD%E5%A4%A7%E6%B0%94%E6%B1%A1%E6%9F%93%E9%98%B2%E6%B2%BB%E6%B3%95%EF%BC%882015%E4%BF%AE%E8%AE%A2%EF%BC%89/22385549?fr=aladdin.

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in question. Above all, however, there are no legal instruments derived from generally applicable legislation to punish polluters or force them to take action.[260]

The next step in the fight for clean air was taken in March 2017, when the Ministry of the Environment presented a plan for the prevention and control of air pollution in Beijing, Tianjin, and the 26 major cities of Hebei, Shanxi, Shandong, and Henan (2+26).[261] It focused on strengthening the responsibility of local authorities for environmental issues and highlighted the need to develop natural gas and electricity supply networks in connection with the policy of replacing coal with gas and electricity.[262] The activities and guidelines outlined in this plan corresponded with the substance of Prime Minister Li Keqiang's statement in early March of the same year, in which he spoke about promoting clean heating solutions such as replacing coal with gas or electricity in 3 million households and the total elimination of small coal-fired boilers in urban areas.[263]

Several months later, in December 2017, the State Council declared that it would lead "three great battles" (三大攻坚战, *san da gongjianzhan*) by the end of the decade: risk reduction in the financial sector, eradication of poverty, and prevention of pollution. On the last point, the government announced changes in the industrial structure, limiting production over capacity, and leading the fight for "blue skies."[264] At the same time, China presented a five-year plan to promote clean heating in the north of the country, which envisaged an increase in such heating solutions from 34 % in 2017 to 50 % in 2019 and 70 % from 2021 onwards. In the most polluted areas – Beijing, Tianjin, and the 26 cities in Hebei, Shanxi, Shandong, and Henan (2+26) – this target was set to 100 % by 2021. For com-

260 Liu Qin (刘琴), *Zhongguo banbu xin "daqi wuran fangzhi fa"* (中国颁布新《大气污染防治法》), Chinadialogue (Zhongwai duihua 中外对话), September 4, 2015, https://www.chinadialogue.net/article/show/single/ch/8156-China-s-new-Air-Pollution-Law-omits-key-measures-in-war-on-smog.

261 2+26 includes Beijing, Tianjin, 8 cities in Hebei Province (Shijiazhuang, Tangshan, Baoding, Langfang, Cangzhou, Hengshui, Handan, Xingtai), 4 cities in Shanxi Province (Taiyuan, Yangquan, Changzhi, Jincheng), 7 cities in Shandong Province (Jinan, Zibo, Liaocheng, Dezhou, Binzhou, Jining, Heze), and 7 cities in Henan Province (Zhengzhou, Xinxiang, Hebi, Anyang, Jiaozuo, Puyang, Kaifeng).

262 *Huanjing baohu bu fabu 2017 nian 3 yue he di 1 jidu "2+26" chengshi huanjing kongqi zhiliang zhuangkuang* (环境保护部发布2017年3月和第1季度"2+26"城市环境空气质量状况), Huanjing baohu bu wangzhan (环境保护部网站), April 5, 2017, http://www.gov.cn/xinwen/2017-04/05/content_5183575.htm.

263 *Li Keqiang: 2017 nian jiang quanbu taotai diji yishang chengshe jiancheng qu ranmei xiao guolu* (李克强：2017年将全部淘汰地级以上城市建成区燃煤小锅炉), Renmin wang (人民网), March 5, 2017, http://finance.people.com.cn/n1/2017/0305/c1004-29124283.html.

264 *Xinhua she pinglunyuan: Jianjue da ying san da gongjianzhan — si lun xuexi guanche zhongyang jingji gongzuo huiyi jingshen* (新华社评论员：坚决打赢三大攻坚战——四论学习贯彻中央经济工作会议精神), Xinhua (新华), December 23, 2017, http://www.xinhuanet.com/politics/2017-12/23/c_1122157464.htm.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

parison, when the policy was announced, 83 % of the winter heating solutions in those areas were based on coal, while clean energy sources – i. e. natural gas, electric heating, geothermal energy, biomass, solar energy, heat obtained from waste disposal – constituted only 13 %.[265]

These initiatives were complemented by the 2018–2020 Three-year Action Plan for Winning the Blue Sky War (打赢蓝天保卫战, *daying lantan baoweizhan*; often shorted to Three-year Action Plan), presented by the State Council in July 2018, with the necessary economic, legal, technical and administrative measures to facilitate its implementation. These activities focus mainly on the Beijing-Tianjin-Hebei area, the Yangtze River delta, and the Fen-Wei Plain[266] in the Shanxi, Shaanxi, and Henan provinces, where air pollution is highest. The government believes the implementation of these measures will allow them to reduce the emission of greenhouse gases and air pollution that are contributing to the formation of smog within three years. At the same time, the government announced that it would promote green industrial development, which entails strict control of production capacity in resource-intensive and highly polluting industries. The plan predicts changes in the energy mix by reducing coal consumption while increasing the share of gas and promoting clean energy sources. It also stresses the importance of developing clean transportation, optimizing land use patterns, controlling air pollution in key regions, and strengthening regional cooperation on controlling air pollution.[267]

These actions are a response to the unsatisfactory results of the previous plan (ending in 2017), which prompted the Beijing government to expand its activities in the north of the country (Beijing-Tianjin-Hebei and neighboring areas). So far, the most tangible and rapidly achieved effect has been the reduction of SO_2 and NO_x emissions, which resulted from the introduction of the obligation to install electrostatic precipitators and the construction or modernization of NO_x and SO_2 reduction installations in large power plants and industrial facilities. However, the effort to reduce PM2.5 emissions has been considerably less effective; this process should be more comprehensive from the outset and cover all sectors, including transport in particular. As such solutions require long-term action,

265 Beifang diqu dongji qingjie qunuan huihua (2017–2021) (北方地区冬季清洁取暖规划 (2017–2021)), Guojia fazhan he gaige weiyuanhui (国家发展和改革委员会), December 2017, http://www.gov.cn/xinwen/2017-12/20/5248855/files/7ed7d7cda8984ae39a4e9620a4660c7f.pdf.

266 This is the area in the north of the country between the Weihe River (right tributary of the Yellow River) in the provinces of Gansu and Shaanxi, and the Fenhe River (left tributary of the Yellow River) in Shanxi Province.

267 Guowuyuan guanyu yinfa daying lantian baowei zhan san nian xingdong jihua de tongzhi (guo fa [2018] 22 hao) (国务院关于印发打赢蓝天保卫战三年行动计划的通知 (国发[2018] 22号)), Zhongyang zhengfu menhu wangzhan (中央政府门户网站), July 3, 2018, http://www.gov.cn/zhengce/content/2018-07/03/content_5303158.htm.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

reducing coal consumption and gradually spreading clean heating solutions seems to be a step in the right direction. The advantage of the new plan is that it draws on the experience of the previous one. Indeed, evaluations and studies carried out over the last few years have identified the main sources of smog, especially on a sector-by-sector level, which makes it possible to make greater use of new technological solutions and apply specialized methods of operation.

According to information disseminated by Minister of Ecology and Environment Li Ganjie, the percentage of days with good air quality in 338 cities at the prefecture level and higher in 2018 was 79.3 %, and the concentration of PM2.5 decreased by 9.3 %. The latter fell by 11.8 % in the Beijing-Tianjin-Hebei region, 10.8 % in the Yangtze River delta and the Fen-Wei Plain, and 12.1 % in Beijing alone.[268] Nevertheless, we should not forget that two-thirds of the 338 cities mentioned above still fail to meet the PM2.5 standard of 35 μg/m³, whereas the proposed three-year action plan applies to all these cities. By comparison, the 2013 action plan only set PM2.5 targets for Beijing-Tianjin-Hebei and the Pearl River and Yangtze River delta areas. The new plan has therefore significantly extended the scope of the restrictions on PM2.5 – and thus the list of cities that have not previously been subject to strong pressure to combat air pollution. At the same time, however, it is necessary to note that no new quantitative targets have been set in relation to those made in the 13th Five-Year Plan.

Another problem is that some cities made significant progress in reducing air pollution during the first action plan, which does not motivate them sufficiently to take more ambitious measures in the new cycle. In many cases, the objectives of the plan are more limited than those that the cities themselves set in their five-year plans. It is worth noting, however, that cities which previously were not covered by the requirements imposed by the central plan will now have to improve their air quality. The plan describes the Fen-Wei Plain as a "key area" and the most important (重点区域, *zhongdian quyu)* in the fight for the 'blue sky,' whereas previously this "key" status was attributed to the Pearl River delta. The fact that this designation was chosen for Fen-Wei is not surprising given that the plain experiences the highest levels of sulfur dioxide pollution in the country as well as a high concentration of PM2.5 particles. This can be traced to the region's strong reliance on coal as well as the dominance of heavy industry.

The Environmental Protection Tax Law (环境保护税法), which was adopted on December 25, 2016 and entered into force on January 1, 2018, is also part of the

268 *Li Ganjie: lantian baowei zhan zongti shang jinzhan he chengxiao bucuo dan hai renzhong daoyuan* (李干杰：蓝天保卫战总体上进展和成效不错但还任重道远), Xinhua (新华), Zhongguo zhengfu wang (中国政府网), March 11, 2019, http://www.xinhuanet.com/politics/2019lh/2019-03/11/c_137886062.htm.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

toolbox used in the fight for clean air.[269] The law introduced a cohesive, nationwide tax system for companies that cause environmental pollution, replacing a previous system that relied on 'pollution charges', which has been in place since 1979. Prior to this adoption of this law, local authorities had determined the rates at which such companies should be charged, although 10 % of the fees always went to the central budget. However, provincial authorities exploited loopholes in this system by imposing low charges or exempting companies whose activities were important for the local economy. In this case, it was commonly believed that important goal was to achieve high economic growth, which for a long time was the basic criterion for evaluating the activities of local authorities. The new rules increased the autonomy of local governments to define the tax rates to be levied within a centrally established range, with consideration given to the existence of different environmental conditions and challenges in each region. The resulting taxes are applied in four categories: air pollution, water pollution, solid waste, and noise (Table 10).[270]

Table 10. Taxable subjects, taxable objects and tax base

Taxable item	Tax unit	Tax rate
Atmospheric pollutants	per pollution equivalent	1.2–12 RMB (0.17–1.7 USD)
Water pollutants	per pollution equivalent	1.4–14 RMB (0.19–1.9 USD)
Solid waste by type	per ton	5–1000 RMB (0.7–140 USD)
Noise	Decibels	350–11200 RMB (49–1568 USD)

Source: *Huanbao shuifa shishi lüse fazhan tisu* (环保税法实施绿色发展提速), Zhongyang zhengfu menhu wangzhan (中央政府门户网站), January 11, 2018, http://www.gov.cn/zhengce/2018-01/11/content_5255478.htm

At the end of 2017, Prime Minister Li Keqiang signed a decree under which pollution charges would be paid in full to local budgets.[271] This is intended to motivate local authorities to become more involved in pro-environmental activities. In turn, the granting of tax reliefs is intended to contribute to raising

269 Zhonghua renmin gongheguo huanjing baohu shuifa (中华人民共和国环境保护税法), Quanguo renmin daibiao dahui (全国人民代表大会), December 25, 2016, http://www.chinatax.gov.cn/n810341/n810755/c3348910/content.html.

270 *Huanbao shuifa shishi lüse fazhan tisu* (环保税法实施绿色发展提速), Zhongyang zhengfu menhu wangzhan (中央政府门户网站), January 11, 2018, http://www.gov.cn/zhengce/2018-01/11/content_5255478.htm.

271 Guowuyuan guanyu huanjing baohu shui shouru guishu wenti de tongzhi (国务院关于环境保护税收入归属问题的通知), Guowuyuan (国务院), December 22, 2017, http://www.gov.cn/zhengce/content/2017-12/27/content_5250841.htm.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

awareness of the need to reduce pollution among businesses. The next measure, deployed in November 2018 by the Ministry of Finance and the State Administration of Taxation, was a draft of the Resource Tax Law of the PRC (中华人民共和国资源税法, 征求意见稿), whose goal was to support the responsible use of natural resources and environmental protection.[272] Between 1994 and 2017, resources taxes totaled 932.5 billion RMB (approximately 130.5 billion USD).[273] The new system maintained the existing method of determining the tax rate on mineral resources and salt. Originally, the mineral resource tax, introduced in 1984, applied to oil, natural gas, coal, and other mineral resources, with quantity and weight as a tax base. In 2011, the government launched a reform process that replaced the quantitative criterion with a calculation of the *ad valorem* tax on the basis of the price of raw materials, including oil, coal, gas, rare earths, and molybdenum and tungsten. However, the reform resulted in an increase in production costs for mining companies (primarily foreign operators) due to the fact that prices of natural resources have been steadily rising in China in recent years.

The measures taken by the central government create hope for a reduction in harmful air pollution in the future. However, this will require patience, as air pollution levels remain very high in many regions of China. The spatial distribution of pollutant emissions remains very uneven. This is particularly evident in the northeast of the country, where pollution levels significantly exceed the standards set by the WHO. This problem affects the urban population as much as it does rural people, who live in close proximity to industrial centers and polluted cities. Finally, it is impossible to ignore that the continuing dependence of households on fossil fuels remains a major problem.

2.2 Water protection and management

Water resources are the foundation for the survival of mankind. At the same time, they are an essential condition for sustainable development as well as the proper functioning of agriculture, industry, and households. They allow ecological processes, regional ecological well-being, and the functions of the ecosystem's natural structures to be preserved. However, socioeconomic development and China's growing population have resulted in a sharp increase in demand for

272 Zhonghua renmin gongheguo ziyuan shuifa (zhengqiu yijian gao) (中华人民共和国资源税法(征求意见稿), Caizheng bu (财政部), Guojia shuiwu zongju (国家税务总局), November 20, 2017, http://tfs.mof.gov.cn/zhengwuxinxi/zhengcefabu/201711/t20171120_2753984.html.

273 *Chinese lawmakers highlight role of resource tax in conservation*, Xinhua, December 27, 2018, http://www.xinhuanet.com/english/2018-12/27/c_137702223.htm.

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water. This is problematic because the water supply in the basins of the country's seven major rivers is limited, especially in the northern regions of the Middle Kingdom. This is not the only problem China is facing insofar as water management is concerned. The uncontrolled release of industrial and municipal wastewater over the years as well as the abuse of pesticides and fertilizers in agriculture have led to serious pollution of surface and ground water resources. As a result, more than half of the seven water systems in China are contaminated.

Recognizing this challenge, in April 2015, China presented a Water Pollution Prevention and Control Action Plan (水污染防治行动计划), known as the Water Ten Plan (水十条). The plan focuses on prevention and control of industrial and agricultural pollution, economic transformation (including industrial transformation), resource conservation, and recycling. It also refers to scientific and technological progress, the application of market mechanisms and enforcement of legal regulations, and the importance of improving water management and safety as well as social control and supervision. In addition, it stipulates that the responsibility of local authorities for the quality of the water environment in their jurisdictions be increased. The overall objectives and targets highlight the need to gradually improve the quality of the aquatic environment by 2020.[274]

According to the stipulations of the Water Ten Plan, more than 70 % of the waters of the country's seven main rivers (Changjiang/Yangtze), Yellow River/Huanghe, Zhujiang, Songhuajiang, Huaihe, Haihe, Liaohe are expected to reach Grade III or higher. The Plan foresees that the same levels will be achieved for more than 93 % of municipal drinking water sources. The share of *extremely poor water quality groundwater is* to remain below 15 % across the country. At the same time, 70 % of coastal waters are expected to reach Grade I or II. The plan also envisaged the improvement of the state of the water environment in cities located in key regions. The proportion of water of the worst quality (Grade V+) in the Beijing-Tianjin-Hebei region was to decrease by 15 %. By 2030, more than 75 % of the water in the Yangtze and Pearl River basins is expected to achieve *excellent* or *good* quality. In the same time frame, the government plans to eliminate 'black and odorous waters' (黑臭水体, *hei chou shuiti*) in Chinese cities. Furthermore, 95 % of centralized sources of drinking water in cities is expected to achieve a water quality grade higher than III. The plan also places great emphasis on conservation and efficient use of water resources, especially in the industrial and agricultural sectors. By 2020, the government expects that total

274 Guowuyuan guanyu yinfa shui wuran fangzhi xingdong jihua de tongzhi (guo fa [2015] 17 hao) (国务院关于印发水污染防治行动计划的通知 (国发 [2015] 17号), Guowuyuan (国务院), April 16, 2015, http://www.gov.cn/zhengce/content/2015-04/16/content_9613.htm.

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national annual water consumption should not exceed a control level of 670 billion m^3.[275]

Identifying the main water protection problems in China reveals, on the one hand, the uneven geographical distribution of water resources and, on the other hand, the problem of water scarcity. Therefore, it is not surprising that the Plan stresses the importance of protecting water sources, including both groundwater and surface water. In the case of the former, the Plan concentrates on seven major rivers, which are the primary source of drinking water in China, since the majority of the country's population and industry are concentrated in the Beijing, Tianjin, and Hebei areas as well as the Yangtze and Pearl River deltas. Thus, for these zones, stringent targets have been set for a relatively short period of time. In view of already palpable water shortages, the Plan highlighted the need to restructure industry and agriculture. Within this scope, it identified the sectors that are primarily responsible for existing pollution and the intensive use of water resources. The plan therefore provides for inspections to be carried out in the industries responsible for causing or exacerbating environmental damage, setting emissions limits and ensuring close monitoring by authorities and the public.

Another element of the Plan was the introduction of a requirement to publish information on water quality. It is worth recalling that, in January 2016, the Ministry of Environmental Protection issued an order obligating local authorities to disclose data from water quality monitoring. The new stipulations require timely disclosure of such information to the public through the websites of environmental departments and local environmental monitoring agencies. In the context of the proposed solutions, the introduction of controls regarding total water consumption was also an important step. The water consumption limit was tethered to measures that aimed to improve the efficiency of water management and to the implementation of a number of market mechanisms. The latter were related to the restructuring of water consumption charges and the introduction of environmental compensation schemes.

Based on the national integrated drinking water quality monitoring plan (全国集中式生活饮用水水源地水质监测实施方案), information about the quality of water in 338 cities at the prefectural level and 2856 administrative units at the district level is published quarterly, starting from 2018.[276] This is a response to the questionable reliability of the water quality data provided by local authorities and companies to date. As early as November 2014, Prime Minister Li Keqiang

275 *Ibidem.*

276 *2856 ge chengzhen yinyong shui yuan shuizhi xinxi jinnian qi jiang an jidu gongkai* (2856个城镇饮用水源水质信息今年起将按季度公开), Zhongguo xinwen wang (中国新闻网), February 2, 2018, http://www.xinhuanet.com/city/2018-02/02/c_129804012.htm.

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publicly recognized this problem by calling for an end to the publication of false information on the safety of drinking water. At the time, he spoke of the need to introduce external evaluation of official data on the safety of drinking water in order to stop such abuses. He also drew attention to the problem consolidated standards and the need for coordination in this respect, given that the Ministry of Water Resources, which is responsible for managing water resources in the country, had as many as five departments that were jointly responsible for water conservation (多龙治水, *duo long zhishui*).[277] In light of this, the Ministry of Environmental Protection defined the protocols and procedures to deal with the manipulation and falsification of environmental monitoring data. Finally, on January 1, 2016, the Ministry introduced procedures to record and register accurate, truthful, and precise data.[278]

Surface water constitutes 82 % of China's total water supply. Although groundwater accounts for only 18 % of this balance, the uneven distribution of water resources between the north and south means that the north remains far more dependent on groundwater than the south. Data disclosed by the Ministry of Water Resources in 2016 clearly indicate that groundwater in the country is generally of "poor quality." This was confirmed by monitoring data from 2015. Out of 2,103 sets of groundwater samples – collected in Songliao Plain, the Huanghuaihai region, Shanxi Province, and areas in the northwest as well as Jianghan Plain – 691 (32.9 %) were Grade IV and 994 (47.3 %) were Grade V. None of the samples achieved Grade I, while only 418 (19.9 %) were classified as Grade II or III.[279]

The scale of the problem is evidenced by the fact that more than 400 of the 657 cities in the country use groundwater as a source of drinking water, which means that about 70 % of the country's population consumes this water. This is based on statistics from the Ministry of Land and Resources, which is responsible for the management, protection and exploitation of natural resources. 50 % of

277 *Li Keqiang duzhan "duo long zhishui" qiangdiao fangfan yinshui anquan shuju zao* (李克强督战"多龙治水"强调防范饮水安全数据造), Meiri jingji xinwen (每日经济新闻), November 26, 2014, http://www.nbd.com.cn/articles/2014-11-26/878323.html.

278 Guanyu yinfa "huanjing jiance shuju nongxu zuojia xingwei panding ji chuli banfa" de tongzhi, (huan fa [2015] 175 hao) (关于印发《环境监测数据弄虚作假行为判定及处理办法》的通知, (环发 [2015] 175号), Huanjing baohu bu (环境保护部), December 29, 2015, http://www.mee.gov.cn/gkml/hbb/bwj/201512/t20151230_320804.htm?keywords=%E5%85%B3%E4%BA%8E%E5%8D%B0%E5%8F%91%E3%80%8A%E7%8E%AF%E5%A2%83%E7%9B%91%E6%B5%8B%E6%95%B0%E6%8D%AE%E5%BC%84%E8%99%9A%E4%BD%9C%E5%81%87%E8%A1%8C%E4%B8%BA%E5%88%A4%E5%AE%9A%E5%8F%8A%E5%A4%84%E7%90%86%E5%8A%9E%E6%B3%95%E3%80%8B%E7%9A%84%E9%80%9A%E7%9F%A5.

279 *Shuili bu modi dixiashui ziyuan: bacheng buneng yinyong* (水利部摸底地下水资源：八成不能饮用), Meiri jingji xinwen (每日经济新闻), April 11, 2016, http://www.nbd.com.cn/articles/2016-04-11/996946.html.

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the water use in industry is groundwater, as is 33 % of water used for agricultural purposes. Groundwater also constitutes 65 % of all water used for everyday household purposes. Over 600 cities experience water scarcity at varying levels. This is primarily due to overexploitation of groundwater, which causes the groundwater level to gradually decrease. Land subsidence caused by reckless and unfettered exploitation of groundwater has been observed to varying degrees in more than 70 cities in China. This problem hits urban agglomerations such as Shanghai, Tianjin, and Taiyuan particularly hard. In many regions in the north of the country, overexploitation of groundwater has caused cracks in the substrate, posing a serious threat to urban infrastructure. At the same time, studies have shown that direct economic losses caused by land subsidence in the China Plain area amounted to more than 40 billion RMB (approximately 5.6 billion USD) and indirect economic losses totaled more than 292 billion RMB (approximately 40.8 billion USD).[280]

In the dry and semi-dry regions of the world, the groundwater in almost all major aquifers is rapidly depleting. According to the UN, China possesses only 7 % of the world's freshwater resources. This problem is particularly noticeable in the north of the country.[281] However, the loss of water resources is not only the result of climate change associated with frequent and intensive droughts, but also largely derives from human activity, particularly overexploitation of resources – for instance, for the purpose of artificially irrigating farmlands. In response to these pressing problems, on December 1, 2017, China implemented a pilot scheme to establish a levy on the consumption of water resources in nine provinces and regions. Under this scheme, companies and individuals responsible for excessive water consumption are to be charged a fee. The plan encompassed Beijing, Tianjin, Shanxi, Inner Mongolia, Shandong, Henan, Sichuan, Shaanxi, and Ningxia, with the option of extending to the whole country in the long run.[282]

280 *Dixiashui: chao cai he wuran zhi you* (地下水：超采和污染之忧), Zhongguo guotu ziyuan bao (中国国土资源报), April 20, 2012, http://www.mnr.gov.cn/zt/hd/dqr/43earthday/zygq/201204/t20120420_2057247.html.

281 *Water and Energy Sustainability*, 2014, https://www.un.org/waterforlifedecade/pdf/01_2014_sustainability_eng.pdf.

282 Guanyu yinfa "kuoda shui ziyuan shui gaige shidian shishi banfa" de tongzhi (caishui [2017] 80 hao) (关于印发《扩大水资源税改革试点实施办法》的通知 (财税 [2017] 80号), Caizheng bu shuiwu zongju shuili bu (财政部税务总局水利部), November 24, 2017, http://szs.mof.gov.cn/zhengwuxinxi/zhengcefabu/201711/t20171128_2761431.html.

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Table 11. Minimum average water tax in the pilot regions

Provincial level (provinces, autonomous regions, provincial-level cities)	Minimum average tax on surface water	Minimum average groundwater tax
Beijing	1.6	4
Tianjin	0.8	4
Shanxi	0.5	2
Inner Mongolia	0.5	2
Shandong	0.4	1.5
Henan	0.4	1.5
Sichuan	0.1	0.2
Shaanxi	0.3	0.7
Ningxia	0.3	0.7

* 1 yuan (USD 0.14) per m³)
Source: Guanyu yinfa "kuoda shui ziyuan shui gaige shidian shishi banfa" de tongzhi (caishui [2017] 80 hao) (关于印发《扩大水资源税改革试点实施办法》的通知 (财税 [2017] 80号), Caizheng bu shuiwu zongju shuili bu (财政部税务总局水利部), November 24, 2017, http://szs.mof.gov.cn/zhengwuxinxi/zhengcefabu/201711/t20171128_2761431.html

2.3 Soil contamination and methods of preventing soil degradation

Just as the rapid expansion of urban infrastructure in China has led to a significant increase in the amount of urban wastewater that pollutes the groundwater, so too has it contributed to the degradation of the soil. This is the result of the exploration of areas in search of raw materials, their extraction, and, above all, the use of artificial fertilizers in agriculture. The large-scale use of fertilizers and pesticides has a number of negative consequences for farmland and groundwater.[283] The quality of soils and their level of contamination directly affects the food people eat and, consequently, human health and life. Unlike air and water pollution, which can be seen and felt, soil contamination is usually hidden. This explains why the central authorities in Beijing addressed this problem relatively late. Moreover, the information that is disclosed on soil contamination is incomplete, as opposed to air pollution data, which is disseminated consistently. We can assume that soil contamination can pose a higher risk to the population than other forms of contamination, as it is less tangible and consumers do not know how to protect themselves against it.

According to Ma Jun, director of the Institute for Public and Environmental Affairs, the government does not make its information available in this area

283 *Dixiashui: chao cai he wuran zhi you…, op.cit.*

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precisely for fear of creating social panic. On the other hand, Yan Yijun from the Research Center for Air Pollution and Health at Zhejiang University (浙江大学空气污染与健康研究中心) has stressed that relatively low soil contamination generates risks that are often overlooked. Long-term exposure to low concentrations of contaminants can cause significant health damage.[284] Given that the central authorities understand that the rehabilitation of contaminated soils will be a long-term process, they are even more inclined to opt for the "orderly release" of information in this regard, as noted by Gao Shengda, editor of China Environmental Remediation (中国环境修复产业联盟).[285]

Recently released data from the Ministry of Ecology and Environment and the Ministry of Land and Resources indicated in 2014 that 16.1 % of Chinese soils exceeded permissible levels of pollution. 19.4 % of arable land, 10 % of forest land, 10.4 % of meadows, and 11.4 % of wastelands were contaminated.[286] Yet these data do not fully reflect the actual situation. According to Gao Shengda, there are between 300,000 and 500,000 contaminated areas in China. Nevertheless, domestic investment in the reclamation of contaminated land accounted for only slightly more than 2 billion RMB (about 280 million USD) in 2015, representing only 0.03 % of China's GDP. Due to limited funding, national soil remediation projects have so far focused mainly on construction sites in city centers. To date, efforts to determine who is liable for the effects of soil contamination have been inconclusive. Polluting actors usually make "quick repairs", which unfortunately triggers the danger of secondary environmental hazards.[287]

Following three years of preparation, a plan was finally drawn up that sets out various forms of integrated pollution prevention, control, and assessment. On May 31, 2016, the State Council adopted an Action Plan for Prevention and Control of Soil Pollution (土壤污染防治行动计划). According to its stipulations, preliminary evaluations of the condition of the country's soils will be completed by 2020. The quality of China's soil is expected to stabilize and improve across the country by 2030, while a comprehensive improvement in its condition is expected by mid-century. According to the Plan, by the end of 2020, 90 % of contaminated land in China (including both arable and other types of

284 *Changdi wuran dang yanli zhui ze* (场地污染当严厉追责（绿色家园）, "Renmin Ribao" (人民日报), May 7, 2016.

285 Zhang Chun, *Lack of Data, Openness Could Obstruct Soil Clean Up*, Chinadialogue (Zhongwai duihua 中外对话), June 14, 2016, https://www.chinadialogue.net/article/show/single/en/9009-Lack-of-data-openness-could-obstruct-soil-clean-up.

286 *Huanbao bu fabu gongbao: quanguo 19.4 % gengdi wuran wu chaobiao (tu)* (环保部发布公报：全国19.4 %耕地污染物超标(图), "Jinghua shibao" (京华时报), April 18, 2014, http://env.people.com.cn/n/2014/0418/c1010-24911320.html.

287 *Changdi wuran dang yanli zhui ze…*, *op.cit.*

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

land) must be safe for use, with a target of 95 % by 2030. The Plan also established a monitoring network for contaminated soils, created a typology of agricultural land according to its level of contamination, and increased protection for uncontaminated land. Finally, it emphasized the need to strengthen oversight with regard to tracking sources of pollution.

The Plan prioritizes strict control of industrial pollution and sources of contamination resulting from mining activities. It announced measures aimed at preventing and controlling industrial pollution of soils with heavy metals. Emissions of key heavy metals in critical sectors are to be reduced by 10 % by 2020 compared to 2013. In the context of controlling pollution in agriculture and the need for rational use of chemical fertilizers and pesticides, it is notable that the Plan encourages farmers to use organic fertilizers on a wider scale. In addition, it announces a commitment by the government to evaluate the pollution levels of agricultural lands in order to determine the appropriate extent and geographical scope of remediation efforts as well as the impact of pollution on agricultural products. The Plan also provides for scientific research related to soil protection and the strengthening of societal oversight by disclosing monitoring data related to soil quality.[288]

These ambitious goals cannot obscure the fact that the Plan follows a rather vague set of formulas. In particular, it does not define which standards will be used to assess different levels of pollution. Nor is it specified what "safe usage" of land actually means. Although the document refers to responsibility and liability for the effects of soil contamination, it does not specify exactly what form it will take. Nevertheless, the lack of information on the actual scale of pollution in the country is the biggest problem left unaddressed in the Plan. This undoubtedly makes it difficult for local authorities, businesses, and ordinary people to take effective action in this area.

Thus, the enactment of the Soil Pollution Prevention and Control Law (中华人民共和国土壤污染防治法[289]) of August 31, 2018 was a step in the right direction. This law, which entered into force on January 1, 2019, was the result of a plan to combat air and water pollution that had previously been presented by the government; at the same time, it fills the aforementioned responsibility gap by creating a comprehensive system of liability for the impact of soil contamination and responsibility for the removal of damage that has already occurred (Ar-

288 Guowuyuan guanyu yinfa turang wuran fangzhi xingdong jihua de tongzhi (guo fa [2016] 31 hao) (国务院关于印发土壤污染防治行动计划的通知 (国发 [2016] 31号), Guowuyuan (国务院), May 28, 2016, http://www.gov.cn/zhengce/content/2016-05/31/content_5078377.htm.

289 Zhonghua renmin gongheguo turang wuran fangzhi fa (中华人民共和国土壤污染防治法), Zhengtai huanjing bu (生态环境部), August 31, 2018, http://zfs.mee.gov.cn/fl/201809/t20180907_549845.shtml.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

ticles 45, 47, and 48). Based on the adopted statutory solutions, it is the Ministry of Ecology and Environment that sets national risk control standards for soil contamination and establishes a system of standards for the prevention and management of such contamination, which in turn is based on the level of contamination, the existing or potential threat to public health and ecosystems, and the current state of knowledge and technological development.

Local authorities have been empowered to implement additional mandatory standards that are stricter than those adopted at central level (Articles 11 and 12). The Ministry of Ecology and Environment, in cooperation with other ministries, was tasked with establishing a national information platform that presents data on the condition of the country's soils (Article 8). The Law pays particular attention to land use and construction projects that may affect soil contamination levels (Article 18). A nationwide survey on soil contamination is to be carried out at least every 10 years (Article 14). Article 15 underlines the importance of soil pollution monitoring. The Law also creates mechanisms whereby the central government can create so-called incentives for local authorities to set up their own funds for monitoring and preventing soil pollution.

Businesses, in turn, are obliged to take appropriate steps to prevent and control soil contamination, including the implementation of their own soil pollution monitoring systems (Articles 21 and 22). Finally, the Law draws attention to transparency and disclosure of soil contamination data (Article 21). The Act also stipulates the creation of an inventory of construction sites subject to risk control and reclamation (Article 59). In light of the newly introduced classification system for agricultural land management, the Act provides for three tiers of agricultural land management according to the following categories: priority protection, safe use, and strict control. Projects that threaten the soil are strictly prohibited on land designated as 'priority protection'. Other land falls under safe use plans and risk control assessments (Articles 50, 53, and 54). The Law also obliges envisions audits on the use of pesticides and fertilizers (Article 16) and obliges producers and users to recycle plastic waste used in agriculture (Article 30).

However, the effectiveness of such solutions will largely depend on whether the government is able to cover the enormous costs of corrective action. Expenditures on soil reclamation to date represent only 1 % of the total amount spent on environmental protection. The 2016 Action Plan called for increased government spending and the use of public-private partnerships, but this has had limited effects thus far.[290] At the same time, it is still unclear to what extent the private sector will want to get involved in this process. A report by Huatai Securities (华泰证券) published in April 2016 states that the cost of soil re-

290 Zhang Chun, *Lack of Data, Openness Could Obstruct Soil Clean Up*, *op. cit.*

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mediation and revegetation projects across the country envisaged under the 13th Five-Year Plan will amount to 590 billion RMB (about 82.6 billion USD).[291]

Nevertheless, this is only a fraction of the 7.4 trillion RMB (approximately 1 trillion USD) that Huatai believes will need to be spent to remediate and restore all degraded land in China.[292] It is worth noting that companies that deal with soil remediation and revegetation have enormous market potential; their value in 2013 was estimated at 1.3 billion RMB (about 182 million USD), while by 2017 it had increased tenfold to more than 15 billion RMB (about 2.1 billion USD). Financial forecasts state that the value of the sector will reach 86 billion RMB (around 12 billion USD) by 2024, with the rapidly growing number of registered soil remediation companies, of which there were 2,000 in 2016 and 2,800 a year later. However, despite these impressive data, soil revegetation technology is still in its nascent stage and should be viewed as an emerging industry.[293]

The Law also provides for the creation of special remediation funds that will provide local governments with a source of capital to take action on remediation in case of difficulties in identifying those responsible for pollution. Over the past decades, local authorities have often assumed the costs of repairing the damage, thus relieving companies responsible for environmental damage of liability for causing it. The official justification for this is often support for local employers. At this stage, it appears that local authorities will begin to play a greater role in financing soil remediation projects – for example, through *sustainable financing*, which combines environmental, social, and economic considerations. This would certainly unlock long-term effects that would be beneficial to both society and businesses – and, naturally, for the environment.

The highest echelons of government strive to set an example. In February 2018, Minister of Ecology and Environment Li Ganjie emphasized that China would make every effort to make about 90 % of its farmland safe for crops by the end of 2020, and that it would restrict development on a quarter of the country's territory. He also announced the creation of pilot zones to be used for testing technologies for preventing and treating soil pollution. In his speech, he also drew attention to the implementation of a pilot project whose aim was to build

291 *Turang xiufu: xunzhao xifen lingyu di quedingxing* (土壤修复：寻找细分领域的确定性), Huatai zhengquan (华泰证券), April 28, 2016, https://crm.htsc.com.cn/doc/2016/101208/35c1cd42-cc93-455a-a3a3-29f3cb70e371.pdf.

292 *Ibidem.*

293 *2019 nian woguo turang xiufu hangye shichang guimo: 5 niannei youwang dadao 860 yi yuan* (2019年我国土壤修复行业市场规模：5年内有望达到860亿元), Zhongguo baogao wang (中国报告网), June 28, 2019, http://free.chinabaogao.com/gonggongfuwu/201906/062T292Z2019.html.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

"no-waste cities" (无废城市, *wufei chengshi*).[294] In January 2019, Li Ganjie, while maintaining the government's commitment to carry out further detailed research on the agricultural land pollution, announced further activities related to the construction of six major integrated soil pollution prevention and control areas as well as the implementation of more than 200 pilot projects implementing a variety of technologies for curbing and limiting soil pollution.[295]

The authorities are aware that the problem of soil contamination may amplify broader public concern due to its close correlation with human health and life. Thus, they are refraining from making concrete data on contaminated sites public. As a result, mapping out areas according to pollution risk in key industrial areas remains a major challenge. Indeed, details about the contaminated sites that were included in the 2006–2010 survey and the problems that derive from their contamination have never been published. Related disclosure only include possible sources of pollution, but not specific locations with a specific degree of pollution assigned to them. Thus, we have yet to assess the effectiveness of newly adopted measures that oblige local authorities to draw up lists of companies subject to environmental monitoring. Those on the list must monitor pollution levels in areas where they operate and make the results public, but this is only a small slice of the full picture.

2.4 Waste management

According to the World Bank's *What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050,* 2.01 billion tons of waste were produced worldwide in 2016. However, without appropriate action, this figure could rise to 2.59 billion tons in 2030 and 3.40 billion tons by the middle of the 21st century.[296] The largest categories of waste on a global level are food waste and 'green' waste. Organic waste accounts for almost half (44 %) of total waste produced worldwide. Another 38 % is composed of recyclable solid waste, i. e. plastic, paper and cardboard, metal, and glass. In 2016, plastics accounted for 12 % of all solid waste, amounting to 242 million tons of plastic waste. The East Asia-Pacific region

294 *Quanguo huanjing baohu gongzuo huiyi zaijing zhaokai* (全国环境保护工作会议在京召开), Huanjing baohu bu wangzhan (环境保护部网站), February 4, 2018, http://www.gov.cn/xinwen/2018-02/04/content_5263781.htm.

295 *Quanguo shengtai baohu gongzuo huiyi zaijing zhaokai* (全国生态环境保护工作会议在京召开), Shengtai huanjing bu (生态环境部), January 19, 2019, http://www.mee.gov.cn/xxgk2018/xxgk/xxgk15/201901/t20190119_690169.html.

296 Silpa Kaza / Lisa Yao / PerinazBhada-Tata / Frank Van Woerden, *What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050*, World Bank, Washington 2018, p. 24, https://openknowledge.worldbank.org/handle/10986/30317.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

produced the largest amount of waste in total at 468 million tons, with an average daily production of 0.56 kg per person. Of this, almost half (47 %) of all waste is produced in China. Nevertheless, the population of China, which accounts for two thirds of the entire region's population, produces less waste per capita per day than the regional average (0.43 kg). People living in rural areas generate very little waste.[297]

Nevertheless, China is generating an enormous amount of waste as a country, which results not only from growing production, but also from the spread of consumption patterns associated with increasing wealth. This trend is also influenced by demographic changes, the lifestyles of the Chinese population, and the country's economic development. This state of affairs, which presents a serious environmental problem, has finally brought to the fore the question of how to produce less waste and how to manage it. In November 2017, Zhang Dejiang, Chairman of the Standing Committee of the National People's Congress, reported that the total amount of industrial waste in China is 60–70 billion tons. China produces 4 billion tons of animal waste every year, about 1 billion tons of straw as a byproduct from harvesting, 3.3 billion tons of industrial waste, 40 million tons of hazardous industrial waste, 1.35 million tons of medical waste, and 1.8 billion tons of construction waste. Large and medium-sized cities generate 200 million tons of municipal waste every year. Zhang drew attention to the phenomenon of towns and villages "drowning in garbage" (垃圾围城, *laji weicheng*). He stressed that households are weakened by lack of waste segregation and low public awareness. In contrast to cities, where municipal waste collection and disposal systems are widespread, only 43 % of villages have a centralized system for collecting and transporting household waste.[298]

Although total imports of solid waste have decreased by an average of 46.5 % per annum,[299] China has remained the world's largest importer of waste over the last four decades. The government began importing waste intended for processing in the 1980s, when the national economy needed cheap raw materials. Secondary raw materials were cheaper than primary raw materials. They immediately became a critical source of raw material for the manufacturing industry, but also a source of pollution. Every year, domestic companies process 8 million tons of foreign waste, using it as a raw material for new products. As much as 87 % of plastic waste from Europe has ultimately made it to China, either

297 *Ibidem.*

298 Quanguo renmin daibiao dahui changwu weiyuanhui zhifa jiancha zu guanyu jiancha "Zhonghua renmin gongheguo guti feiwu wuran huanjing fangzhi fa" shishi qingkuang de baogao (全国人民代表大会常务委员会执法检查组关于检查《中华人民共和国固体废物污染环境防治法》实施情况的报告), Zhongguo renda xinwen (中国人大新闻), November 2, 2017, http://npc.people.com.cn/n1/2017/1102/c14576-29622406.html.

299 *Quanguo shengtai baohu gongzuo huiyi zaijing zhaokai*, op. cit.

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directly or through Hong Kong,[300] as has 56 % of plastic waste from around the world.[301] Imports of solid waste increased for many years, reaching a peak of 58.9 million tons in 2012. In 2017, these imports amounted to 43.7 million tons, but illegal imports certainly make the real figure much higher.[302] A total of 106 million tons of plastic waste were shipped to China between 1992 and 2016. Together with Hong Kong, China has imported 72.4 % of all plastic waste worldwide. It is worth mentioning that most of the waste imported into Hong Kong (63 %) was subsequently shipped to China. Research by Science Advances shows that the central government's actions will divert 111 million tons of plastic waste from being imported to China by 2030.[303]

In February 2013, China launched an eight-month campaign called Operation Green Fence[304] to enforce strict regulations on the quality of imported waste. The government announced that Chinese importers would not accept badly sorted or dirty waste from abroad for recycling. The campaign was to consist of random controls of imported waste such as metal, plastic, textiles, rubber, and paper. The campaign has affected the recycling industry, forcing the U.S. and other countries to apply higher standards in terms of what they export. The resulting decrease in plastics imports was compensated for by an increase in the volume of low-quality plastics produced by Chinese manufacturers. In 2016, another initiative was launched in the form of the National Sword 2017 campaign, which focused on reducing the amount of plastic and other materials reaching local plants without proper control. In July 2017, China presented a plan to reform its solid waste import management system, partly through a gradual reduction in the volume of imports,[305] with the aim of banning imports in four categories, accounting for

300 Costas Velis, *Global recycling markets: plastic waste. A story for one player – China*, A report from the ISWA Task Force on Globalisation and Waste Management, International Solid Waste Association, September 2014, p. 27, https://www.iswa.org/fileadmin/galleries/Task_Forces/TFGWM_Report_GRM_Plastic_China_LR.pdf.

301 *Ibidem*, p. 25.

302 *Jinling shishi yi nian: "Yang laji" jian jianshao "zaisheng ye" xu guifan* (禁令实施一年："洋垃圾"渐减少 "再生业"需规范), "Jingji Ribao" (经济日报), August 10, 2018, http://www.xinhuanet.com/finance/2018-08/10/c_1123251608.htm.

303 Amy L. Brooks / Wang Shunli / Jenna R. Jambeck, *The Chinese import ban and its impact on global plastic waste trade*, "Science Advances" 4(6) (2018), https://advances.sciencemag.org/content/4/6/eaat0131.

304 Jerry Powell, *Operation Green Fence Is Deeply Affecting Export Markets*, Resource Recycling, April 12, 2013, https://resource-recycling.com/recycling/2013/04/12/operationgreen-fence-is-deeply-affecting-export-markets/.

305 Guowuyuan bangongting guanyu yinfa jinzhi yang laji rujing tuijin guti feiwu jinkou guanli zhidu gaige shishi fang'an de tongzhi (guo ban [2017] 70 hao) (国务院办公厅关于印发禁止洋垃圾入境推进固体废物进口管理制度改革实施方案的通知 (国办 [2017] 70号)), Guowuyuan bangongting (国务院办公厅), July 18, 2017, http://www.gov.cn/zhengce/content/2017-07/27/content_5213738.htm.

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24 types of solid waste, by January 1, 2018[306]. The ban pertained to plastic waste, paper waste, cotton waste, textile waste, slag, ash, iron, and steel production waste, among others.

Table 12. Products affected by China's waste ban

Product category	No. of categories
Plastic waste from living sources	8
Vanadium slag	4
Unsorted paper waste	1
Textile waste	11

Source: own work based on: Guanyu fabu "jinkou feiwu guanli mulu" (2017 nian) de gonggao, gonggao 2017 nian di 39 hao (关于发布《进口废物管理目录》（2017年）的公告, 公告2017年第39号), Huanjing baohu bu (环境保护部), Shangwu bu (商务部), Fazhan gaige wei (发展改革委), Haiguan zongshu (海关总署), Zhijian zongju (质检总局), August 10, 2017, http://www.mee.gov.cn/gkml/hbb/bgg/201708/t20170817_419811.htm

Shortly afterwards, in April 2018, the Ministry of Ecology and Environment announced that a ban on the import of 16 types of waste to China would come into force at the end of 2019, including scrapped ships, compressed cars, electric cables, and chemical parts. Sixteen additional categories would be subject to an import ban, including wood waste and stainless steel, titanium, zinc, and magnesium scrap metal.[307] Ministry spokesperson Liu Youbin argued that the reduction of solid waste imports was the result of the government's implementation of a new development concept to improve the quality of the ecological environment and protect both the ecological security of the country and human health.[308] At the same time, in addition to the solutions adopted to reduce the import of waste, China began to segregate and recycle waste domestically on a large scale. This was dictated by the need to protect the environment, save energy and raw materials, and generate less waste. In June 2019, while speaking about the

306 Guanyu fabu "jinkou feiwu guanli mulu" (2017 nian) de gonggao, gonggao 2017 nian di 39 hao (关于发布《进口废物管理目录》（2017年）的公告, 公告2017年第39号), Huanjing baohu bu (环境保护部), Shangwu bu (商务部), Fazhan gaige wei (发展改革委), Haiguan zongshu (海关总署), Zhijian zongju (质检总局), August 10, 2017, http://www.mee.gov.cn/gkml/hbb/bgg/201708/t20170817_419811.htm.

307 Guanyu tiaozheng "jinkou feiwu guanli mulu" de gonggao, gonggao 2018 nian di 6 hao (关于调整《进口废物管理目录》的公告, 公告2018年第6号), Shengtai huanjing bu (生态环境部), Shangwu bu (商务部), Guojia fazhan he gaige weiyuanhui (国家发展和改革委员会), Haiguan zongshu (海关总署), April 13, 2018, http://www.mee.gov.cn/gkml/sthjbgw/sthjbgg/201804/t20180419_434911.htm.

308 *You you 32 zhong guti feiwu jiang bei jinzhi jinkou* (又有32种固体废物将被禁止进口), Xinhua (新华), Zhongyang zhengfu menhu wangzhan (中央政府门户网站), April 19, 2018, http://www.gov.cn/xinwen/2018-04/19/content_5284087.htm.

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need to cultivate the habit of sorting waste, PRC President Xi Jinping stressed the need for social education in this regard.[309]

It is therefore very telling that the highest recycling rates in 2014 were recorded in Europe (30 %) and China (25 %, with a goal of least 35 % by the end of 2020), while in the United States, plastics recycling has remained stable at 9 % since 2012. Between 1950 and 2015, around 6.3 billion tons of plastic waste were generated worldwide, of which only 9 % (600 million tons) were recycled and 12 % (800 million tons) were incinerated. The rest (about 4.9 billion tons, or 60 %) is collected in landfills or accumulate in the environment.[310] For 2019, China earmarked 21.3 billion RMB (about 3 billion USD) for planned investments in waste sorting and set out to integrate 46 pilot cities into its waste sorting system, in line with waste sorting program promoted by the Ministry of Housing and Urban-Rural Development.[311] Before 2035, these cities are supposed to establish a comprehensive classification system for domestic waste at a high international standard.[312]

Waste sorting requires changing existing habits and developing new habits. Environmental awareness and knowledge of how to segregate waste is essential. However, the Chinese have a big problem with this, as evidenced by the results of a survey conducted on a group of 13,086 respondents from all over China by the Policy Research Center for Environment and Economy (生态环境部环境与经济政策研究中心) at the Ministry of Ecology and Environment. Their report on citizens' environmental behavior (公民生态环境行为调查报告, 2019) shows that 92.2 % of respondents appreciate the importance of sorting waste for environmental protection, but only 30.1 % responded that they feel they are

309 *Xi Jinping: peiyang laji fenlei de hao xiguan wei gaishan shenghuo huanjing zuo nuli wei lüse fazhan ke chixu fazhan zuo gongxian* (习近平：培养垃圾分类的好习惯为改善生活环境作努力为绿色发展可持续发展作贡献), Xinhua (新华), Zhongyang zhengfu menhu wangzhan (中央政府门户网站), June 3, 2019, http://www.gov.cn/xinwen/2019-06/03/content_5397086.htm.

310 Roland Geyer / Jenna R. Jambeck / Kara Lavender Law, *Production, Use, and Fate of all Plastics Ever Made*, "Science Advances" 3(7) (2017), https://advances.sciencemag.org/content/3/7/e1700782?ijkey=8a4d9e091515bf3d2427ce25c9f06afe0793f5f7&keytype2=tf_ipsecsha.

311 This includes Beijing, Tianjin, Shanghai, Chongqing, Shijiazhuang, Handan, Taiyuan, Hohhot, Shenyang, Dalian, Changchun, Harbin, Nanjing, Suzhou, Hangzhou, Ningbo, Hefei, Tongling, Fuzhou, Xiamen, Nanchang, Yichun, Zhengzhou, Jinan, Taian, Qingdao, Wuhan, Yichang, Changsha, Guangzhou, Shenzhen, Nanning, Haikou, Chengdu, Guangyuan, Deyang, Guiyang, Kunming, Lhasa, Shigatse, Xi'an, Xianyang, Lanzhou, Xining, Yinchuan, and Urumqi.

312 Zhufang chengxiang jianshe bu guanyu jiakuai tuijin bufen zhongdian chengshi shenghuo laji fenlei gongzuo de tongzhi (jiancheng [2017] 253 hao) (住房城乡建设部关于加快推进部分重点城市生活垃圾分类工作的通知 (建城 [2017] 253号), Zhonghua renmin gongheguo zhufang he chengxiang jianshe bu (中华人民共和国住房和城乡建设部), December 20, 2017, http://www.mohurd.gov.cn/wjfb/201801/t20180103_234625.html.

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managing it correctly. This means that nearly 70 % of the respondents are not equipped to deal with this problem. Respondents explained that there are no containers for sorting trash in their homes (63.7 %) or that the garbage is not sorted during transport, so there is no need to sort it at home (59.6 %). Some replied that they did not know how to classify individual waste (36.5 %) and some did not see the need for sorting at all (34.5 %).[313]

In most cities that are part of the pilot program, waste will be sorted into four categories: hazardous waste, kitchen waste, recyclable items, and other waste.[314] To make it easier for the public to understand what is covered by the different categories, some cities have adopted different names and signs. For example, Shanghai distinguishes between dry and wet garbage, while in Beijing there is kitchen waste and other waste. Furthermore, artificial intelligence-based tools and applications will assist with sorting in China. Shanghai introduced its own waste disposal regulations on July 1, 2019. Those who did not comply with the new rules faced high penalties and a possible drop in their social credit score. Tencent, one of China's technology giants, is assisting such potential 'culprits' through a mini-program called *Master of Trash Sorting*, which is geared toward the population of Beijing, Shanghai, Shenzhen, and Guangzhou. The program instructs users how waste should be sorted and disposed of based on keywords.

Similarly, Alipay has used artificial intelligence in a waste sorting program in Shanghai and other Chinese cities. Alipay's application indexes more than 4,000 different types of waste, which allows residents to get information about categories of waste on their smartphones. JD.com, an e-commerce site, provides image recognition technologies supported by artificial intelligence, making it easier for companies to sort trash.[315] The use of modern technologies in waste segregation was also proposed by designers from the Beijing Institute of Precision Mechatronics and Controls, who presented a waste sorting robot during the World Robot Conference in Beijing in August 2019. The machine recognizes recyclable objects with 94 % accuracy, from wooden waste to cans and plastic bottles, based on their shape and color. The robot places recyclable items in different containers, depending on the type. However, the large size of the robot

313 *"Laji fenlei" jianxing du pubian di! Diaocha baogao: 70 % shoufang zhe zuo de cha zhuyin: "Xiaoqu ww fenlei laji tong"* ("垃圾分类"践行度普遍低！调查报告：70 %受访者做得差主因："小区无分类垃圾桶"), Jingji guancha wang (经济观察网), May 31, 2019, http://www.eeo.com.cn/2019/0531/357579.shtml.

314 *46 ge zhongdian chengshi jiasu tuijin laji fenlei, fenlei banfa ruhe yindizhiyi* (46个重点城市加速推进垃圾分类，分类办法如何因地制宜？), Zhongguo zhi sheng (中国之声), July 7, 2019, http://www.xinhuanet.com/local/2019-07/07/c_1124719389.htm.

315 Celia Chen, *China's war on trash goes hi-tech with AI-driven apps for sorting and facial recognition to enforce recycling*, "South China Morning Post", July 18, 2019, https://www.scmp.com/tech/policy/article/3018992/chinas-war-trash-goes-hi-tech-ai-driven-apps-sorting-and-facial.

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makes it difficult to use it in households at this stage. However, work on a 'home' version is already underway, and it is supposed to feature greater precision in identifying types of waste.[316]

Beijing's municipal authorities chose a different route. The Xicheng district uses intelligent technologies such as facial recognition and QR code scanning for waste sorting. A camera on each trashcan automatically recognizes the face of the resident and opens it. Residents use their mobile phones to scan the QR code on the machine and receive free garbage bags.[317] Intelligent devices have also been installed in other districts of the capital, including Dongcheng and Chaoyang. In the Minhang district of Shanghai, on the other hand, 100,000 sets of trash cards were issued. This solution was intended to help the local community understand how to sort waste.[318] China is also implementing educational programs on waste segregation for educational institutions. One example of such activities is the city of Changchun, where municipal authorities and the local education office have jointly developed a three-year program for primary and lower secondary schools to disseminate knowledge on the subject.[319] Similarly, the city of Hangzhou has incorporated garbage classification content into local primary and secondary school textbooks.[320]

The 'no-waste cities' project in China, which aims to minimize solid waste production and maximize recycling, can certainly be considered ambitious. According to the plan, 10 cities were selected for the pilot program, but this number will increase in 2021. By 2020, the pilot cities are expected to make significant progress, paired with nearly no increase in industrial waste storage and full use of agricultural waste. The plan envisaged the establishment of a coherent national statistical system on solid waste. It has been announced that Beijing–Tianjin– Hebei, the Yangtze River Economic Belt, and Greater Bay Area (or the Guangdong–Hong Kong–Macao Greater Bay Area) were the first to be

316 Zhao Lei, *New robot can lend a hand in effort to sort waste*, "China Daily", August 26, 2019, http://www.chinadaily.com.cn/a/201908/26/WS5d632d44a310cf3e35567c7b.html.

317 *Beijing yi xiaoqu laji fenlei yong shang ren lian shibie leiji jifen ke duijiang* (北京一小区垃圾分类用上人脸识别累计积分可兑奖), "Beijing qingnian bao" (北京青年报), July 22, 2019, http://news.china.com.cn/2019-07/12/content_74978860.htm.

318 *10 wan tao laji fenlei puke pai toufang minxing* (10万套垃圾分类扑克牌投放闵行), "Xinmin wanbao" (新民晚报), April 29, 2019, hinhttps://baijiahao.baidu.com/s?id=1632131448783690780&wfr=spider&for=pc.

319 *Changchun tuiguang laji fenlei bianzhi jiaocai "jin ketang" Xinhua she* (长春推广垃圾分类编制教材"进课堂" 新华社), Xinhua (新华), Zhongyang zhengfu menhu wangzhan (中央政府门户网站), May 18, 2019, http://www.gov.cn/xinwen/2019-05/18/content_5392771.htm.

320 *Hangzhou jiaoyu xitong quanmian shixing shenghuo laji fenlei* (杭州教育系统全面实行生活垃圾分类), Hangzhou wang (杭州网), September 22, 2018, http://hznews.hangzhou.com.cn/kejiao/content/2018-09/22/content_7072008.htm.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

considered in the process of selecting pilot cities.[321] These ten pilot 'no-waste cities' will control their increases in solid industrial waste and use of agricultural waste, coupled with a full ban on illegal waste disposal.

Since the pilot plan was published, provinces have been able to recommend cities for the 'no-waste cities' program. Ultimately, 11 cities and 5 areas (11+5) were selected. The selected cities include Shenzhen, Baotou, Tongling, Weihai, Chongqing, Shaoxing, Sanya, Xuchang, Xuzhou, Panjin, and Xining. The selected areas include Xiong'an New Area (a new economic zone near Beijing in Hebei Province in northern China), the Beijing Economic Technological Development Area, Zhongxin Tianjin Ecological City, Guangze County in Fujian Province, and the city of Rujin in Jiangxi Province.[322] As it turns out, waste sorting and recycling are becoming high-tech industries. It is estimated that by 2030 alone, the market value associated with the classification and recycling of solid waste in China will amount to 7–8 trillion RMB (about 1–1.1 trillion RMB), creating between 40 and 50 million jobs.[323] It can therefore be assumed that the development of indigenous technologies may increase the export of environmental products and services abroad, especially to countries covered by the New Silk Road Initiative.

In this context, it is worth noting that although the construction of 'no-waste cities' was first proposed in China, other developed economies in Europe, Japan, and Singapore have launched similar initiatives. Anchoring its initiatives in the promotion of green solutions, Japan started to implement a circular economic and social plan as early as the 1990s. Today, the focus there is on recycling and consumption of natural resources through increased resource efficiency as well as recycling in production lines, logistics, consumption, and waste management. Europe and Singapore have presented their own plans to reduce food and raw material waste, promoting the idea of a circular economy, recycling, and zero-waste solutions.[324]

China is also making efforts to demonstrate greater concern for the environment at the international level. One example of this is the signing of the

321 Guowuyuan bangongting guanyu yinfa "wu fei chengshi" jianshe shidian gongzuo fang'an de tongzhi (guo ban fa [2018] 128 hao) (国务院办公厅关于印发"无废城市"建设试点工作方案的通知 (国办发 [2018] 128号)), Guowuyuan bangongting (国务院办公厅), December 29, 2018, http://www.gov.cn/zhengce/content/2019-01/21/content_5359620.htm.

322 Guanyu yinfa "wu fei chengshi" jianshe shidian shishi fang'an bianzhi zhinan" he "wu fei chengshi" jianshe zhibiao tixi (shixing)" de han (关于印发《"无废城市"建设试点实施方案编制指南》和《"无废城市"建设指标体系（试行）》的函), Shengtai huanjing bu bangongting (生态环境部办公厅), May 8, 2019, http://www.mee.gov.cn/xxgk2018/xxgk/xxgk06/201905/t20190513_702598.html.

323 *Laodong wan yi chanzhi 11 ge "wu fei chengshi" shidian luo ding* (拉动万亿产值11个"无废城市"试点落定), "Beijing shang bao" (北京商报), April 29, 2019, http://www.bbtnews.com.cn/2019/0429/298609.shtml.

324 *"Wu fei chengshi" lantu gouxiang* ("无废城市"蓝图构想), "Zhongguo huanjing bao" (中国环境报), January 30, 2019, http://env.people.com.cn/n1/2019/0130/c1010-30600170.html.

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Memorandum of Understanding on Circular Economy Cooperation by China and the European Union on July 16, 2018 in Beijing.[325] In early April 2018, China hosted an EU delegation led by Karmenu Vella, European Commissioner for the Environment, Maritime Affairs, and Fisheries. He co-chaired the 7th Environmental Policy Dialogue, which initiated new areas of high-level dialogue on water and circular management. China is one of the participants in a EUR 9 million EU project to reduce plastic and marine waste in East and South-East Asia, launched on May 1, 2019. These steps aim to strengthen EU cooperation with selected countries on sustainable consumption and production of plastics, and to support the transition to a circular economy in line with the Action Plan adopted by the EU.[326]

There is no doubt that waste poses a major environmental challenge and that disposing of it in landfills releases toxic gases and particles into the atmosphere. Waste has an equally harmful impact on surface water, ground water, and soil. A circular economy, based on waste reduction and recycling, focuses on extending the life cycle of individual products. China has taken steps to implement this circular economic model, but it is important to remember that this is only the first step. In view of the scarcity of raw materials, the need to improve energy efficiency while reducing consumption of natural resources and energy becomes particularly important. The goal of plastic recycling programs and the promotion of alternative materials should be to reduce the use of fossil fuels – and thus, CO_2 emissions.

Since China entered the path of reform and opening-up to the world in the late 1970s, the country has focused on achieving high rates of economic growth through increased industrial production and exports. The inflow of direct investments from abroad and wide access to cheap fossil fuels was conducive to this goal. This initial stage of the transformation was not accompanied by reflection on sustainable development, but rather only on sustaining the upward trend. However, it appears that the GDP growth rate does not solely reflect economic development; as such, it is not sufficient to assess society's wealth. High GDP growth is not equivalent to ensuring widespread access to general goods, education, health care, and social services, nor does it take into account changes in people's leisure time, the valuation of social capital, the state of the environment, or the political and cultural aspects of development. Finally, we must not forget

325 *Memorandum of Understanding on Circular Economy Cooperation*, European Commission, July 16, 2018, https://ec.europa.eu/environment/circular-economy/pdf/circular_economy_MoU_EN.pdf.

326 *EU and China step up their cooperation on environment, water and circular economy*, European Commission, April 1, 2019, https://ec.europa.eu/info/news/eu-and-china-step-their-cooperation-environment-water-and-circular-economy-2019-apr-01_en.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

that during a period of such vigorously promoted economic growth, social inequalities tend to grow, which is one of the triggers of social conflict.

In addition, increases in production that are achieved in unsustainable ways are accompanied by increased consumption of resources and pollution of the environment, which in turn lowers quality of life. Economic growth in China has also exacerbated the already significant differences in living standards between regions and between urban and rural areas. This indirectly shows that the central authorities have long lived with the conviction that GDP growth is the most important factor, with much less importance assigned to how this income is distributed among various social groups. It is also indisputable that China has experienced growth with little consideration for the social costs and negative environmental impact of production. Instead, the focus was on the multiplication of wealth and the responsible use of resources for future generations.

The situation only began to change at the beginning of the 21st century, when China began to reorient its domestic policy towards building an ecological civilization. While this was initially seen as a political commitment to reform the existing development model and make it more 'people-centered,' it is now expected to be more comprehensive, coordinated, and sustainable. At the same time, adopting the concept of the ecological civilization signifies a departure from the rhetoric to date, according to which international environmental standards were perceived as a vector of hidden Western imperialism. China's continuous references to traditional Chinese cultural values as underlying the notion of environmental protection, derived from the writings of ancient philosophical schools, is supposed to show the world and national opinion that international pressure is not needed (or justified) for China to take action. At the same time, it shows that the government's use of cultural references is selective and adapted to prevailing needs at any given time – no doubt the result of a pragmatic approach on the part of the CPC to the environmental issues at hand.

Until the late Middle Ages, China surpassed the West in the use of natural knowledge for practical purposes. However, the role of practical knowledge was emphasized without extensive theoretical deliberations to back it up. Thus, China fell behind in developing new cognitive and theoretical directions. While Confucianism was emphasizing practical application, European rationalism sought the theoretical key to later inventions and innovations that ultimately revolutionized our perception of the world. For this reason, the formulation of an original theoretical proposal for sustainable development – one that would highlight a form of ecological action attuned to the needs of China and in opposition to the environmental theories presented in the West – remains a major challenge for China today. Still, the pragmatism of the contemporary Chinese rulers is evidenced by the lack of such appeals in official political discourse since the start of the economic crisis of 2008. Party management perceives the envi-

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ronmental crisis mainly through the lens of possible political, social, and economic threats. Thus, China officially reiterated its position on green growth and expressed support for the concept of a low carbon economy at the Asia-Pacific Economic Cooperation Summit, committing itself to reducing its carbon emissions by 40–45 % at the 2009 Copenhagen Climate Change Conference.

Unlike its predecessors, the current generation of leaders, spearheaded by Xi Jinping, does not interpret environmental issues primarily as hazards or risks, but rather focus on building a positive narrative around ecology, incorporating it as a key element of the Chinese Dream (中国梦, *Zhongguo meng*) and the idea of the "Great Rejuvenation of the Chinese Nation" (中华民族伟大复兴, *Zhonghua minzu weida fuxing*). This vision is more in line with the Western approach, which posits the reduction of negative environmental impacts of economic activities as a result of transformations in consumer demand patterns and technological progress. In this context, modern-day ecology is seen as an integral part of ongoing structural reforms, essential for achieving more sustainable economic growth. This objective is achieved through measures to increase efficiency in the use of natural resources, reduce waste, and rationally reduce energy consumption. China's official message goes even further, suggesting that the ecological civilization is a higher stage of development than the agrarian and industrial civilizations. This slogan is accompanied by a shared belief in the possibility of revolutionizing the global economic order according to China's own rules and spearheading a global ecological transformation.

President Xi Jinping's rhetoric on fighting pollution and the building of an ecological civilization focuses primarily on the need to consolidate the power of the Communist Party of China. Part of this assumption of primacy is that further ecological transformation is conditioned by the strong position of China's rulers. This approach proves that a positive narrative about the ecological civilization is an inherent element of the CPC's propaganda. Intentionally formulated references to the ecological civilization in the future tense convey to the population that ecological progress depends solely on the will and determination of those in power. In fact, the very concept of an ecological civilization is unclear, which gives the Party a lot of freedom to interpret it. The model of environmental management proposed by the Chinese authorities does not fully combine theory with practice. The emphasis placed on the importance of the ecological civilization in the Chinese approach to development policy is primarily intended to strengthen the government's doctrinal messaging to its own society.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

Chapter 4. Renewable energy as a support mechanism for sustainable development in China

The great potential of renewable energy sources (RES) stems not only from their virtually unlimited availability, but also from their positive environmental impact. They are becoming an important ingredient for harmonious economic and natural development. This is because they reduce greenhouse gas emissions, diversify the energy supply, and reduce dependence on fossil fuel markets – primarily coal, oil, and natural gas. They are also important for the future of the transport sector considering the dynamic development of electric vehicles and electromobility worldwide. The latter will in turn affect the oil and gas market, which must take into account the potential of new energy sources in its development plans.

However, the development of the renewable energy sector continues to face a number of constraints that render it less competitive vis-à-vis traditional energy sources. Nonetheless, dynamic progress in the development of new technologies, combined with the falling costs of generating energy from alternative sources, will ultimately transform the energy mix and gradually replace fossil fuels with renewable and clean energy sources. In the long term, we can assume that the future of energy will be built on a foundation laid by alternative energy sources. Technological progress in the field of renewable energy, together with increasingly competitive prices, will stimulate the development of smart grid management. The smart grid dynamically integrates all of the parties engaged in the energy market in the processes of generation, transmission, distribution, and use of energy, providing electricity in a continuous, efficient, and affordable manner. The implementation of such solutions will increase energy security and aid in optimizing the energy supply on a national level. Finally, one cannot ignore that the development of renewable energy sources will further stimulate employment by creating new jobs in the green technology sector.

Although China has followed a path of rapid economic growth over the last four decades, its development policy has scarcely considered the environmental consequences of increased air pollution and climate change. However, the risks involved have forced the central authorities in Beijing to change their focus and

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start trying to implement ambitious programs to develop renewable energy and improve energy efficiency. On the one hand, this change was motivated by the need to improve energy security and increase the competitiveness of the economy; on the other, it was driven by the desire to reduce the existing pressure on the environment and mitigate the effects of climate change.

1. Statutory solutions for the development of renewable resources

China's regulations governing alternative energy sources have long been scattered, heterogeneous, and fragmented. Although legislative solutions from the 1980s contained references to renewable energy, they narrowed the issue down to rural development and approached each case in isolation, i. e. without creating an energy transmission system between them. On December 28, 1995, the Parliament adopted the Electric Power Law (中华人民共和国电力法), which came into force on April 1, 1996.[327] Its main stipulation was the safe development of the electricity generation industry (Article 1). The government emphasized the need to accelerate the electrification process in rural areas by leveraging the development of hydroelectric power and constructing of small and medium-sized hydroelectric plants. It also stressed the role of expanded use of solar, wind, geothermal, biomass, and other alternative energy sources (Article 48).

On November 1, 1997, the National People's Congress passed the Law on Conserving Energy (中华人民共和国节约能源法), which came into force on January 1, 1998.[328] The law emphasized energy conservation, improving energy efficiency, and the need to protect the environment (Article 1). The legislative body introduced legal instruments to create a system of incentives for the development and use of new and renewable energy sources (Article 4). Energy conservation was henceforth included in national plans for economic and social development to ensure rational energy consumption and coordination with economic development and environmental protection (Article 5). The law stipulated that funding mechanisms would be created at the central and local level to finance tasks related to energy conservation and the promotion of new and renewable energy sources (Article 11). At the same time, the law laid the groundwork for the development of alternative energy sources in the country-

327 Zhonghua renmin gongheguo dianli fa (中华人民共和国电力法), Zhongguo renda wang (中国人大网), December 28, 1995, http://www.npc.gov.cn/wxzl/gongbao/2000-12/05/content_5004652.htm.

328 Zhonghua remin gongheguo jieyue nengyuan fa (中华人民共和国节约能源法), Quanguo renda fagui ku (全国人大法规库), Zhongguo zhengfu menhu wangzhan (中国政府门户网站, November 1, 1997, http://www.gov.cn/banshi/2005-08/31/content_68768.htm.

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side, i. e. biogas, solar energy, wind energy, hydroelectric energy, and geothermal energy (Article 38).

The Law on Conserving Energy was clarified with an amendment on October 28, 2007.[329] This new law has been in force since April 1, 2008, and establishes the principle that conserving resources is the foundation for China's national policy (Article 4). It introduced a system of accountability for achieving the objectives of the country's energy conservation policy and for evaluating local governments in this respect (Article 6). Additionally, it defines institutions that may provide state support for an industrial policy based on conserving energy, protecting the environment, limiting the role of high-pollution industrial sectors with significant energy consumption, and developing energy-efficient and environmentally friendly industries. According to the law's provisions, the State shall promote the development and use of new and renewable energy sources (Article 7). The law encourages the use of energy-efficient building materials and equipment as well as the installation of systems that rely on renewable energy, such as solar power (Article 40). The solutions adopted in this law are crafted so as to interact with the development of new technologies in the field of energy conservation – including, in particular, the construction of new agricultural biogas plants, the dissemination of technologies for the use of renewable energy in the countryside (biomass, solar, wind, and hydroelectric power), and investments in the development of energy-efficient rural construction (Article 59).

These amendments entailed changes in the existing system of accountability applied to local authorities. The measures adopted mean that the assessment of their results takes into account their implementation of guidelines for reducing energy use set at the national, central level (on top of the objectives set at the local level). The amendments stipulate that a system be put in place for calculating energy consumption per unit of GDP, which is intended to help increase the responsibility and accountability of authorities and businesses at local level. Thus, a monitoring system was put in place to estimate energy consumption per unit of GDP and aggregate the results to form a comprehensive national image of energy consumption and energy efficiency. This is complemented by statistical analysis to monitor emissions of key pollutants such as sulfur dioxide and carbon dioxide. The amendment also led the authorities to further emphasize the issue of raising public awareness about economical energy consumption.

329 Zhonghua remin gongheguo zhuxi ling (di 77 hao) (中华人民共和国主席令 (第七十七号), Xinhua (新华), Zhongyang zhengfu menhu wangzhan (中央政府门户网站), October 28, 2007, http://www.gov.cn/flfg/2007-10/28/content_788493.htm.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

On September 5, 1987 the National People's Congress passed the Air Pollution Prevention and Control Law (中华人民共和国大气污染防治法).[330] The first amendment to this law was passed on April 29, 2000 and entered into force on September 1, 2000. In it, the NPC highlighted the role of renewable energy in reducing the effects of air pollution. The law indicates explicitly that the State will support scientific and technological research on preventing and controlling air pollution, promote the development of advanced technologies to achieve this objective, and support the development and use of clean energy such as solar, wind, and hydroelectric power (Article 9). According to the amendment, companies should prioritize introducing clean production processes with high energy efficiency and low emissions (Article 19). The relevant ministries at the central level committed to taking action to improve the energy mix of cities and the use of clean energy in production processes. The amendments underline not only the need to reduce the use of highly polluting fuels and to switch to natural gas, electricity, or other clean energy sources (Article 25), but also introduce instruments to encourage the use of clean energy in the transportation industry (Article 34).

The second amendment to the aforementioned Air Pollution Prevention and Control Law was passed on August 29, 2015 and entered into force on January 1, 2016.[331] The solutions adopted therein emphasized environmental protection, prevention and control of air pollution, protection of public health, building an ecological civilization, and sustainable economic and social development (Article 1). The amendment then turns its focus on addressing the need to introduce changes in the national energy structure in order to popularize the use of clean energy, optimize the usage and consumption of coal, gradually reduce the role of coal in energy production (Article 32), and promote clean coal technologies (Articles 33, 34). Another notable rule introduced on this occasion was to give priority to clean energy sources when adding energy to the grid (Article 42).

A government-issued strategy paper titled "Environmental Protection in China (1996–2005)" (中国的环境保护1996–2005), published in June 2006, contains further observations on the development of renewable energy sources.[332] The document can be viewed as an official strategy statement, as it provides

330 Zhonghua remin gongheguo daqi wuran fangzhi fa (xiuding) (中华人民共和国大气污染防治法（修订）), Zhongguo renda wang (中国人大网), September 5, 1987, http://www.npc.gov.cn/wxzl/wxzl/2000-12/07/content_9501.htm.

331 Zhonghua remin gongheguo daqi wuran fangzhi fa (zhuxi ling di 31 hao) ((中华人民共和国大气污染防治法（主席令第三十一号）, Xinhua (新华), Zhongyang zhengfu menhu wangzhan (中央政府门户网站), August 29, 2015, http://www.gov.cn/zhengce/2015-08/30/content_2922326.htm.

332 Zhongguo de huanjing baohu (1996–2005) (中国的环境保护（1996－2005）), Xinhua (新华), Zhongyang zhengfu menhu wangzhan (中央政府门户网站), June 2006, http://www.gov.cn/zwgk/2006-06/05/content_300288.htm.

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guidelines for achieving specific goals within the specified period. It is does not constitute universally binding law but expresses the government's position on the issue. The paper set out a framework within which – or on the basis of which – new legal solutions should be designed. For instance, it points to projects that envision creating and crystallizing new energy sources in rural areas as priority initiatives given their importance in the context of improving the ecological environment. The document notes that, in the course of the 10th Five-Year Plan (2001–2005), a total of 3.5 billion RMB (approximately 490 million USD) were spent from the central budget on activities related to the promotion of the ecological energy model, mainly aimed at developing China's biogas capacity. At the same time, it yet again underscores the need to use renewable energy sources, particularly solar, wind, and geothermal.

However, the key development that triggered a paradigm change in China's approach to renewable energy sources was the Renewable Energy Law (中华人民共和国可再生能源法), passed on February 28, 2005 and in force since January 1, 2006.[333] The core tenets of this law were to expand the development and use of renewable energy, increase energy supply, improve the country's energy structure, ensure energy security, protect the environment, and implement sustainable economic and social development (Article 1). The law also defined the term 'renewable energy' as referring to non-fossil energy sources, i.e. wind, solar, hydroelectric, biomass, geothermal, and ocean energy (Article 2). It identified the development and use of renewable energy as a key area for the future of the broader energy sector and highlighted the importance of developing the renewable energy market itself (Article 4). The law also stipulated that research related to renewable energy was to be included in China's national science and technology development plan as well as its high-tech industries development plan. Another provision allowed for the creation of funding mechanisms to support the renewable energy sector (Article 12). The law introduced preferential and guaranteed access to the power grid. Energy grid operators were obliged to take in and use all energy derived from renewable sources. In this context, a system of feed-in tariffs was introduced to enhance the competitiveness of renewable energy sources in relation to their traditional counterparts (Article 14). Finally, the law reiterated need to use renewable energy in rural areas (Article 18).

It should be noted that, since the Renewable Energy Law entered into force, renewable energy sector has developed at a very rapid pace – primarily wind and solar energy. However, several systemic problems quickly became apparent, signaling the need to improve coordination between the national energy strategy

333 Zhonghua remin gongheguo kezaisheng nengyuan fa (中华人民共和国可再生能源法), Zhongyang zhengfu menhu wangzhan (中央政府门户网站), February 28, 2005, http://www.gov.cn/ziliao/flfg/2005-06/21/content_8275.htm.

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and the rapidly growing renewable energy sector. As the government was drawing up its national renewable energy plans, it failed to truly assess the potential of the sector and the technical constraints and local conditions that often have a significant impact on its development. Critics pointed out that the construction of new installations had not kept pace with the rapid growth of production capacity from renewable energy sources. The regions with the greatest wind potential in northern China (such as Inner Mongolia, Gansu, and Xinjiang) are geographically far removed from the main hotspots of demand in the east of the country. Connecting these areas requires ample time to create the appropriate infrastructure. These problems were reflected in the fact that one third of the total installed wind power capacity was not connected to the grid during this period.

Another problem was the lack of access of renewable energy generation devices and networks to the power grid. One of the most important provisions of the Renewable Energy Act was a clause mandating that all electricity generated with the use of renewable energy sources must be purchased. If the transmission system operators did not fully purchase energy from renewable sources, the relevant energy regulators would recommend corrections within a prescribed deadline. If an operator refused to implement those changes, the authorities were entitled to impose a fine. However, operators were not able to meet these requirements, given that the development of the renewable energy sector was not aligned with the equally rapid development of energy grid operators. As a result, they often did not have real opportunities to use the significant amount of energy generated by renewable sources. Statutory obligations were bypassed on the grounds that following them would entail technical problems, trigger possible disruptions to the energy supply, or negatively affect the country's energy security.

These challenges were addressed by an amendment to the Renewable Energy Law, dated December 26, 2009.[334] The resulting changes, which came into force on April 1, 2010, focused on the modernization of power grids, improvement of their technical capacity, operational management, and the development of smart grids and energy storage techniques (Article 14). State Electricity Regulatory Commission and the public finance department of the State Council were to periodically reevaluate the relationship between the amount of energy produced from renewable sources and total electricity production (Article 14). The amendment compels the government to take into account the specific conditions that characterize particular regions in each planned renewable energy project

334 Quanguo renmin daibiao dahui changwu weiyuanhui guanyu xiugai "Zhonghua renmin gongheguo kezaisheng nengyuan fa" de jueding (全国人民代表大会常务委员会关于修改《中华人民共和国可再生能源法》的决定), Zhongyang zhengfu menhu wangzhan (中央政府门户网站), December 26, 2009, http://www.gov.cn/flfg/2009-12/26/content_1497462.htm.

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(Article 9). It also enhanced coordination among the relevant departments, both at the central and local level. Local authorities would henceforth be required to draw up local renewable energy development plans based on the national renewable energy development strategy, while provincial authorities would be required to regularly inform the central authorities of all planned renewable energy activities (Article 8). Finally, it established the Renewable Energy Development Fund (可再生能源发展基金), to be managed by the Ministry of Finance. Since the cost of connecting renewable energy sources to the grid continued to be significantly higher than that of conventional sources of energy production, the fund was to support the development of renewable energy projects, including scientific and technological research, the implementation of clean energy projects in rural areas, the construction of independent renewable energy supply systems in remote areas, the construction of information systems dedicated to renewable energy, and the development of equipment for renewable energy sources (Article 24).

The Renewable Energy Law set out the legal framework for the development of renewable energy in China and, at the same time, announced the creation of financial incentives and tax breaks to stimulate the development of the renewable energy sector. For instance, in the solar energy sector, the central government presented the conditions to receive financial support for the installation of BIPV (building integrated photovoltaics) in March and July 2009. It also implemented a pilot project called the Golden Sun Programme, which introduced subsidies for investments in photovoltaic projects and related transmission and distribution systems.[335] In tandem with this, a system of subsidies for electricity produced from wind has been in place since 2008, mainly based on feed-in tariffs. Thanks to these measures, China achieved a significant increase in wind power capacity in a short time span.

In June 2007, the National Development and Reform Commission presented China's National Climate Change Program (中国应对气候变化国家方案). This strategy document was the first to set a target to increase the share of renewable energy in total energy consumption (to 10 % in 2010) and energy consumption per unit of GDP (by 20 % by 2010 compared to 2005). The program also prioritizes the development of renewable energy sources, nuclear energy, and coalbed methane (CBM).[336] In another strategy paper, titled "The Medium and Long-term Development Plan for Renewable Energy" (可再生能源中长期发展规划) and published two months later, the National Development and Reform

335 Doris Fischer, *Green industrial policies in China – The example of solar energy* [in:] Anna Pegels (ed.), *Green industrial policies in emerging countries*, Routledge, New York 2014, p. 82–83.

336 *Zhongguo yingdui qihou bianhua guojia fang'an zhaiyao* (中国应对气候变化国家方案摘要), "Renmin Ribao" (人民日报), June 5, 2007.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

Commission upheld its 2010 commitment to achieve a 10 % share of renewable energy in total energy consumption. However, this paper introduced a new component by setting a long-term goal of increasing this ceiling to 15 % in 2020. Targets were also set for increasing China's total operating renewable energy capacity. Wind energy production was expected to increase to 5GW in 2010 and 30GW in 2020; solar to 300MW and 1.8GW; hydro to 190GW and 300GW; and biomass to 5.5GW and 30GW, respectively.[337]

Promoting renewable energy sources and increasing their share in the national energy balance are also key themes of an October 2012 white paper titled "China's Energy Policy 2012" (中国的能源政策（2012）白皮书). Chapter 4 of this document (大力发展新能源和可再生能源) stresses the importance of developing new and renewable energy sources in the context of supporting emerging strategic economic sectors, protecting the green environment, coping with climate change, and achieving sustainable development. It placed emphasis on the active development of hydroelectric power, which is crucial in the context of the objectives set for 2020. Next, the white paper singles out the development of nuclear power – perceived as a clean, efficient, and modern source of energy – as having great importance for optimizing the energy structure and ensuring the energy security of the country. However, it also pointed out that the nuclear sector accounted for only 1.8 % of total electricity production at the time of its publication, while the world average was 14 %.[338]

The white paper also stressed the importance of the efficient development of wind energy based on the potential of resources in northwestern, northern, and northeastern China as well as available and exploitable marine resources. The authors noted that China has rich solar energy resources – especially in areas such as Qinghai, Xinjiang, Gansu, and Inner Mongolia – which can be used to boost the local energy supply. The white paper encouraged the construction of distributed photovoltaic power generation systems in buildings in the central and eastern regions of China. The document also tackled the use of other renewable energy sources such as biomass. The authors estimated that non-fossil sources would comprise 11.4 % of China's primary energy consumption in 2015 and 15 % in 2020.[339] These targets corresponded to the commitments outlined in the

337 Guojia fazhan gaige wei guanyu yinfa kezaisheng nengyuan zhong-changqi fazhan guihua de tongzhi (fa gai nengyuan [2007] 2174 hao) (国家发展改革委关于印发可再生能源中长期发展规划的通知 (发改能源 [2007] 2174号)), Guojia fazhan he gaige weiyuanhui (国家发展和改革委员会), August 31, 2007, http://www.ndrc.gov.cn/zcfb/zcfbghwb/200709/W020140220601800225116.pdf.

338 Zhongguo de nengyuan zhengce (2012) baipishu (中国的能源政策（2012）白皮书), Xinhua (新华), Zhongyang zhengfu menhu wangzhan (中央政府门户网站), October 24, 2012, http://www.gov.cn/jrzg/2012-10/24/content_2250377.htm.

339 *Ibidem.*

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

13th Five-Year Plan (2016–2020), which called for an increase in the share of non-fossil fuels in primary energy consumption to 15 % and 20 % by 2020 and 2030, respectively.[340] It is worth clarifying here the Chinese government understands the term 'non-fossil sources' as referring to both renewable energy sources and nuclear energy. They consider the latter to be a reliable source of base load energy that can mitigate the costs of power outages during peak consumption. By emitting much less pollution, such sources reduce China's dependence on coal. Nuclear power plants emit about two thirds of the volume of polluting material that comparable gas-fired power plants do, and only half of the total amount of pollutants emitted by coal-fired plants.

The importance of renewable energy sources was again highlighted in the Environmental Protection Law (中华人民共和国环境保护法) of December 26, 1989. An amendment to this law took place on April 24, 2014 and came into force on January 1, 2015.[341] The law explicitly stated that the government would promote clean production, recycling, and use of clean energy. It further emphasized that businesses should give priority to the use of clean energy and work toward more efficient uses of natural resources and the reduction of emissions while promoting and developing waste treatment technologies (Article 40).

In November 2014, the above law's provisions directly enabled the adoption of the State Council's Energy Development Strategic Action Plan (2014–2020) (能源发展战略行动计划（2014–2020年）). This plan set a ceiling for primary energy consumption – 4.8 billion tons of carbon equivalent in 2020. Its overarching goal was to reduce energy consumption per unit of GDP based on the use of more efficient, cleaner, and innovative solutions in energy production and consumption. The measures taken under the plan were aimed at gradually reducing the share of coal in the energy mix while increasing reliance on natural gas, nuclear energy, and renewable energy. The document envisaged a reduction in the share of coal in total primary energy consumption to less than 62 %, with a simultaneous increase in the share of renewable sources and natural gas to 15 % and 10 % in 2020, respectively. It also posited a significant increase in installed capacity for wind and solar power generation. The plan took stock of regionally differentiated energy policies and recognized the importance of fostering such differentiation, taking into account the importance of competitive new and re-

340 Kezaisheng nengyuan fazhan "shisanwu" guihua (可再生能源发展"十三五"规划), Guojia fazhan he gaige weiyuanhui (国家发展和改革委员会), December 2016, http://www.ndrc.gov.cn/zcfb/zcfbghwb/201612/W020161216661816762488.pdf.

341 Zhonghua renmin gongheguo huanjing baohu fa (zhuxi ling di 9 hao) (中华人民共和国环境保护法 (主席令第九号)), Zhongyang zhengfu menhu wangzhan (中央政府门户网站), April 24, 2014, http://www.gov.cn/zhengce/2014-04/25/content_2666434.htm.

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newable energy sources and the implementation of renewable energy projects in rural areas.[342]

As the government began to roll out a coordinated effort to diversify the country's energy sources (moving from the traditional dominance of coal to cleaner energy sources), there was a need to rebuild the existing management structure of the energy sector. Until the turn of the millennium, the energy sector was monopolized by the State Power Corporation of China, established in 1996. In December 2002, the State Council's previously formulated reform plan for the energy sector led to the creation of a distributed network comprising the State Grid Corporation of China, China Southern Power Grid, China Huaneng Group, China Datang Corporation, China Huadian, China Guodian, and China Power Investment Corporation. An independent regulatory authority – the State Electricity Regulatory Commission, or SERC – was established in March 2003. At the same time, the National Development and Reform Commission was established, reporting directly to the State Council and responsible for formulating and implementing national strategies for economic and social development. In 2003, the National Energy Bureau was set up within the framework of the National Development and Reform Commission, exercising on all high-level administrative and planning functions related to the energy sector. In July 2008, the National Energy Administration was established, taking over all the duties previously vested in the Bureau that were related to the development of energy plans and policies as well as supervision over the energy industry. In addition, in 2010, the National Energy Commission was established to coordinate the development of energy production and to discuss the main problems related to energy security and development in China.

2. Scientific and technological programs supporting clean development

Following the economic reforms initiated in the late 1980s, the authorities in Beijing saw a need to invest in the development of modern energy technologies, incorporating them into national research and development programs. Although China had already started to implement small hydropower projects in the 1950s, they had not been widely integrated into nationwide scientific programs. Thus, in 1982, China launched the National Program for Key Science & Technology

342 Guowuyuan bangongting guanyu yinfa nengyuan fazhan zhanlüe xingdong jihua (2014–2020 nian) de tongzhi (gua ban fa [2014] 31 hao) (国务院办公厅关于印发能源发展战略行动计划（2014–2020年）的通知 (国办发 [2014] 31号)), Guowuyuan bangongting (国务院办公厅), June 7, 2014, http://www.gov.cn/zhengce/content/2014-11/19/content_9222.htm.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

Projects (国家科技支撑计划). This was the first and largest R&D program in the 20th century in China, and it became the benchmark for four consecutive five-year economic development plans implemented at the central level.

The strategic objectives of this program involved developing new scientific and technological solutions as a driving force for medium- and long-term economic and social development plans, modernizing traditional industries, and optimizing existing industrial structures. The program was also intended to support the development of high-tech solutions, promote sustainable development, and improve the Chinese population's standard of living based on innovative solutions. The program signaled a need for environmental protection and rational use of resources. It explored the applications and applicability of modern technologies in the field of pollution control in urbanized areas and in the rational use of water resources. It also examined the measures needed to improve the state of local ecosystems, intensify technical research in the areas of prospecting and exploration as well as the development of China's raw material and mineral base (mainly oil and gas), introduce early warning and forecasting systems to prevent and limit the impact of natural hazards, and promote sustainable social development.

In March 1986, a group of four scientists – Wang Ganchang, Chen Fangyun, Wang Daheng, and Yang Jiachi – sent a letter to Deng Xiaoping and the Central Committee of the Communist Party of China. In this letter, titled "Proposal on Tracking and Studying Foreign Developments of Strategic High Technology" (关于跟踪研究外国战略性高技术发展的建议), they called for the government to thoroughly examine the strategic development of advanced technologies abroad. These recommendations led to the creation of the National High-tech Research and Development Program (国家高技术研究发展计划), more commonly referred to as the Program 863 (863计划). The core mission of Program 863 was to accelerate high-tech development in China. The program focused on stimulating innovation in strategic high-tech sectors, allowing China to strengthen its position in global markets. At the same time, it identified seven priority sectors: biotechnology, space technology, information technology, laser technology, automation technology, energy technology, and new materials. An additional marine technology sector was included in 1996. The most important goal of the program was to monitor international trends and narrowing the gap between China and the most technologically advanced countries. The program also tackled the development of environmental and resource protection technologies as well as energy technologies, all in the interest of promoting sustainable development.

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In 1988, Deng Xiaoping observed that global development – especially in the field of advanced technologies – is extremely dynamic and that China must not lag behind, but rather participate in this process.[343] In October 1992, General Secretary Jiang Zemin mentioned "innovation" (创新, *chuangxin*) for the first time in his address to the 14th Congress of the Communist Party of China. He repeatedly stressed the importance of technological innovation thereafter. In May 1995, at the National Conference on Science and Technology, Jiang posited that innovation is the "soul of national progress and a driving force in building national prosperity".[344] While stressing the role of innovation in relation to China's ongoing strategy of national rebirth through science and education, he pointed out the importance of conducting basic research and presenting original scientific achievements.[345]

In 1997, the government announced the creation of the National Basic Research Program (国家重点基础研究发展计划), also called Program 973 (973计划). The program was interdisciplinary in nature and argued for the need for basic research in key sectors and areas to achieve sustainable economic and social development. These areas included agriculture, energy, information technology, environmental protection and natural resources, population, health, new materials, and related fields. The program promoted changes within the national industrial structure based on advanced technologies, advancing computerization, improvements in the quality of life and health of the population, effective management of natural resources, ecological development, and the development of China's western regions. It was intended to create a solid scientific and technical basis for sustainable social and economic development, based on furthering scientific training, fostering scientific talent, and creating national research centers to improve the country's capacity for innovation.[346]

343 *Deng Xiaoping: Zhongguo bixu zai shijie gao keji lingyu zhanyou yixizhidi* (邓小平：中国必须在世界高科技领域占有一席之地), Renmin wang (人民网), October 24, 1988, http://scitech.people.com.cn/GB/25509/56813/57267/57268/4001849.html.

344 *Chongwen Mao Zedong Deng Xiaoping Jiang Zemin guanyu keji he chuangxin di lunshu* (重温毛泽东邓小平江泽民关于科技和创新的论述), Renmin wang (人民网), January 8, 2006, http://scitech.people.com.cn/GB/53753/4007451.html.

345 Jiang Zemin (江泽民), *Yao guli yuanshixing chuangxin* (2001 nian 6 yue 22 ri) (《要鼓励原始性创新》(2001年6月22日) [in:] *Jiang Zemin wenxuan* (江泽民文选; Selected Works of Jiang Zemin), vol. 3, Renmin chubanshe (人民出版社), Beijing 2006, p. 262; Jiang Zemin (江泽民), *Zai quan dang quan shehui dali hongyang kexue jingshen he chuangxin jingshen* (2000 nian 6 yue 5 ri) (《在全党全社会大力弘扬科学精神和创新精神》(2000年6月5日) [in:] *Jiang Zemin wenxuan* (江泽民文选; Selected Works of Jiang Zemin), vol. 3, Renmin chubanshe (人民出版社), Beijing 2006, p. 34–35.

346 Guojia zhongdian jichu yanjiu fazhan jihua jianjie (国家重点基础研究发展计划简介), https://archive.is/ipqrE#selection-225.0-225.14; https://archive.is/20121227162133/http://www.973.gov.cn/Default_3.aspx; National Basic Research Program of China (973 Pro-

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

In terms of project management, the government introduced the so-called 2+3 rule, according to which all projects would be subject to an evaluation two years after their launch, which in turn would determine the plan for the following three years. Specialized advisory groups from relevant scientific fields were tasked with supervising project implementation, tracking progress, and presenting their recommendations to the Ministry of Science and Technology. On this last point, the advisory typically lobbied for support for key projects that offered the prospect of breakthrough discoveries. The program emphasized the importance of international cooperation and academic exchange.[347] It was geared toward promoting breakthrough research and innovation in areas of far-reaching and strategic importance, primarily in the life sciences, nanotechnology, information technology, and earth sciences.

The National Medium- and Long-Term Plan for the Development of Science and Technology (2006–2020) (国家中长期科学和技术发展规划纲要 (2006–2020年)), presented by the State Council in February 2006, highlighted the importance of research, technological development, and innovation. It established the goal of increasing the share of government expenditure on research and development to 2.5 % of China's GDP by 2020. The Plan advanced that, by that time, the contribution of science and technology to the economy would be at least 60 %, while China's dependence on technologies from abroad would fall below 30 %. The number of patents filed by Chinese entities and the number of citations of Chinese scholars in scientific publications were expected to increase significantly, with the aim of placing China among the top five countries the world on both metrics. The Plan indicated that the government would encourage large companies to set up research and development and distribute R&D tasks accordingly.

The document also identified 11 priority areas for economic and social development. These are: energy, water and mineral resources, environment, agriculture, manufacturing, transport, the information and high-tech services industry, population and health, urbanization and development, public safety, and national defense. With respect to energy, the Plan gave critical weight to the development of clean (water, wind, solar, biomass) and relatively clean (nuclear) energy sources, efficient use of energy, the development of energy-saving technologies, the promotion of clean coal consumption technologies, and reducing environmental pollution. Finally, the Plan emphasized optimizing distribution mechanisms and developing protective measures for mineral and marine resources.

gram), Ministry of Science and Technology of the People's Republic of China, http://www.most.gov.cn/eng/programmes1/200610/t20061009_36223.htm.

347 *Ibidem.*

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The Plan also tackled environmental protection issues, including integrated pollution prevention and control, waste management and recycling, restoration of ecosystems in environmentally sensitive areas, protection of the marine environment, implementation of regional environmental management systems, and improvements to the country's environmental quality monitoring system.[348] However, the substance of the Plan largely reflected the problems of scientific and technological development facing China in the early 21st century. The rapidly growing number of patents filed by China did not lead to a breakthrough because they were often too narrow in scope. Few of the resulting solutions ultimately reached widespread implementation in the industry. Unlike the highly developed Western countries, where the industry initiates research and development, China had chosen the path of channeling research through a centrally controlled system. As a result, innovative solutions were characterized by fairly modest commercial potential, which constituted a serious barrier to their implementation on the market. At the same time, China was not very concerned about its deployment capabilities, leading to increasing dependence on foreign technologies. Moreover, this dependence was a consequence of the state's actions, which created a broad system of incentives for multinational companies and enabled them to enter a huge market in exchange for consent to transfer their technology and intellectual property. Over time, however, China has recognized that technology owners who enjoy a privileged position in international production and supply chains ultimately reap the greatest profits.

In June 2010, the government presented the National Long-Term Talent Development Program (2010–2020) (国家中长期人才发展规划纲要 (2010–2020年)), which highlighted the importance of developing human capital and talents, which would allow China to increase its competitive advantage. It stressed that this would have a major impact on social and economic development, especially in key areas such as environmental protection and the development of the new energy sector. The document noted that several key areas require high-level specialists. Thus, by 2020, China would need 5 million specialists in areas related to the production of equipment, computerization, biotechnology, new materials, aviation, maritime affairs, finance, international business, ecology and environmental protection, energy resource management, modern transportation, and agricultural science and technology. In the areas of education, politics, ad-

348 Guojia zhong-changqi kexue he jishu fazhan guihua gangyao (2006–2020 nian) (国家中长期科学和技术发展规划纲要（2006–2020年)), Xinhua (新华), Zhongyang zhengfu menhu wangzhan (中央政府门户网站), February 9, 2006, http://www.gov.cn/jrzg/2006-02/09/content_183787.htm.

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vertising, ideology and culture, medicine and health, disaster prevention, and others, these needs were estimated at more than 8 million professionals.[349]

In September 2009, a symposium was organized on the strategic development of industry in China, the development of new energy sources, energy efficiency, environmental protection, and electromobility. The event featured academics from the Chinese Academy of Sciences and Chinese Academy of Engineering, representatives of universities, companies, and selected research institutes. Prime Minister Wen Jiabao, who participated in the event, stressed that the emerging new industries should boost the development of the global economy and become a strategic choice for China.[350] Most of the suggestions presented during this symposium were reflected in a document on the development of strategic industries, presented by the State Council in October 2010 (国务院关于加快培育和发展战略性新兴产业的决定). The document identifies seven priority areas: environmental protection and limiting energy use, new information technologies, biotechnology, production of specialized equipment, new energy sources, new materials, and vehicles running on clean energy. The plan also stressed the importance of energy efficiency and environmental protection, recycling, the dissemination of clean and renewable energy sources, the development of smart grids, and the popularization of plug-in hybrids and electric vehicles.[351]

On May 19, 2015, the State Council presented a strategic plan titled "Made in China 2025" (中国制造 2025), which identified ten innovative industries that were supposed to bolster the Chinese economy and its international competitiveness. This included new-generation information technology, robotics, aerospace equipment, ocean engineering and high-tech ships, modern railway equipment, energy-efficient electric vehicles, power equipment, agricultural machinery, new materials, and biotechnology and advanced medical equipment.[352]

349 Guojia zhong-changqi rencai fazhan guihua gangyao (2006–2020 nian) (国家中长期人才发展规划纲要（2010－2020年）), Xinhua (新华), Zhongyang zhengfu menhu wangzhan (中央政府门户网站), June 6, 2010, http://www.gov.cn/jrzg/2010-06/06/content_1621777.htm.

350 *Wen Jiabao zhuchi zhaokai sanci xinxing zhanlüexing chanye fazhan zuotan hui* (温家宝主持召开三次新兴战略性产业发展座谈会), Guowuyuan bangongting (国务院办公厅), Zhongyang zhengfu menhu wangzhan (中央政府门户网站), September 22, 2009, http://www.gov.cn/ldhd/2009-09/22/content_1423493.htm.

351 Guowuyuan guanyu jiakuai peiyu he fazhan zhanlüexing xinxing chanye de jueding (国务院关于加快培育和发展战略性新兴产业的决定), Guowuyuan bangongting (国务院办公厅), Zhongyang zhengfu menhu wangzhan (中央政府门户网站), October 18, 2010, http://www.gov.cn/zwgk/2010-10/18/content_1724848.htm.

352 Guowuyuan guanyu yinfa "Zhongguo zhizao 2025" de tongzhi (guo fa [2015] 28 hao) (国务院关于印发《中国制造2025》的通知 (国发 [2015] 28号)), Guowuyuan (国务院), May 19, 2015, http://www.gov.cn/zhengce/content/2015-05/19/content_9784.htm.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

The Made in China 2025 program was anchored in the 'Industry 4.0' concept, announced in 2011 at the Hanover Messe trade fair as a path to navigate Fourth Industrial Revolution. The main goals of the program are to be achieved within ten years. By then, China expects to increase the share of domestic components and materials in highly processed products to 40 % in 2020 and 70 % five years later. The program underscored the development of intelligent production, with a focus on reducing the operating costs of pilot projects, shortening the production cycle, and reducing the proportion of faulty products. It envisioned financial support mechanisms for the creation of innovative production centers and improvements in China's intellectual property protection standards. The plan also provided for the development of an energy-efficient and environmentally friendly production system.[353] In line with these aspirations, China set a target of reducing CO_2 emissions in major industrial sectors by 20 % by 2020 and taking major strides toward the construction of a green production system by 2025.[354]

In December 2015, Xi Jinping argued that, in order to achieve stable economic growth, the country should pay more attention to structural reform on the supply side.[355] This argumentation set the stage for the economic roadmap outlined in the 13th Five-Year Plan (2016–2020) and became the key to achieving the goal of building a "moderately prosperous society in all respects" by 2020. In practice, China's supply-side structural reforms are intended to contribute to a better use of the means of production, i. e. capital, skilled labor resources, equipment, and technology. They highlight the importance of increasing productivity and competition on the supply side while disregarding traditional stimulus measures.

A year later, in December 2016, the State Council presented a strategy to develop selected strategic industries by 2020. It reiterated the objective of boosting the contribution of strategic emerging industries to 15 % of GDP by 2020, mainly in sectors related to IT, high-quality industrial production, biotechnology, green and low-carbon solutions, and digitization. According to final plan, the development of strategic industries is to become the foundation for the sustainable and healthy development of the Chinese economy by 2030. China aspires to become an important global manufacturing and innovation hub for strategic industries, creating a group of leading and internationally innovative companies. The 2016 strategy prioritized developing new electric vehicles, re-

353 Łukasz Gacek, *Nowe źródła wzrostu gospodarczego Chin: Wiedza i innowacje*, "Roczniki Humanistyczne. Sinologia" 66(9) (2018).

354 Guowuyuan guanyu yinfa "Zhongguo zhizao 2025" de tongzhi, *op. cit.*

355 *Zhongyang jingji gongzuo huiyi tichu 2016 nian wuda renwu* (中央经济工作会议提出2016年五大任务), Zhongguo xinwen wang (中国新闻网), December 21, 2015, http://politics.people.com.cn/n1/2015/1221/c1001-27957752.html.

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ducing energy consumption, and promoting environmental protection in order to implement a holistic model of sustainable development in the country.[356]

China's innovative development goals are in line with the current Party leadership's ambition to achieve a "great revival of the Chinese people." Thus, it came as no surprise that, during the 19th Congress of the Communist Party of China, President Xi Jinping emphasized the role of innovation and quality in the economy, and his plan envisaged the implementation of socialist-style modernization by 2035 and the transformation of China into a rich and powerful socialist state by 2050 based on innovative solutions.[357] The innovative development plan, which is grounded primarily in the Made in China 2025 program, is intended to allow China to move up the global supply chain and value chain. So far, China has only participated in some stages of production, focusing on the export of final goods. The proposed systemic changes are aimed at creating new sources of economic growth and developing new branches of the economy that rely on information technologies, collecting vast troves of data, processing them, and then using them throughout the entire production process.

This new approach is also a response to the slowdown in GDP growth observed in recent years and the ongoing trade dispute with the United States. Due to planning errors and inefficiencies in the allocation of funds, which resulted in overcapacity, the government provides financial support to selected new industries, stimulating demand based on tax incentives. However, dependence on foreign supplies of key components remains a major challenge. China is trying to eliminate these weaknesses by investing in research; as a result, the share of R&D spending in relation to GDP is already higher in China than in the EU. According to World Bank data, China allocated 2.13 % of its GDP to research and development in 2017, while the EU average was 2.06 % of GDP.[358]

356 Guowuyuan guanyu yinfa "shisanwu" guojia zhanlüexing xinxing chanye fazhan guihua de tongzhi (guo fa [2016] 67 hao) (国务院关于印发"十三五"国家战略性新兴产业发展规划的通知 (国发 [2016] 67号)), Guowuyuan (国务院), November 29, 2016, http://www.gov.cn/zhengce/content/2016-12/19/content_5150090.htm.

357 Zhonggong shijiu da kaimu Xi Jinping daibiao shiba jie zhongyang weiyuanhui zuo baogao (中共十九大开幕习近平代表十八届中央委员会作报告), Zhongguo wang (中国网), October 18, 2017, http://www.china.com.cn/cppcc/2017-10/18/content_41752399.htm.

358 *Research and development expenditure (% of GDP)*, The World Bank, https://data.worldbank.org/indicator/GB.XPD.RSDV.GD.ZS.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

3. Changes in China's energy structure

The development of clean energy technologies in China derives from the actions of the governments, which approaches this development from a strategic standpoint. China has adopted a number of new policies and laws aimed at improving energy efficiency and increasing the share of renewable energy in the final stage of energy consumption. Based on its own experience and external inspiration, China has created a clean energy sector in close synergy with its economic system. Although coal has been the main raw material in energy production for years (Table 13), China has already spent more than ten years implementing solutions to transform the existing energy mix and reduce the share of coal in the energy balance. The 11th Five-Year Plan (2006–2010) was the first to set an energy conservation target of 20 % and adopted a number of legal, administrative, and economic solutions to meet this commitment.

Table 13. Total energy consumption by source (%)

	1978	1990	2000	2005	2010	2015	2016	2017
Coal	70.7	76.2	68.5	72.4	69.2	63.7	62.0	60.4
Crude oil	22.7	16.6	22.0	17.8	17.4	18.3	18.5	18.8
Natural gas	3.2	2.1	2.2	2.4	4.0	5.9	6.2	7.0
Primary electricity and other energy	3.4	5.1	7.3	7.4	9.4	12.1	13.3	13.8

Source: *Total Consumption of Energy and Its Composition*, China Statistical Yearbook, Beijing 2018, http://www.stats.gov.cn/tjsj/ndsj/2018/indexeh.htm

China's scarce oil and gas resources are pushing the government toward more widespread use of clean and renewable energy sources. This is furthered by the fact that China has an enormous supply of renewable sources and presents great potential for future development. As early as 2013, China had installed more renewable energy capacity over the course of a year than all of Europe and the Asia-Pacific region put together.[359] According to government plans, non-fossil sources should account for 15 % of primary energy consumption by 2020. At the same time, the share of natural gas is to be no less than 10 %, while the share of coal is likely to fall below 58 %. The government is expected to increase the share of non-fossil sources in total energy consumption to 20 % by 2030 – the year that China will likely reach its peak carbon dioxide emissions.

Today, China is the largest primary energy consumer in the world. In 2018, the country accounted for 23.6 % of global energy consumption. For comparison, the

359 *Renewables 2014 Global Status Report*, Renewable Energy Policy Network for the 21st Century (REN21), https://www.ren21.net/wp-content/uploads/2019/05/GSR2014_Full-Report_English.pdf.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

United States was responsible for 16.6 % of all energy consumption, while all of Europe accounted for 14.8 %. China's final energy consumption between 2007 and 2017 grew by 3.9 % per year, on average.[360] Over the last two decades, consumption has more than tripled (Table 14). Despite such a significant increase, it should be noted that energy consumption *per capita* was almost three times lower in China than in the United States and twice as low as in the average of the developed OECD countries.[361]

Table 14. Primary energy consumption in China

	2000	2005	2010	2015	2017	**2018**	**2018** (% of total)	Growth rate per annum	
								2017	2007–2017
Oil equivalent (millions of tons)	1,038.2	1,691.5	2,491.6	3,009.6	3,139.0	**3,273.5**	**23.6 %**	4.3 %	3.9 %

Source: own work based on: *BP Statistical Review of World Energy 2019*, BP, June 2019, p. 8, https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/statistical-review/bp-stats-review-2019-full-report.pdf; *BP Statistical Review of World Energy 2011*, BP, June 2011, p. 40, http://large.stanford.edu/courses/2011/ph240/waisberg1/docs/bp.pdf

The industrial sector is responsible for the largest percentage of energy consumption in China (Table 15) – 70 % in 2016. The housing sector (12 %) and the transportation sector (9 %) took a distant second and third place, respectively.[362] Advancing industrialization will undoubtedly determine the actions that the government will take to reduce the Chinese economy's energy use and increase the role of non-fossil energy sources.

In 2018, total electricity consumption in China stood at 68,449 TWh – 8.5 % more than the year before. Growth was mainly driven by the industrial sector, particularly the high-tech and information equipment manufacturing industries (Table 16). Other important factors included progressing urbanization, growing household consumption of electricity, and increasing overall standards of living in China.

360 *BP Statistical Review of World Energy 2019*, BP, June 2019, https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/statistical-review/bp-stats-review-2019-full-report.pdf.

361 *Ibidem.*

362 *Consumption of Energy by Sector* (2016), China Statistical Yearbook, Beijing 2018, http://www.stats.gov.cn/tjsj/ndsj/2018/indexeh.htm.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

Table 15. Consumption of energy by sector (2016)

Sector	Total energy consumption (10,000 tons of SCE)
Total consumption	435,818.63
Agriculture, forestry, animal husbandry, and fisheries	8,544.06
Industry – Mining and extraction – Manufacturing – Electric power, gas and water production and supply	290,255.00 17,425.61 242,514.87 30,313.58
Construction	7,990.93
Transport, storage, and post	39,651.21
Wholesale and retail trade, hotels and restaurants	12,015.23
Others	23,154.47
Residential consumption	54,208.66

Source: *Consumption of Energy by Sector* (2016), China Statistical Yearbook, Beijing 2018, http://www.stats.gov.cn/tjsj/ndsj/2018/indexeh.htm

Table 16. Electricity consumption and rate increase by industry (2018)

	Electricity consumption (TWh)	YoY (%)
Primary industry	728	9.8
Secondary industry	47,235	7.2
Tertiary industry	10,801	12.7
Residential	9,685	10.4
Total	68,449	8.5

Source: Guojia nengyuan ju fabu 2018 nian quanguo dianli gongye tongji shuju (国家能源局发布2018年全国电力工业统计数据), Guojia nengyuan ju (国家能源局), January 18, 2019, http://www.nea.gov.cn/2019-01/18/c_137754977.htm

According to BP's report on energy market prospects, China will maintain its position as the largest energy consumer in the world until 2040. By then the country will account for 22 % of global energy consumption, compared to 23 % in 2017. It is estimated that, between 2017 and 2040, energy consumption and production in China will increase by 28 % and 29 %, respectively.[363] China's total energy consumption in 2018 was 4.64 billion tons of standard coal equivalent – a year-on-year increase of 3.3 %. The scarcity of high-quality raw material resources limits China's energy capacity. The national energy mix is dominated by coal, whose share in 2018's total energy consumption was 59 % (a decrease of 1.4 % over the previous year), while clean sources – natural gas, nuclear energy,

363 *BP Energy Outlook – 2019. Insights from the Evolving Transition Scenario – China*, BP, 2019, https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/energy-outlook/bp-energy-outlook-2019-country-insight-china.pdf.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

and renewable energy –cumulatively account for 22.1 % (an increase of 1.3 %). Non-fossil sources (among which China counts nuclear energy) comprised 14.3 % of total consumption, while natural gas made up 7.8 %.[364]

China accounts for nearly half of the world's coal consumption, mainly in conventional power plants. Total coal consumption in 2018 reached 3.9 billion tons – a 1 % increase over the previous year.[365] China also remains the largest coal producer in the world. In 2018, output increased by 4.5 % to 3.68 billion tons,[366] which means that production exceeded the level stipulated in the 'controlled coal extraction' scenario by 200 million tons.[367] This figure – the highest in more than three years – is mainly due to increased demand during the winter and new mines opening across the country. In 2018, China approved a number of new mining projects collectively worth more than 45 billion RMB (about 6.3 billion USD) – much more than in 2017.[368] In the period between January and June 2019, permits were issued for the construction of new coal mining sites with a cumulative production capacity of 141 million tons, compared to 25 million tons for the whole of 2018. According to instructions issued by the National Energy Administration, these activities should encourage the consolidation of production in the main national mining centers located in Inner Mongolia, Xinjiang, Shanxi, and Shaanxi, as well as the expansion of existing mines. As a result of these measures, Chinese coal production increased by 2.6 % in the first six months of 2019 to 1.76 billion tons.[369]

The parallel increase in coal imports is also noteworthy. Since 2008, China has remained a net importer of coal. In 2018, the country imported more than 281 million tons of coal – nearly 4 % more than in the previous year.[370] In recent years,

364 Zhongguo nengyuan fazhan baogao 2018 (中国能源发展报告2018), Zhongguo nengyuan bao (中国能源报), Beijixing fengli fadian wang (北极星风力发电网), April 29, 2019, http://news.bjx.com.cn/html/20190429/977730.shtml.

365 *Ibidem.*

366 *Ibidem.*

367 *Zhongguo meitan hangye "shisanwu" mei kong zhongqi pinggu ji houqi zhanwang* (中国煤炭行业"十三五"煤控中期评估及后期展望), Zhixing baogao (执行报告), Zhongguo meitan xiaofei zong liang kongzhi fang'an he zhengce yanjiu (中国煤炭消费总量控制方案和政策研究), Meitan gongye guihua sheji yanjiuyuan (煤炭工业规划设计研究院), May 2019, p. 18, http://coalcap.nrdc.cn/Public/uploads/pdf/15572352061857381338.pdf.

368 Meng Meng / Dominique Patton, *China December coal output rises about 2 percent to highest in over three years*, Reuters, January 21, 2019, https://www.reuters.com/article/us-china-economy-output-coal/china-december-coal-output-rises-about-2-percent-to-highest-in-over-three-years-idUSKCN1PF09L?il=0.

369 David Stanway / Xu Muyu, *China coal mine approvals surge despite climate pledges*, Reuters, August 16, 2019, https://www.reuters.com/article/us-china-coal-climate/china-coal-mine-approvals-surge-despite-climate-pledges-idUSKCN1UW0EM.

370 *2018 nian guomin jingji he shehui fazhan tongji gongbao* (2018年国民经济和社会发展统计公报), Guojia tongji ju (国家统计局), February 28, 2019, http://www.stats.gov.cn/tjsj/zxfb/201902/t20190228_1651265.html.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

the number of coal mines has gradually decreased from 8,100 in 2016 to about 5,800 in 2018,[371] thus achieving the target of reducing the number of plants to 6,000 in 2020, as per the in the 13th Five Year Plan. By the end of the year, the share of large mines in coal production is expected to be reach 80 %. The second largest source of energy production in China is oil. China has been a net importer of oil since 1993. In 2018,China relied on imports for 71 % of its oil supply. The same applies to natural gas. Due to the rapidly growing consumption of gas, 43 % of China's natural gas comes from abroad, rendering the country highly reliant on external suppliers.[372] The trend of increasing dependence on imports will undoubtedly continue in the coming years.

Table 17. Share of individual energy sources in total energy consumption (%)

	2017	**2018**
Coal	60.4	59.0
Crude oil	18.7	18.8
Hydroelectric power	8.2	8.2
Natural gas	7.0	7.8
Wind energy	2.1	2.4
Nuclear energy	1.7	2.0
Solar energy	0.8	1.2
Other	1.0	0.6

Source: own work based on: Zhongguo nengyuan fazhan baogao 2018 (中国能源发展报告 2018), Zhongguo nengyuan bao (中国能源报), Beijixing fengli fadian wang (北极星风力发电网), April 29, 2019, http://news.bjx.com.cn/html/20190429/977730.shtml

China's energy production reached 3.77 billion tons of standard coal equivalent in 2018 – a 5 % increase over 2017. At the same time, the share of coal in electricity production gravitated toward 70 % (Table 18).

The total installed capacity of all power plants in China at the end of 2018 was 1,900 GW. In 2018 alone, China added 120 GW of new capacity. It should be noted, however, that non-fossil sources generated as much as 73 % of the newly added power.[373] The potential of renewable energy connected to the grid in China increased by 12 % in 2018 to over 728GW (38.3 % of total installed capacity, 1.7 %

371 *Zhongguo meitan hangye "shisanwu" mei kong zhongqi pinggu ji houqi zhanwang*, op. cit.
372 Zhongguo nengyuan fazhan baogao 2018, *op. cit.*
373 Zhong dian lian fabu "2018–2019 niandu quanguo dianli gongxu xingshi fenxi yuce baogao" (中电联发布《2018–2019年度全国电力供需形势分析预测报告》), Zhongguo dianli qiye lianhe hui (中国电力企业联合会), January 29, 2019, http://www.cec.org.cn/yaowenkuaidi/2019-01-29/188578.html.

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Table 18. Production of electricity by source (%)

	2018
Coal	69.1
Hydroelectric power	10.1
Crude oil	7.1
Natural gas	5.6
Wind energy	3.0
Nuclear energy	2.4
Solar energy	1.4
Other	1.3

Source: own work based on: Zhongguo nengyuan fazhan baogao 2018 (中国能源发展报告 2018), Zhongguo nengyuan bao (中国能源报), Beijixing fengli fadian wang (北极星风力发电网), April 29, 2019, http://news.bjx.com.cn/html/20190429/977730.shtml

Table 19. Installed renewable energy capacities (2018)

	New installed capacity (GW)	Total installed capacity (GW)	YoY (%)
Hydro	8.54	352.26	+2.5
Wind	20.59	184.26	+12.4
Solar	44.26	174.63	+33.9
Biomass	3.05	17.81	+20.7
Total		**728.96**	**+11.7**
Thermal		1143.67	+3.0
Nuclear		44.66	+24.7

Source: own work based on: Guojia nengyuan ju fabu 2018 nian quanguo dianli gongye tongji shuju (国家能源局发布2018年全国电力工业统计数据), Guojia nengyuan ju (国家能源局), January 18, 2019, http://www.nea.gov.cn/2019-01/18/c_137754977.htm

more than in 2017).[374] Nevertheless, conventional coal-fired power plants still provide more than half of China's generation capacity (Table 19).

At the same time, rising efficiency increased the amount of electricity generated from renewable sources to 1.87 trillion kWh in 2018 (170 billion kWh more than the year before). Renewable energy accounted for 26.7 % of electricity production, 0.2 % more than in 2017. Total electricity consumption in the country was about 6.8 trillion kWh, with an annual increase of 8.5 % (Table 8).

374 2018 nian kezaisheng nengyuan bing wang yun hang qingkuang jieshao (2018年可再生能源并网运行情况介绍), Guojia nengyuan ju (国家能源局), January 28, 2019, http://www.nea.gov.cn/2019-01/28/c_137780519.htm.

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Table 20. Power generated by renewable energy

	Billion kWh	YoY %	Energy wasted (billion kWh)
Hydro	1,223.9	+3.2	69.1
Wind	366.0	+21.0	27.7
Solar	177.5	+50.8	5.49
Biomass	90.6	+14.0	N/A
Nuclear	294.4	+18.6	2.4

Source: own work based on: Zhongguo nengyuan fazhan baogao 2018 (中国能源发展报告 2018), Zhongguo nengyuan bao (中国能源报), Beijixing fengli fadian wang (北极星风力发电网), April 29, 2019, http://news.bjx.com.cn/html/20190429/977730.shtml

The importance of clean and renewable energy sources in China is expected to grow steadily over the coming years. BP forecasts that the share of coal will fall to 35 % in 2040 from 60 % in 2017. In the same period the contribution of natural gas is expected to increase from 7 % to 14 %, while that of renewable energy sources will grow from 3 % to 18 %. Demand for oil (+19 %), natural gas (+166 %), renewable energy sources (+553 %), nuclear energy (+405 %), and hydropower (+31 %) will increase. At the same time, coal will see a sharp decline (-25 %). Demand for coal peaked in 2013. Despite this, China will remain the world's largest coal consumer in the period in question, accounting for 39 % of global growth of demand until 2040. The carbon peak should take place around 2022.[375]

4. Renewable energy resource use

For several years now, China has been the largest investor in green energy in the world (Table 21). According to calculations by Bloomberg NEF (BNEF), in 2018, global investments in clean energy totaled 332.1 billion USD, but fell 8 % from the previous year. This was the fifth year in a row in which such investments exceeded 300 billion USD. Investments in wind energy increased by 3 % to 128.6 billion USD. On the opposite end, investments in the solar power industry decreased by 24 % to 130.8 billion USD, largely due to sharp decreases in production costs. Manufacturers reduced their sale prices in light of the volume of excess photovoltaic modules on the world market. A policy change in China that limited access to feed-in tariffs for new projects also partially explains this phenomenon.

375 *BP Energy Outlook – 2019. Insights from the Evolving transition scenario – China, op. cit.*

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In 2018, Chinese investment in solar energy fell by 53 % to 40.4 billion USD compared to the same period a year earlier.[376]

Table 21. Clean energy investment volumes by country for 2018 (top 10)

	Investment volume (billion USD)	Change from 2017 (%)
China	100.1	-32 %
United States	64.2	+12 %
Europe	74.5	+27 %
Japan	27.2	-16 %
India	11.1	-21 %
Germany	10.5	-32 %
Great Britain	10.4	+1 %
Australia	9.5	+6 %
Spain	7.8	+700 %
The Netherlands	5.6	+60 %
Sweden	5.5	+37 %
France	5.3	+7 %

Source: *Clean Energy Investment Exceeded $300 Billion Once Again in 2018*, Bloomberg NEF, January 16, 2019, https://about.bnef.com/blog/clean-energy-investment-exceeded-300-billion-2018/#_ftn1

In this comparison, China ranks first in volume of investments in renewable energy sources, with investments of 100.1 billion USD (a 32 % decrease compared to 2017).[377] Since 2005, China has seen a spectacular increase in investment in green energy (Table 22).

In a study on the renewable energy market and its prospects for 2018–2023 titled *Renewables 2018*, the International Energy Agency (IEA) presented trends in the development of renewable energy in the electricity, heating, and transportation industries worldwide. The study suggested that, by 2023, renewable energy sources would cover 40 % of the global increase in energy consumption. Their use would increase most rapidly in the electricity sector. Thus, within five years, renewable energy may represent almost one third of all total electricity production in the world. The global growth of renewable energy will be driven mainly by China, which will overtake the European Union in the consumption of

376 *Clean Energy Investment Exceeded $300 Billion Once Again in 2018*, Bloomberg NEF, January 16, 2019, https://about.bnef.com/blog/clean-energy-investment-exceeded-300-billion-2018/#_ftn1.

377 *Clean Energy Investment Trends 2018*, Bloomberg NEF, January 16, 2019, https://data.bloomberglp.com/professional/sites/24/BNEF-Clean-Energy-Investment-Trends-2018.pdf.

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Table 22. China's investment in green energy, 2005–2018 (billion USD)

2005	8.8
2006	11.2
2007	16.8
2008	25.6
2009	38.7
2010	45.0
2011	51.5
2012	62.6
2013	66.9
2014	89.6
2015	125.4
2016	107.2
2017	146.8
2018	100.1

Source: *Clean Energy Investment Trends 2018*, Bloomberg NEF, January 16, 2019, p. 42, https://data.bloomberglp.com/professional/sites/24/BNEF-Clean-Energy-Investment-Trends-2018.pdf

energy from renewable sources. To a large extent, this will be the result of continuing efforts to decarbonize all sectors and reduce air pollution.[378]

Under the 13th Five-Year Plan (2016–2020), China has placed emphasis on developing low-carbon technologies, announcing investments of 2.5 trillion RMB (approximately 361 billion USD) in the development of renewable energy sources (mainly solar and wind power). This was intended to create 13 million new jobs in the renewable energy sector by 2020.[379] Calculations by IRENA (the International Renewable Energy Agency), suggest that, in 2018, nearly 11 million people were employed in the renewable energy sector worldwide, of whom 39 % (4.1 million) were working in China alone. Approximately 1.2 million people worldwide were working in the wind energy sector, 44 % of whom (510,000) were employed in China. Similarly, in the photovoltaic sector, out of 3.6 million employees, as many as 2.2 million, or 61 %, were employed in China. In addition, 670,000 out of the 800,000 people working on solar water heaters across the globe

378 *Renewables 2018. Analysis and Forecasts to 2023*, International Energy Agency (IEA), 2018, https://webstore.iea.org/download/summary/2312?fileName=English-Renewables-2018-ES.pdf.

379 *"Shisanwu" qijian kezaisheng nengyuan zong touzi guimo jiang dadao 2.5 wanyi yuan* („十三五"期间可再生能源总投资规模将达到2.5万亿元), Guojia nengyuan ju (国家能源局), January 5, 2017, http://www.nea.gov.cn/2017-01/05/c_135956835.htm.

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were in China.[380] In 2018, China controlled 69 % and 64 % of the total installed capacity of photovoltaic cells and modules, respectively.[381]

By 2030, wind and solar energy could attract investments on the order of 780 billion USD.[382] Half of the newly installed capacity by 2020 will come from renewable energy sources. The 13th Five-Year Plan (2016–2020) targets a 250-GW increase in installed renewable generation capacity to a total of 770GW.[383] The same Plan envisioned an increase in installed wind power capacity from 131 GW to 210 GW, while solar power generation capacity was expected to increase from 42 GW to 110 GW.[384] In 2018, China put forth new solutions to accelerate its transformation of the energy mix and reduce carbon emissions. In December, the National Development and Reform Commission and the National Energy Administration presented the Clean Energy Consumption Action Plan (2018–2020) (清洁能源消纳行动计划（2018–2020 年)). This strategy defined targets for reducing the losses stemming from clean energy production. The authors of the document stressed that clean energy is an important component in the transformation of the energy structure and drew attention to the insufficient development of this sector in China. The plan set a minimum target of 88 % for the country's average utilization rate of wind power in 2018, 90 % in 2019,and approximately 95 % in 2020 – a target considered ambitious even on the international level. The bar for the utilization rate of solar energy was set at above 95 % (Table 23).[385]

One recurring problem was that the renewable energy potential in regions with surplus energy was not synchronized with the equally rapid development of infrastructure that allowed for long-distance energy transmission to places where it could be used. Renewable energy operators were forced to reduce the power they generated in light of difficulties related to its consumption by the electric power system. The problem has become particularly acute in northern China. The new solutions outlined above were therefore intended to give network op-

380 *Renewable Energy and Jobs Annual Review 2019*, International Renewable Energy Agency (IRENA), p. 15, 17, 25, https://irena.org/-/media/Files/IRENA/Agency/Publication/2019/Jun/IRENA_RE_Jobs_2019-report.pdf.

381 *Ibidem*, p. 14.

382 "Nengyuan zhuanxing jiasudu: Zhongguo fengdian guangfu fadian de xietong xiaoyi" yanjiu baogao (《能源转型加速度：中国风电光伏发电的协同效益》研究报告), Greenpeace, Beijing 2017, http://www.greenpeace.org.cn/wp-content/uploads/2017/04/.pdf.

383 Dianli fazhan "shisanwu" guihua (2016–2020 nian) (电力发展"十三五"规划（2016–2020 年）), Guojia fazhan gaige wei (国家发展改革委), Guojia nengyuan ju (国家能源局), December 2016, http://www.ndrc.gov.cn/zcfb/zcfbghwb/201612/P020161222570036010274.pdf.

384 *Ibidem*; Kezaisheng nengyuan fazhan "shisanwu" guihua, *op. cit.*

385 Qingjie nengyuan xiao na xingdong jihua (2018–2020 nian) (清洁能源消纳行动计划（2018–2020年)), Guojia fazhan he gaige weiyuanhui (国家发展和改革委员会), October 30 2018, http://www.ndrc.gov.cn/zcfb/gfxwj/201812/W020181204575699521824.pdf.

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Table 23. Renewable energy utilization rates (2018–2020)

	2018	2019	2020
Wind			
– Average wind energy utilization rate	>88 % (90 %)	>90 % (92 %)	approx. 95 %
– Losses	<12 % (10 %)	<10 % (8 %)	approx. 5 %
Sunshine			
– Average solar energy utilization rate	>95 %	>95 %	>95 %
– Losses	<5 %	<5 %	<5 %
Water			
– Average hydropower utilization rate	>95 %	>95 %	>95 %

Source: own work based on: Qingjie nengyuan xiao na xingdong jihua (2018–2020 nian) (清洁能源消纳行动计划（2018–2020年), Guojia fazhan he gaige weiyuanhui (国家发展和改革委员会), October 30, 2018, http://www.ndrc.gov.cn/zcfb/gfxwj/201812/W020181204575699521824.pdf

erators more time to increase their transmission capacity and reduce the losses that derived from generating clean electricity. According to National Energy Administration data, wind energy losses fell to 7 % in 2018–5 percentage points less than a year earlier. The regions in the northwest of the country with the highest wind potential, i. e. Xinjiang and Gansu, recorded energy transmission and distribution losses of 20 % on average.[386]

The solar energy sector experiences similar dynamics. In early 2018, regions such as Gansu, Xinjiang, and Tibet were banned from opening new solar power plants until existing projects had full access to the grid. The average loss rate in the solar energy sector fell to 2.4 % (2.61 billion kWh) in the first half of 2018. However, it was much higher in several regions: 25.7 % in Tibet, 10.6 % in Xinjiang, 6.9 % in Gansu, and 6.3 % in Qinghai.[387] In an attempt to address this, the Standing Committee of the National People's Congress of China decided to send inspection teams to carry out a comprehensive assessment of the implementation of renewable energy regulations at the local level. The following regions were selected for inspection: Xinjiang, Jilin, Gansu, Qinghai, Ningxia, and Hebei. The teams are to identify whether individual local authorities prioritize renewable energy, limit the scale of losses, and contribute to the profitability of the sector. The initiative, first and foremost, is about implementing regulations that oblige local companies that are hooked up to the grid to prioritize clean energy sources and maximize purchases from local renewable energy suppliers. Some regions have been criticized for wasting large amounts of potential re-

386 2018 nian kezaisheng nengyuan bing wang yun hang qingkuang jieshao, *op. cit.*

387 2019 nian shang bannian guangfu fadian jianshe yunxing qingkuang (2019年上半年光伏发电建设运行情况), Guojia nengyuan ju (国家能源局), August 23, 2019, http://www.nea.gov.cn/2019-08/23/c_138330885.htm.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

newable energy, technical problems in energy transmission, and continuing to opt for conventional energy sources such as coal or natural gas.[388]

On July 1, 2017, China launched a pilot program for tradable green certificates (绿色电力证书). This measure reflected the dwindling the cost of energy production from renewable sources, which reduced the existing national investment burden in this sector. On this basis, solar and wind energy producers were to receive tradable green certificates confirming that the electricity they generated was produced from renewable energy sources.[389] On March 23, 2018, the National Energy Commission presented a project on the required renewable energy portfolio (可再生能源电力配额及考核办法(征求意见稿)), which would form the basis for the renewable energy certificate market. The mechanism of the required renewable energy portfolio, known as the Renewable Portfolio Standard (可再生能源配额, RPS), is to foster the integration of renewable energy across the country through market mechanisms, promoting cleaner solutions with a significant reduction in the contribution of coal. The project proposed mandatory minimum purchases of renewable energy at the provincial level.[390]

In January 2019, the National Development and Reform Commission announced the implementation of pilot projects in wind and solar energy outside the feed-in tariff system. The prices for energy generated through these projects is the same as or lower than the costs of energy generated by coal-fired power plants. Although the plants involved in the project will not receive government subsidies, they may be exempted from participation in certain transactions on the energy market and sign long-term power purchase agreements with network operators at fixed tariffs. Within two years of the launch of the project, investments in solar and wind energy will be carried out on the basis of guaranteed tariffs and without guaranteed rates. The pilot projects will be implemented only in those regions where local authorities will be able to guarantee the full use of energy from these power plants and where their construction will not reduce demand compared to existing ones. Local authorities may set up special grant

388 *Quanguo renda changwei hui qidong ke zaisheng nengyuan fa zhifa jiancha* (全国人大常委会启动可再生能源法执法检查), Xinhua (新华), August 28, 2019, http://www.xinhuanet.com/politics/2019-08/28/c_1124932720.htm.

389 Guojia fazhan gaige wei caizheng bu guojia nengyuan ju guanyu shixing kezaisheng nengyuan lüse dianli zhengshu hefa ji ziyuan rengou jiaoyi zhidu de tongzhi (fa gai nengyuan [2017] 132 hao) (国家发展改革委财政部国家能源局关于试行可再生能源绿色电力证书核发及自愿认购交易制度的通知 (发改能源 [2017] 132号)), Guojia fazhan he gaige weiyuanhui (国家发展和改革委员会), Caizheng bu (财政部), Guojia nengyuan ju (国家能源局), January 18, 2017, http://www.ndrc.gov.cn/zcfb/zcfbtz/201702/t20170203_837117.html.

390 Guojia nengyuan ju zonghe si guanyu zhengqiu "kezaisheng nengyuan dianli pei'e ji kaohe banfa (zhengqiu yijian gao)" yijian de han (国家能源局综合司关于征求《可再生能源电力配额及考核办法（征求意见稿）》意见的函), Guojia nengyuan ju (国家能源局), March 23, 2018, http://zfxxgk.nea.gov.cn/auto87/201803/t20180323_3131.htm.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

rules for the pilot projects. China will also reduce the "unjustified" fees associated with these projects and reduce the cost of land for these investments. Financial institutions will be encouraged to support the construction of projects without guaranteed tariffs.[391] These solutions illustrate the desire to reduce overcapacity production from renewable energy, which resulted from a rapidly growing number of investments based on central subsidies. As early as 2018, the central authorities decided to introduce financial restrictions for solar power producers to slow down record growth and integrate the generated capacity into the grid.

The first group of unsubsidized investments approved for implementation includes projects with a total capacity of 20.76 GW. The plan provides for the implementation of 250 unsubsidized projects, including 168 industrial photovoltaic power plants with a potential of 14.78 GW, 56 wind farms with a capacity of 4.51 GW, and 26 projects with a capacity of 1.47 GW from the distributed energy category. Central and local authorities are to stop issuing permits for new installations based on feed-in tariffs, thus creating room for projects that do not benefit from this type of support. Network operators are to ensure that investors in non-subsidized projects have priority access to the network and receive contracts for at least 20 years at a guaranteed price.[392] The main challenge for the renewable energy sector continues to be difficulty in accessing the grid. The existing energy system is not yet adapted to the needs of the growing renewable energy industry.

391 Guojia fazhan gaige wei guojia nengyuan ju guanyu jiji tuijin fengdian, guangfu fadian wu butie pingjia shangwang youguan gongzuo de tongzhi (fa gai nengyuan [2019] 19 hao) (国家发展改革委国家能源局关于积极推进风电、光伏发电无补贴平价上网有关工作的通知 (发改能源 [2019] 19号)), Guojia fazhan he gaige weiyuanhui (国家发展和改革委员会), Guojia nengyuan ju (国家能源局), January 7, 2019, http://www.ndrc.gov.cn/gzdt/201901/t20190109_925400.html.

392 Guojia fazhan gaige wei bangongting guojia nengyuan ju zonghe si guanyu gongbu 2019 nian di yi pi fengdian, guangfu fadian pingjia shangwang xiangmu de tongzhi (fa gai ban nengyuan [2019] 594 hao) (国家发展改革委办公厅国家能源局综合司关于公布2019年第一批风电、光伏发电平价上网项目的通知 (发改办能源 [2019] 594号), Guojia fazhan he gaige weiyuanhui (国家发展和改革委员会), Guojia nengyuan ju (国家能源局), May 20, 2019, http://zfxxgk.nea.gov.cn/auto87/201905/t20190522_3664.htm; 2019 nian di yi pi fengdian, guangfu fadian pingjia shangwang xiangmu xinxi huizong biao (2019年第一批风电、 光伏发电平价上网项目信息汇总表), Guojia fazhan gaige wei bangongting (国家发展改革委办公厅), Guojia nengyuan ju zonghe si (国家能源局综合司), May 20, 2019, http://zfxxgk.ndrc.gov.cn/web/iteminfo.jsp?id=16183.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

4.1 Hydropower

Hydropower is the main source of energy from renewable sources. Although China's total theoretical hydropower potential is 694 GW, the total technically exploitable hydropower installed capacity is estimated at 542 GW.[393] The largest water resources in the country are concentrated in the western regions. Reserves located in 11 provinces, directly administered cities, and the autonomous regions of northern and southwestern China represent 78 % of the country's water potential (407 GW). Yunnan, Sichuan, and Tibet alone account for 57 % of this potential (295 GW).[394] Since the beginning of the new millennium, China has embarked on massive projects to build large and small hydroelectric power plants to stimulate industrial development and increase electricity supply to poor rural regions suffering from lack of access to the grid.

In 2018, the total installed capacity in the Chinese hydropower sector was 352 GW. Thus far, China has mainly invested in the development of large hydroelectric power plants, as can be gleaned from the list of 22 large hydroelectric power plants currently in operation with a capacity of more than 2 GW (Table 12). The largest project so far – the Three Gorges Dam on the Yangtze River, with a capacity of 22.5 GW – was launched in 2008. Other major projects include Xiluod, Xiangjiaba, Longtan, and Nuozhadu. One third of the generation capacity in the hydropower sector is generated by small hydroelectric power plants with a capacity of less than 50 MW. They play a particularly important role in rural areas and mountain regions.

However, the construction of hydroelectric power plants in southwestern China raises a number of questions and concerns about the plants' impact on local ecosystems and compensation for residents who had to leave their homes to accommodate projects in their local area. In recent years, concerns about such social and environmental costs have led China to become more cautious in authorizing new projects. The cost of building new hydroelectric power plants is often higher than the cost of building conventional ones. Another problem is choosing locations for the project that maximize the amount of energy generated. Distant locations generate large losses in energy transmission and distribution.[395] These problems were confirmed by audit results announced in June 2018. Nine

393 Wang Weiguang / Zheng Guoguang / Pan Jiahua (ed.), *Chinese Research Perspectives on the Environment.* Annual Report on Actions to Address Climate Change (2012), vol. 4, BRILL 2014, p. 176.

394 Yi-Ming Wei / Hua Liao, *Energy Economics: Understanding and Interpreting Energy Poverty in China*, Emerald Publishing Limited 2019, p. 207.

395 Łukasz Gacek, *Zielona energia w Chinach: Zrównoważony rozwój – Ochrona środowiska – Gospodarka niskoemisyjna*, Wydawnictwo Uniwersytetu Jagiellońskiego, Kraków 2015, p. 204.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

Table 24. Largest hydroelectric power plants in China

Dam	River	Installed capacity (MW)	Year of completion
Three Gorges Dam	Yangtze	22,500	2008
Xiluodu	Jinsha	13,860	2014
Xiangjiaba	Jinsha	6,448	2014
Longtan Dam	Hongshui	6,426	2007/2009
Nuozhadu	Mekong	5,850	2014
Jinping-II	Yalong	4,800	2014
Laxiwa Dam	Yellow	4,200	2010
Xiaowan Dam	Mekong	4,200	2010
Jinping-I	Yalong	3,600	2014
Ertan Dam	Yalong	3,300	1999
Pubugou Dam	Dadu	3,300	2009/2010
Goupitan Dam	Wu	3,000	2009/2011
Guanyinyan Dam	Jinsha	3,000	2014/2016
Gezhouba Dam	Yangtze	2,715	1988
Changheba	Dadu	2,600	2016/2017
Dagangshan	Dadu	2,600	2015/2016
Jinanqiao Dam	Jinsha	2,400	2010
Liyuan Dam	Jinsha	2,400	2014/2015
Guandi Dam	Yalong	2,400	2013
Ludila	Jinsha	2,160	2014
Lijiaxia Dam	Yellow	2,000	1997/2000
Ahai Dam	Jinsha	2,000	2014

Source: Ferdinand Bada, *The Largest Hydroelectric Power Stations in China*, July 12, 2018, https://www.worldatlas.com/articles/the-largest-hydroelectric-power-stations-in-china.html

provinces (Yunnan, Sichuan, Guizhou, Hubei, Hunan, Jiangxi, Anhui, Jiangsu, and Zhejiang) and two directly administered cities (Chongqing and Shanghai) along the Yangtze River and its tributaries were calculated to have at least 24,100 small hydropower plants in operation, many of which generated serious environmental damage. The audit signaled that a number of projects were carried out with no prior environmental impact assessment, which is required in cases like this. The authors gave small dams were given as an example of projects that led to the degradation of habitats and reproductive environments of many rare species of fish.[396]

396 *2018 nian di 3 hao gongbao: Changjiang jingji dai shengtai huanjing baohu shenji jieguo* (2018年第3号公告：长江经济带生态环境保护审计结果), Shenji shu (审计署), June 19, 2018, http://www.audit.gov.cn/n5/n25/c123511/content.html.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

4.2 Wind energy

China is the world's largest producer of wind power and has the largest installed wind in the world. It is estimated that China has an onshore installation potential of 2,380 GW for Class 3 (average wind power>300 W/m^2), 1,130 GW for Class 4 (average wind power>400 W/m^2), and 200GW offshore (at a depth of 5–25 m).[397] The country's vast territory provides a natural incentive and opportunity for the development of onshore installations. The long southeastern coastline, which stretches through the provinces and autonomous regions of Shandong, Jiangsu, Zhejiang, Fujian, Guangdong, Guangxi, and Hainan Island, offers great potential for offshore wind energy development. The 13th Five-Year Plan (2016–2020) highlights the government's direction of development for offshore wind and ocean energy.[398]

The total installed capacity of the onshore and offshore wind power plants connected to the grid in China has clearly increased over the last decade, reaching 184 GW at the end of 2018. This represented more than one third of the total installed wind power capacity in the world. Such rapid growth was a consequence of the development of the national production base and favorable government policies. In June 2008, China produced the first wind generator based on its own technological solutions at Harbin, with a capacity of 1.5 MW.[399] In 2018, more than half of the world's 15 largest wind turbine manufacturers were based in China. The list, published by the Global Wind Energy Council (GWEC), includes companies such as Goldwind (with 13 % of the global market share, second only to the Danish manufacturer Vestas), Envision, Mingyang, United Power, Sewind, Windley, CSIC Haizhuang, and XEMC. Together, these eight companies controlled more than 38 % of the global turbine market.[400]

4.3 Solar energy

China is a world leader in the production and distribution of photovoltaic cells. Despite recent progress in reducing overcapacity, the International Energy Agency (IEA) predicts that China will maintain almost 40 % of the world's

397 Zhang Xiliang / Zhang Da / Michele Stua, *Kickoff of Offshore Wind Power in China: Playoffs for China Wind Power Development*, "Procedia Environmental Sciences", 12 (2012), p. 168.

398 Kezaisheng nengyuan fazhan "shisanwu" guihua, *op. cit.*

399 Gao Xinyu / Jin Bo / Li Bin / Yang Kai / Zhang Hongguang / Fan Boyuan, *Study on Renewable Energy Development and Policy in China*, "Energy Procedia", 5 (2011), p. 1285.

400 *GWEC: 1 in 5 wind turbines installed by Vestas in 2018, according to new market intelligence report*, Global Wind Energy Council (GWEC), April 19, 2019, https://gwec.net/gwec:-1-in-5-wind-turbines-are-installed-by-vestas,-according-to-new-market-intelligence-report/.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

installed photovoltaic capacity in 2023.[401] At the end of 2018, the potential of PV power plants in China rose to 174 GW, significantly exceeding the targets set under the 13th Five-Year Plan (2016–2020).China became the largest photovoltaic market in the world in 2015, surpassing the previous leader – Germany. In 2018, five of the top ten solar panel manufacturers (Jinko Solar, JA Solar, Trina Solar, LONGi Solar, Risen Energy, and Telesun) were based in China, while one (GCL-SI) was headquartered in Hong Kong. The largest producer was Jinko Solar, which sold 11.4 GW of photovoltaic cells, generating revenues of 3.64 billion USD. At the end of the year, the company had production lines for silicon wafers, cells, and modules with a total capacity of 9.7 GW, 7 GW, and 10.8 GW, respectively. Plans for the following year already provided for a significant increase in production capacity – 15 GW for silicon wafers (of which monocrystalline wafers comprised 11 GW), 10 GW for cells (of PERC technology comprised 9.2 GW), and 15 GW for photovoltaic modules.[402]

The largest photovoltaic capacity in China is concentrated in the northwestern regions of the country, i. e. Shaanxi, Gansu, Qinghai, Ningxia, and Xinjiang. Unfortunately, those regions are also where problems related to inefficiency and wasted energy potential are most acute. This is because the construction of solar installations was not coordinated with that of power transmission networks. As a result, the grid still has limited capacity to transmit additional energy from renewable sources. It is also worth mentioning that solar farms do not necessarily have to be located on land, as evidenced by ideas implemented in China. One of the latest investments is a 40 MW floating photovoltaic power plant in Huainan.[403] These installations use water as a coolant, which reduces investment costs.

China is also planning to build an orbital solar power plant, located at an altitude of 36,000 km, to generate clean solar energy without interruption. Such a power plant could be an inexhaustible source of energy and provide power to the Earth continuously for 99 % of the time. It would be six times more efficient than current solar power generation from panels on the Earth's surface. The prototypes for the technological infrastructure necessary to bring this project to fruition are being constructed in the city of Chongqing. Between 2021 and 2025, China plans to send prototype solar power plant into the stratosphere for testing. The space-based solar farm is to be put into orbit by 2030. In principle, the energy

401 *Renewables 2018. Analysis and Forecasts to 2023*, *op. cit.*

402 Mark Hutchins, *Jinko Solar Shipped 11.4 GW of Modules in 2018*, "PV Magazine", March 22, 2019, https://www.pv-magazine.com/2019/03/22/jinkosolar-shipped-11-4-gw-of-modules-in-2018/.

403 *Quanqiu zuida shuishang piaofu guangfu dianzhan 40 zhao wa dianli bing wang* (全球最大水上漂浮光伏电站40兆瓦电力并网), Dianlan wang (电缆网), May 19, 2017, http://news.cableabc.com/gc/20170519859687.html.

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captured from this orbital plant will be available for commercial use around 2050.[404]

4.4 Biomass

China is actively promoting the policy of increasing the share of biomass in energy production in order to reduce carbon consumption and improve air quality. Biomass consists of plant and animal material that is a natural source of energy. China's biomass resources mainly consist of waste from agriculture, forestry, industry, manure and animal waste, and municipal solid waste. The target released in 2016 was to achieve a volume of energy production from biomass equivalent to 58 million tons of coal per year by 2020. It is worth mentioning that, on an annual basis, China produces an amount of biomass that, if used for energy production, would correspond to 460 million tons of coal. Nevertheless, most of it is not usable due to lack of sufficiently effective technology.[405]

Technological deficiencies are the biggest problem in this sector. Most implemented projects are small-scale. This creates a number of challenges for suppliers and users. Common practices related to the transfer of specific technological solutions often do not sufficiently take into account the local conditions in which the technology would be applied. A good example is biogas plants that use raw plant and animal materials as well as waste from agricultural food processing to produce biogas. Small and dispersed energy sources are designed to meet the energy needs of farms, plants and local environments. Biogas can be used for cooking, heating, and, to a lesser extent, electricity production. However, in this case, improving the efficiency of biogas remains a major challenge. Most of the existing systems do not produce biogas in amounts that come anywhere close to their potential. Lack of technological expertise, low productivity, and poor management are three additional problems. China must therefore first focus on research to improve the efficiency of biogas and enhance relevant technical and technological knowledge.

404 *Woguo youwang shuaixian jiancheng kongjian taiyangneng dianzhan* (我国有望率先建成空间太阳能电站), "Keji Ribao" (科技日报), February 14, 2019, http://www.stdaily.com/kjrb/kjrbbm/2019-02/14/content_749961.shtml.

405 Guojia nengyuan ju guanyu yinfa "sheng wuzhi neng fazhan "shisanwu" guihua" de tongzhi (guo neng xin neng [2016] 291 hao) (国家能源局关于印发《生物质能发展"十三五"规划》的通知 (国能新能 [2016] 291号)), Nengyuan ju wangzhan (能源局网站), October 28, 2016, http://www.gov.cn/xinwen/2016-12/06/content_5143612.htm.

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4.5 Geothermal energy

Geothermal energy is the natural wealth of China. The country's geothermal reserves account for about one sixth of the global total. Geothermal energy can therefore successfully fill the energy gap in China's southwestern regions. The energy accumulated in water and geothermal vapors is used in heating, balneotherapy, and recreation as well as agricultural production. On a local level, it can also be used to produce electricity. China has been pursuing ambitious plans to tap into the potential of geothermal energy for years. They stress that they not only have rich geothermal resources, but also enormous market potential and development perspectives. The use of geothermal energy is becoming increasingly important in light of the ongoing changes in the energy structure as well as China's ambitions to increase energy efficiency and reduce environmental pollution. It also influences the development of new industries and the process of urbanization, especially in the context of eco-friendly construction. The largest high-temperature resources are concentrated in the Himalayan Geothermal Belt, low- and medium-temperature conductive resources are dominant in the central and eastern regions, and low- and medium-temperature convective resources are primarily present in the southwest.

The 13th Five-Year Plan (2016–2020) provides for an increase in the area serviced by geothermal heating to 1.6 billion m² and an increase in installed geothermal power generation capacity to about 530 MW. In addition, the Plan sets a target for the annual utilization volume of geothermal energy (70 million tons of coal equivalent) the annual utilization volume of geothermal heating (40 million tons of coal equivalent). The annual use of geothermal energy in the Beijing-Tianjin-Hebei region should in turn reach about 20 million tons of standard coal, according to the Plan.[406] This last point corresponds to a separate plan, presented in December 2017, to switch to clean heating in northern China within five years. This last plan contained guidelines for heating based on geothermal energy, biomass, industrial waste, electricity, and natural gas.

On the domestic market, the state-owned company Sinopec plays an active role in developing and using geothermal energy. One pertinent proposal is a project put forward by Sinopec Star Petroleum Ltd (中石化新星石油公司), a subsidiary of Sinopec responsible for the development and use of conventional geothermal resources, to create twenty 'smokeless cities' (无烟城) in the course of the 13th Five-Year Plan (2016–2020), replacing coal with geothermal energy in

406 Direneng kaifa liyong "shisanwu" guihua (地热能开发利用"十三五"规划), Guojia fazhan he gaige weiyuanhui (国家发展和改革委员会), Guojia nengyuan ju (国家能源局), 国土资源部, January 2017, http://www.ndrc.gov.cn/fzgggz/fzgh/ghwb/gjjgh/201706/W020170605632011127895.pdf.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

an area that totals 100 million m².[407] Given that geothermal projects have high implementation costs, China is targeting its activities in areas with the greatest geothermal potential. In order to maximize profits, major geothermal development projects in the near future will be concentrated in Tibet and the provinces of Yunnan and Sichuan.

5. Development trajectories for electrical power networks

Despite a strongly centralized planning regime for the creation of electric grid infrastructure, energy trade between regions remains severely restricted. To remedy this, in the early 2000s, China began to develop the West-East Electricity Transmission Project. The project involved the transmission of energy from the western regions towards the east coast, including the provinces of Guangdong, Fujian, Jiangsu, and Zhejiang, as well as cities such as Shanghai, Beijing, Tianjin, and others that suffered from an electricity deficit. Seven projects covering the provinces of Yunnan, Guizhou, and Hubei, the Guangxi Autonomous Region, and the city of Chongqing were intended to form a southern corridor for the transmission of electricity to the grid in southern China. The northern route was to transmit energy through the autonomous region of Inner Mongolia and the province of Shaanxi to northern China, while a third planned route led from the province of Sichuan to central and eastern China.[408]

Since 2009, China has been developing projects for ultrahigh voltage (UHV) transmission networks for long-distance AC and DC transmission. UHV networks significantly reduce transmission losses. The construction of China's UHV network, with three main north-south and three west-east corridors, was initiated under the 12th Five-Year Plan (2011–2015). The government is currently planning to extend the network, including to areas in the north and west of the country. In 2009, the State Grid Corporation reported that, by 2020, China would invest 600 billion RMB (approximately 84 billion USD) in the development of the UHV network. Transmission losses are to be reduced to 5.7 % compared to 6.6 % in 2010.[409] The UHV network development plan was designed to integrate regional networks as well as coal and hydropower bases with the main load centers. The decision to switch to UHV transmission stemmed from the fact that the main

407 *Zhongguo zuida de di dire kaifa qiye yuanlai shi Zhongshihua ta yao zao 20 zua "wuyan cheng"* (中国最大的地热开发企业原来是中石化它要造20座"无烟城", Jiemian xinwen (界面新闻), November 15, 2016, https://www.jiemian.com/article/958053.html.

408 *Construction of West-East Electricity Transmission Project Starts*, "People's Daily", November 9, 2000, http://en.people.cn/english/200011/08/eng20001108_54682.html.

409 *China Energy Policy, Laws and Regulation Handbook*, vol. 1, *Strategic Information and Basic Laws*, International Business Publications, Washington 2015, p. 248.

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energy sources are located far from the largest centers of demand. That is, about 80 % of the country's hydropower potential is located in southwestern China, while 75 % of the coal reserves are located in the north-west. Conversely, the most populated areas of the eastern coast of China account for 70 % of the country's electricity consumption.

By 2016, China had launched eight UHV lines with a total length of 11,900 km. The government plans to launch another 16 by 2020. However, less than half of them will be transmitting electricity from renewable sources. The existing lines are concentrated in regions such as Gansu, Inner Mongolia, and Xinjiang.[410] The development of UHV technology favors the construction of new, cleaner, and more efficient power plants that are far removed from large agglomerations. This allows for the relocation of many power plants from populated areas near Beijing, Shanghai, and Guangdong into the countryside, as UHV lines can transmit energy over much longer distances than conventional power lines.[411] Another advantage of UHV solutions is that they more fully tap into the potential of renewable energy sources. Given that renewable energy is produced on an intermittent basis, combining such intermittent sources of energy can compensate for fluctuations in energy production.

6. Development prospects for renewable energy sources in China

The development of the renewable energy sector is largely linked to the threat of global warming resulting from the emission of harmful substances via the combustion of fossil fuels into the atmosphere. Energy policy aimed at the development of RES in the coming years will depend on central authorities' determination to implement ambitious environmental plans at the national and regional levels as well as general macroeconomic trends, both in China and worldwide. Activities in this area will also closely correlate with plans to modify the national energy structure, which has thus far been based mainly on coal. Given that this sector still has a limited base, it will take time to move away from fossil fuels. In the future, renewable energy sources will remedy the expected gap between supply and demand for energy, including from fossil fuels. Fossil fuels will maintain a dominant position in the energy mix for the foreseeable future,

410 Zhou Yiyi / Sophie Lu, *China's Renewables Curtailment and Coal Assets Risk Map*, Bloomberg NEF, October 25, 2017, p. 11, https://data.bloomberglp.com/bnef/sites/14/2017/10/Chinas-Renewable-Curtailment-and-Coal-Assets-Risk-Map-FINAL_2.pdf.

411 Stephen Chen, *China to Build New Hi-tech Power Network to Help Fight Pollution*, "South China Morning Post", May 14, 2014, https://www.scmp.com/news/china/article/1512282/china-build-new-hi-tech-power-network-help-fight-pollution.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

but renewable energy will account for a growing share of supply and gradually begin to address the growth of domestic energy demand.

China's growing urbanization will contribute to this increase. By 2030, the population of the country's cities will have increased to about 60 % of the total. This means that another 300 million people will move to urbanized areas during this time. The continuous upward trend in energy demand can be significantly reduced if China continues to tighten and strictly enforce energy efficiency standards for buildings, lighting, and appliances – especially in heating, ventilation, and cooling. Energy consumption in the transport sector will certainly increase in the coming decade as well. However, China has presented ambitious programs for the development of electric vehicles and high-speed rail, which should improve energy efficiency and reduce consumption.

On the other hand, one should not forget that China still has a large number of energy-intensive companies that benefit from various forms of support from local authorities. It is commonly known that these businesses do not give due importance to energy conservation or increasing production efficiency. Many Chinese companies in their early stages of development focus more on scaling up and increasing their market share than on energy conservation. Another problem is the low level of expertise among local authorities on energy conservation. Many of them are driven by a desire for short-term economic benefits rather than the need to protect resources.

Another issue is that the renewable energy market remains dependent on state subsidies. Solar and wind energy are still not competitively priced against coal and other fossil fuels. The feed-in tariff system has so far stimulated an increase in Chinese investment in the renewable energy sector. However, in recent years, distributors at the provincial level have often prioritized coal, which has been cheaper than wind and solar energy. Renewables do not guarantee permanent and continuous access to energy for end users. Therefore, a constant supply of energy using fossil fuels was maintained during the winter months. Thus, the challenge is to adapt policies to specific situations that arise from varying levels of resources being available at any given time, as well as differing technical and administrative capacity in individual regions.

The advantage of applying tariffs to renewable energy sources is that they improve the competitiveness of such resources in the eyes of investors in the short run. Conversely, a subsidy-based approach, whereby subsidies only stimulate growth in the amount of energy produced, has led many companies to be guided by current profits, without reflecting on the long-term interests of the whole industry. Grants should be shifted up the industrial value chain to support innovative technologies such as the storage of electricity generated from renewable sources. As China's renewable energy sector is moving to a higher level of development, the country's subsidy policy should be more flexible and market-

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

oriented. Grants should stimulate the development of innovative solutions in this area, taking into account the small share of production that uses highly advanced RES technology. The cost of generating energy from renewable sources in China is steadily decreasing, as can be seen from the fact that the prices of wind power and photovoltaic cell shave fallen by around 20 % and 60 %, respectively, during the 12th Five-Year Plan (2011–2015).[412]

The number of patents and patent applications is widely regarded as one of the determinants of innovation. Around 170,000 patents in the field of renewable energy were registered in China in 2016. This represented 29 % of all patents in the world. The U.S. had just over 100,000 patents (18 %), while Japan and the EU each had 75,000 (14 %).[413] Although the number of patents and patent applications forms the basis for assessing a country's level of innovation, the quality of these patents is a critical distinguishing variable. The most valuable patents are those that set standards for the development of specific industries. The type of solutions proposed and the scale of possible commercialization are therefore important. With this in mind, one can readily observe that China has focused more on increasing the number of patents than on their quality in recent years. Another problem has been that few solutions from the scientific sector enter the industry. This was due to the low efficiency of cooperation between industry and the scientific community. Notably, there is often no link between the results proposed by scientific centers and the needs of the market, i. e. solving specific problems that pervade the industry. China also registers utility-model patents, whose bar for innovation is much lower than in many other countries. Companies with a large number of patents have benefited from tax relief to encourage them to increase their R&D spending. This meant that the quantity of patents has not always translated into the quality of the technologies developed.

Today, China is becoming one of the largest exporters of low-carbon technologies. According to estimates by Boston University, China's exports of energy and energy equipment reached a value of 476 billion USD between 2000 and 2013. One important item contributing factor was the sale of equipment in sectors related to renewable energy. In 2013, exports of equipment in the solar energy (PV) sector amounted to 173.7 billion USD (44 % of the world market share), 2.7 billion USD (17 %)in the hydropower sector, and 8.8 billion USD (6 %) in the wind energy sector.[414] According to COMTRADE data, China's exports of Re-

412 Kezaisheng nengyuan fazhan "shisanwu" guihua, *op. cit.*

413 *A New World. The Geopolitics of the Energy Transformation*, International Renewable Energy Agency (IRENA), 2019, p. 27, 41, http://geopoliticsofrenewables.org/assets/geopolitics/Reports/wp-content/uploads/2019/01/Global_commission_renewable_energy_2019.pdf.

414 Bo Kong / Kevin P. Gallagher, *The Globalization of Chinese Energy Companies: The Role of State Finance*, Boston University's Global Economic Governance Initiative (GEGI), 2016, p. 3, https://www.bu.edu/pardeeschool/files/2016/06/Globalization.Final_.pdf.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

newable Energy Products attained a value of 83.40 USD billion in 2016, representing 24.31 % of the global exports of this commodity group. The characteristics of the export structure show that China has mainly been focused on supplying medium-high and medium technical complexity products. The technical level of exported products placed it in the middle of the global industrial value chain. China also had to face increasing competition in the market, given the dynamic growth rates of renewable energy technology in South Korea, Japan, and Malaysia, all of which are much higher than in China. Despite China's strong export performance in 2016, the lack of highly advanced technologies was still a problem. High-Tech products constituted 4.58 % of the technological structure of its exports, while Medium-High-Tech products comprised 50.28 %, Medium-Tech products comprised 25.29 %, Medium-Low-Tech products comprised 16.01 %, and Low-Tech products made up 3.84 %. Unsustainable government subsidy policies and an unpredictable international trading environment exacerbated the existing problems.[415]

China continues to face problems in the distribution of renewable energy and to struggle with insufficient network access. Most renewable energy sources are concentrated in Western China, in regions such as Gansu, Xinjiang, and Tibet, where the market's capacity to absorb RES is limited. The example of Inner Mongolia, the largest wind power base in China, provides evidence of energy wastage due to limited transmission capacity. The reduction of the country's CO_2 emissions will therefore be largely due to the smooth transfer of energy produced in these remote regions to the main industrial centers on the east coast of China. The key will be to remove barriers to trade in energy between the provinces while prioritizing renewable energy sources in energy transmission. Thus, a forward-looking solution is the development of microgrids, which can integrate RES and use energy storage systems. Installed at or near the point of use, they are highly efficient, ensuring a stable and continuous supply of electricity. The development of the microgrids can be implemented in conjunction with the application of innovative solutions (e. g., the Internet+ initiative) that are conducive to conserving energy and reducing emissions.

Distributed energy (分布式能源) based on renewable energy sources can be very effective and help to strengthen China's energy security. China could install far more new solar power capacity per year if this initiative were more widely addressed to individual households. However, these are dreams of a rather rosy future given that China set a rather modest limit of 3 GW for solar installations in households for 2019. Calculated at the level of 5 kW per household equals, the

415 Cao Xuping / Aroskar Rajarshi / Tong Juxi, *Technology Evolution of China's Export of Renewable Energy Products*, "International Journal of Environmental Research and Public Health", 15(8) (2018), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6121901/.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

indicator yields "only" 600,000 installations, falling to 375,000 installations when calculated at the level of 8 kW per household.[416]

The success of the renewable energy sector will be determined by the involvement of the authorities in Beijing in R&D and educational projects in the sector. China must assign importance not only to increasing the scale of the market, but also to the quality of the entire sector. At an early stage, RES could count on preferential treatment and subsidies. As the rate of RES development has accelerated significantly in recent years, many actors in this sector have been expanding blindly, focusing only on increasing the scale of new investments without paying much attention to quality. The implementation of innovative solutions depends on human capital. The current number of professionals does not meet the demand from industry. Therefore, there is a need to create a mechanism for training professionals in different fields, based on market needs. Among others, this includes energy auditors, who provide assistance to people and institutions interested in energy efficiency and conservation. In addition, there is a strong need for financial analysts, qualified technical staff, R&D and innovation staff, and strategic decision-makers. Such training programs should be supplemented by a stronger feedback loop between the industry and academic education.

The predicted development of the green energy sector in China is critical to the global fight against climate change, given that the country is the world's largest emitter of greenhouse gases. Slowing down the development of renewable energy while increasing the use of fossil fuels may raise concerns that emissions in China will not stabilize over the next decade – an objective agreed to at the Paris Climate Change Conference. Although China is the largest clean energy market in the world, wind and solar power account for only a few percent of domestic energy production. It will be difficult for China to put the fight against climate change on its agenda of priorities in the face of other challenges resulting from intensified trade competition with the United States and a slowdown in economic development. Coal consumption and production peaked in 2013, but began growing again in 2017, gradually returning to levels from several years ago. Recently, China has increased funding for projects related to the development of unconventional gas sources, which has resulted in reduced subsidies for wind and solar projects. In its reform of the feed-in tariff system, the government decided to introduce an auction system where wind and solar power must compete directly with fossil fuels.

416 *2019 nian hu yong guangfu zhibiao guimo 3GW jiang you 37.5 wan hu anzhuang* (2019年户用光伏指标规模3GW 将有37.5万户安装), EnergyTrend, December 21, 2018, https://energy.cngold.org/c/2018-12-21/c6142217.html.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

The guidelines of the 13th Five-Year Plan (2016–2020) clearly defined China's direction of movement, signaling the need to build a clean, low-carbon, safe, and efficient energy system. They highlighted issues related to improving energy security and transformations in the energy mix, environmental protection, combating climate change, and promoting sustainable development. The central government is aware that green energy is the greatest market opportunity of the 21stcentury. China's leadership in clean energy could lead to changes in the structure of the global energy system.

The Belt and Road Initiative (BRI), proposed by China in 2013, creates enormous space for expansion abroad for domestic companies in the clean and renewable energy sector. This new approach was revealed at the first Belt and Road Forum in 2017, when President Xi Jinping called for an "international coalition for green development on the Belt and Road" ("一带一路"绿色发展国际联盟, *"yidai yilu" lüse fazhan guoji lianmeng*).[417] At the next Forum in 2019, he spoke about promoting green growth within the Belt and Road Initiative, making assurances that China would launch green infrastructure projects, make green investments, and provide green funding to protect the Earth.[418]

The guidelines set out to achieve this are intended to encourage Chinese companies operating abroad to comply with local environmental legislation and call on them to adopt higher environmental standards. They are also a harbinger of a new political framework with the authority and power to neutralize environmental risks that may occur during the implementation of investment projects. The guidelines also include a proposal to use green funds in the implementation of ecological projects. At the same time, it should be noted that this mechanism has not established binding environmental standards for companies and banks operating abroad. Similarly, it has not defined its own means of enforcement or the potential penalties that may be imposed on companies that do not comply with environmental standards. Moreover, the guidelines do not identify the long-term challenges of climate change that stem from the Belt and Road Initiative.

In November 2018, the Chinese government's Special Representative on Climate Change, Xie Zhenhua, underscored that all projects under the Belt and Road Initiative should be green and low-carbon. He also noted that the implementation of individual projects would prioritize the use of the most advanced technologies, which would help save resources and energy and reduce

417 *Xi Jinping zai "yadai yilu" guoji hezuo gaofeng luntan kaimu shi shang de yanjing* (习近平在"一带一路"国际合作高峰论坛开幕式上的演讲), Xinhua (新华), May 14, 2017, http://www.xinhuanet.com//2017-05/14/c_1120969677.htm.

418 *Xi Jinping zai di er jie "yadai yilu" guoji hezuo gaofeng luntan kaimu shi shang de zhuzhi yanjiang* (习近平在第二届"一带一路"国际合作高峰论坛开幕式上的主旨演讲), Xinhua (新华), April 26, 2019, http://www.xinhuanet.com/silkroad/2019-04/26/c_1124420187.htm.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

harmful emissions.[419] However, such statements did not coalesce into concrete proposals on how China intends to achieve this goal. Rather, they were an attempt to justify the increasingly frequent accusations leveled against Chinese companies investing in the energy sectors of BRI countries, which were often seen to favor coal-based solutions. This is exemplified in the forum devoted to the construction of the Green Belt and Road (绿色一带一路, *lüse yidai yilu*), organized by the Ministry of Ecology and Environment and the National Development and Reform Commission on April 25, 2019, on the sidelines of the second Belt and Road Forum. Forum participants indicated that the construction of the 'Green Belt and Road' would be adapted to the UN's Sustainable Development Goals.

According to estimates by the Institute for Energy Economics and Financial Analysis, China is financing the construction of coal-fired power plants outside its borders with a total capacity of 102 GW. This represents 26 % of all coal investments outside China (399 GW). The largest financial support from China in this area can be found in Bangladesh, Vietnam, South Africa, Pakistan, and Indonesia. Approximately 76 GW of the expected 102 GW is in pre-construction status. Of these 76 GW of capacity, more than 60 GW have thus far failed to obtain the necessary permits to start construction. As a result, some of them may ultimately be canceled. The lenders are state-owned banks, i. e. China Development Bank, China Export-Import Bank, Bank of China (BOC), and China and Industrial Bank of China (ICBC). The parties involved in carrying out the projects are mostly large state-owned enterprises, including the State Grid Corporation of China, China Energy Engineering Corporation, State Power Investment Corporation, and China Huadian Corporation.[420]

The report *Decarbonizing the Belt and Road: A Green Finance Roadmap*, prepared jointly by Tsinghua University's Center for Finance and Development, Vivid Economics, and the Climate Works Foundation, strikes a similar tone. It predicts that, by the middle of this century, developing countries will emit more CO_2 than developed countries. The authors of the report stress that Chinese investments will accelerate this process in the countries associated with the Belt and Road Initiative by promoting solutions based on coal combustion. By 2050, the annual emissions of the BRI countries covered in the report will significantly

419 *Xinwen ban fabuhui jieshao "Zhongguo yingdui qihou bianhua de zhengce yu xingdong 2018 niandu baogao"* (新闻办发布会介绍《中国应对气候变化的政策与行动2018年度报告》, Zhongguo wang (中国网), November 26, 2018, http://www.gov.cn/xinwen/2018-11/26/content_5343360.htm.

420 Christine Shearer / Melissa Brown / Tim Buckley, *China at a Crossroads: Continued Support for Coal Power Erodes Country's Clean Energy Leadership*, Institute for Energy Economics and Financial Analysis, January 2019, http://ieefa.org/wp-content/uploads/2019/01/China-at-a-Crossroads_January-2019.pdf.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

exceed the objectives of the Paris Climate Agreement. In the coming decades, it is expected that the BRI countries will contribute significantly to global CO_2 emissions. The key 17 countries covered by the initiative could generate as much as 44 % of global emissions in 2050, up from 14 % in 2015.[421] For the 126 countries that have joined the BRI, emissions are projected to increase from 28 % in 2015 to 66 % in 2050.

Most of the countries that are engaged in the BRI are at an early stage of development, which means that their economic growth entails rising energy demand. This has an impact on carbon dioxide emissions. In the 17 countries mentioned above, Chinese investments will increase the annual GDP by 0.24 %, on average, by 2030. This is a relatively minor increase, but it will stimulate energy demand – especially in developing countries, where the level of planned investments is high. Investments related to the construction of electricity and transport infrastructure are inherently long-term projects with high carbon emissions. This leads to the question of how China intends to expand its own green requirements for BRI investments.[422] The nature of the planned investments in the countries covered by the initiative means that achieving the objective of limiting global warming to less than 2 °C will require the development of a broad decarbonization plan at a scale never seen before in world history.

The sharp increase in demand for electricity in South and Southeast Asia has automatically increased interest in these markets among Chinese energy companies. In recent years, these companies have been particularly keen to invest in the development of coal-fired power production. The dynamics associated with the construction of power plants have caused some countries to face the problems of overcapacity, market uncertainty, and a decrease in the profitability of energy obtained from coal. A good example is Bangladesh, which suspended all permits for the construction of new power plants in May 2019 because the facilities already under construction will meet the country's electricity demand by 2030. According to Greenpeace data, 98 % of Chinese energy projects in Bangladesh concern capital investments. Investments in shares give Chinese entities a voice in the management of the factory and a share in long-term profits, but also spread risk over time. The example of Bangladesh shows that Chinese investors, when undertaking coal projects abroad, should take into account the long-term risk of overcapacity. They should also properly assess future demand

421 Saudi Arabia, Bangladesh, Egypt, the Philippines, Indonesia, Iran, Kazakhstan, Malaysia, Myanmar, Mongolia, Pakistan, Russia, Singapore, Sri Lanka, Thailand, Ukraine, and Vietnam.

422 *Decarbonizing the Belt and Road: A Green Finance Roadmap*, Tsinghua University Center for Finance and Development, Vivid Economics, Climate Works Foundation, September 2019, https://www.climateworks.org/wp-content/uploads/2019/09/Decarbonizing-the-Belt-and-Road_report_final_lo-res.pdf.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

while considering development plans for the energy sector and political stability. Other parties involved in the investment process, such as banks and insurance companies, should carry out risk assessment more effectively.[423]

The proposals made at the First and Second Belt and Road Forum were intended to highlight China's commitment to environmental protection. However, the reality is that no specific solutions have been defined that would gradually reduce funding for carbon-intensive projects. Since its announcement in 2013, the Belt and Road Initiative has given priority to energy projects. Today, many of the countries covered by the initiative are facing serious energy shortages, which require major investments in this sector in the coming years. China's investment plans assumed the construction of coal-fired power plants and the development of coal technologies. Meanwhile, the share of coal in such electricity production is slowly declining worldwide. However, coal remains the main source of electricity and the second largest source of primary energy in the world. Increasing use of coal is particularly evident in many Asian countries.

Chinese developers have so far given priority to energy investments that prevent global warming from being reduced to safe levels. They enjoy financial support from banks, specifically China Development Bank and the Export Import Bank of China. Most coal-fired power plants built outside China are relatively inefficient. The government in Beijing is indirectly responsible for this state of affairs, which supports developers carrying out coal projects abroad. Clean energy projects have enjoyed less support. Moreover, most of the latter were related to hydropower, rather than wind and solar power, which should be taken into account in the context of assessing possible impacts on local ecosystems. The implementation of projects under the BRI carries the risk of more energy in the world being derived from coal than from clean energy. Thus far, China has been guided by its own interests in eliminating part of the overcapacity of its coal sector companies. At the same time, they 'exported' surplus capacity to other countries, which allowed them not only to keep existing coal producers on the market, but above all to prevent the loss of several million jobs.

BRI should be seen as part of a global competition between China and other powers. Financing development and infrastructure projects can bring Beijing not only economic, but above all strategic benefits at the expense of others. This is confirmed by China's activities in Southeast Asia, where the country is involved in almost all power generation projects. China aspires to be a standard setter in environmental protection and clean energy development. The question remains open as to whether the European Union and the United States, together with

423 Li Danqing / Wang Yan, *Bangladesh may suspend new power plant approvals*, China dialogue (Zhongwai duihua 中外对话), September 11, 2019, https://www.chinadialogue.net/article/show/single/en/11512-Bangladesh-may-suspend-new-power-plant-approvals.

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Australia and Japan, are able to create a viable alternative to promote high-quality infrastructure solutions in the energy sector. The sustainable development approach in the energy sector and the focus on renewable energy sources stems from the negative consequences of climate change and the environmental challenges facing China today. In the face of these problems, the pursuit of energy security requires shrinking the scale and impact of coal mining and the reduction of emissions of carbon dioxide, nitrogen and sulfur oxides, and other gases that are not only responsible for the greenhouse effect, but also pose serious risks to human health and life.

The predominance of energy demand over energy supply, which has been observed in China since the beginning of the new millennium, has triggered a discussion on the diversification of the energy mix. China faces the urgent challenge of moving from a dirty fuel system to one based on the wider use of clean and renewable energy sources, increasing energy efficiency, and rational energy management. The availability of fossil-based resources in the world is limited and will deplete over time. In these circumstances, experts expect that the costs associated with the exploration and extraction of additional amounts of fossil fuels will increase due to the growing demand for energy produced from traditional sources. At the same time, however, the pressure to reduce carbon dioxide emissions will increase, including in the form of mandatory limits. This is leading many countries, including China, to significantly increase the share of energy obtained from alternative sources in their energy balance sheets in a way that does not contribute to CO_2 emissions. A diversified structure of energy consumption also has a direct impact on improving energy security. The development of the clean energy sector therefore represents a new source of economic growth, contributing to increased investment, infrastructure, and job creation.

However, the transition from coal to low-carbon power generation based mainly on clean source stakes time. Renewable energy continues to be more expensive than traditional energy sources. The costs of investment financing entail the need to incur high initial outlays that significantly exceed the subsequent operating costs. China's electricity consumption is concentrated in the eastern part of the country. This is important in the decision making related to creating new generation capacities. Excess installed capacity that is disconnected from the network, combined with the lack of adequate infrastructure to connect to the electricity grid, remains a major challenge. Other challenges include the limited capacity of distribution and transmission networks as well as electricity storage. All of these factors ultimately render it impossible to use renewable energy sources on a large scale. Their greatest weakness is that they do not guarantee a continuous energy supply. Energy security, meanwhile, requires a continuous supply of energy to society and the economy at acceptable prices. An

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additional problem concerning RES remains the lack of long-term experience and implementation of research that influences the level of innovation found in the solutions adopted. In this situation, China remains focused on supplying the market with mid-tier clean energy production equipment while providing a scant supply of highly advanced technologies.

The principle of sustainable development, which China adopted in the early 1990s, treats economic, social, and environmental factors equally. At the same time, it stresses the need to preserve resources and environmental values in a state that provides sustainable opportunities for current and future generations. Next, it prioritizes the principle of equal access to the natural environment, understood mainly in terms of intergenerational justice and preserving the sustainability of natural processes while protecting biodiversity. This approach requires the Chinese authorities to present an integrated way to implement this plan. China needs to think strategically about how to build an integrated system based on the efficient use of traditional and renewable resources and a form of energy demand management that is based on the rational use of electricity by end users. China is also forced to place emphasis on increasing energy productivity. The development of government policies, legal frameworks, and R&D programs must ultimately target innovation as well as the production and commercialization of clean, rational, and efficient energy use. In view of current international emissions standards for carbon dioxide, China – a country particularly dependent on fossil fuels – should focus on finding alternatives.

Following a sustainable development path means making better use of energy resources, thus improving the state of the environment. In their pursuit of sustainable development, the authorities in Beijing have adapted their support policy for the RES sector. These activities focus on introducing appropriate solutions which set concrete directions despite not having direct normative power. The proposed programs are general in nature, covering both the broad subject matter and strategies for solving specific problems. China also focuses on supporting research and development as well as financing RES investments at the central, provincial, and local levels. Notably, China assigns a strategic role to the energy sector in successive five-year plans, setting out the main trajectories of the country's development. The 13th Five-Year Plan (2016–2020) has clearly highlighted the importance of sustainable development, underlining the need to invest in renewable energy sources. This breaks down the legal, regulatory, and financial barriers to the development of this sector. China has become a world leader in green energy development, creating a financing mechanism that benefits domestic investors through state subsidies and tax breaks. Moreover, the consumption targets set for renewable energy sources are making the largest companies in the energy sector more inclined to pursue clean energy projects in the near future, limiting the role of coal-based energy to a moderate degree.

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Finally, one additional issue should be mentioned in light of the observations made in this article. Giving the development of China's renewable energy sector a boost may have important geopolitical implications. The benefits that China may gain from deploying RES are primarily related to improved security and greater energy independence. The expected increase in renewable energy production in China will automatically affect the main fossil fuel producers in the world, primarily through the expected decrease in import volumes. These changes can contribute to the technological development of renewable energy equipment and systems. China's position as a world leader in the development of renewable energy sources, the experience of the sector's companies, and its high competitiveness in terms of services and prices, have also turned the country into the largest global exporter of green technology, especially in the wind and solar energy sectors. The main targets of the components and products it offers are the countries covered by the Belt and Road Initiative. China's commitment to investing in these markets opens new business opportunities for domestic energy companies. The implementation of infrastructure projects abroad favors the export of both surplus production and green technologies. This allows China to indirectly influence the energy policies of the countries involved in the BRI. Their policy choice to favor clean and renewable energy sources place China in an extremely privileged position as a desirable partner for economic cooperation that provides high-quality, low-carbon technologies at a relatively attractive price.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

Chapter 5. Environmentalism as a vector of innovation in international policy: The case of the European Union

It would be no exaggeration to say that, until relatively recently, environmental protection was viewed as a domestic component of countries' policy domain. Indeed, the predominant framing of environmental protection was that of passive preservation of nature rather than taking active measures to implement policies aimed at creating, adopting, and respecting certain standards while carrying out long-term economic plans. The change of mindset from the former to the latter was a revolutionary development. In its former incarnation, environmental protection was focused on squarely on flora and fauna threatened with extinction and those parts of the geographical environment whose qualities and value were considered unique and of great importance for future generations. However, when confronted with the challenges of the modern world, this approach strikes even those casually familiar with environmental protection as old-fashioned or even obsolete.

Today, the landscape of environmental policy is completely different. Modern approaches aim to reconcile the economic development of a country with acknowledging the need to protect environmental resources because of their limited and often non-renewable presence in nature. Second, they aim to put an end to 'extensive' economic policies (characterized by the ever-increasing exploitation of resources and expansion of the means of production) while curtailing activities that come at the expense of human health and life. Finally, modern approaches liberate environmental policy from the fetters of national idiosyncrasies, as it is now self-evident that the circulation of factory fumes, particulate matter, exhaust fumes, and water pollution in does not recognize national boundaries.

At the same time, these transformations demonstrate how, in a relatively short period of time (the last quarter of a century), a fundamental change has taken place in the way in which the states define their political axioms. The transformations analyzed here requires a careful breakdown not only due to the growing importance of new dynamics such as organized environmental awareness, but also because such endemic movements are themselves strongly affected

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by pressure from the international environment – on both the economic and political level. The economic dimension is a reflection of the growing competition between national economies, where ecological innovation significantly reduces production costs. The political dimension can be (very) concisely summarized by stating that, in a world that is increasingly interconnected politically and culturally, political pressures reflect the progressive internationalization of standards.

In the transformation of national legal systems (and thus of internal policies), nowhere else is the interplay between these two dimensions as evident as in the member states of the European Union. And nowhere else does it affect everyday life as much as it does in EU societies, and on so grand a scale. This phenomenon is noteworthy because the recent emergence of environmentalism as a new determinant in international relations is changing the way policies have been understood and practiced over the centuries. It is no longer merely a natural consequence of the size of the economic, demographic, and/or military potential that a country possesses, but also of growing respect for environmental standards – sign of the times in itself.

1. Antecedents of the European Union's environmental policy

On a methodological level, we must open this chapter with a key introductory remark, namely that the environmental law of the European Union must not become the sole object of analysis without regard for national legal systems. Similarly, it is impossible to decouple its development from the larger body of EU law. On the one hand, EU and national law remain in a constantly changing relationship based on mutual interaction. On the other hand, we cannot overlook the fact that EU environmental law is an integral part of the EU legal order. In both cases, separating these issues analytically would lead to incorrect hypotheses and, consequently, to false conclusions.

However, this observation does not lessen the need for a thorough analytical breakdown of EU environmental law as a separate research area. This approach is all the more justified because, in recent years, research on the topic has developed a terminology and methodology of its own – and, even more importantly, an implementation toolkit that is separate from other EU fields and policies. The latter in particular deserves close attention because, much like a lens focuses a beam of light, it brings together a diverse set of social expectations with regard to standard-setting while acting as a laboratory where new measures to facilitate or assist in the ecological reconstruction of the economy are periodically tested. This is an extraordinarily difficult task that whose necessity stems from the scale of the challenges that humanity is facing for the first time in its history.

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The EU-wide mechanisms discussed here are anything but hollow – in fact, the argument that they are is immediately undermined by the fact that the environmental law of individual EU countries reflects EU environmental law to a significant extent, and in some cases even fully incorporates it. However, we must attach even more importance to the idea that the influence of EU law comes from its supranational scope and weight. No other law entails such far-reaching changes in the operations of individual states and their economies as environmental protection law. Additionally, while the impact of other legal regulations can be easy to predict (e. g., certain fiscal or social impacts), it is still impossible to forecast the economic impact of environmental regulations with complete or near-complete certainty.

Being aware of this is only the first step toward attempting to answer the question that it triggers: is the influence of EU law on national legal frameworks measurable, and if so, to what extent? Indeed, these considerations should prompt a diagnosis of the impact of environmental law on policy at both national and international level. Although this influence is undoubtedly becoming more and more apparent, the scholarly community remains imperfectly aware of all the cause and effect relationships that result from it. This is an important gap to address, as these (inter)national repercussions are a characteristic feature of the social-political relations brought on by the advancement of ecological attitudes in our contemporary era of globalization.

In this chapter, our starting point and first task will be to delineate the terms and concepts that will serve as the basis for our analysis. There is nothing more frustrating in the course of conducting an analysis than the use of concepts to which different interlocutors attribute different meanings. Preempting this will not only facilitate a meaningful discussion, but also help us avoid certain rhetorical and argumentative pitfalls that so often threaten and undermine the accuracy of scientific discourse. Last but not least, it will allow us to free ourselves from the chains of tautology, as *idem per idem* argumentation is all too common in the contemporary political debate on environmental protection.

As always, when it comes to the origins of a certain socio-political concept, the literature on the subject reveals a long-standing search for its oldest antecedents. While were cognize the desire to demonstrate cause and effect relationships between sociopolitical and economic processes (even ones that are decades or centuries apart), we must caution that the search for such ideological precursors often omits important sociopolitical and historical context that explains a given phenomenon or process. After all, ancient civilizations and even the thinkers of the Renaissance embraced a completely different set of priors to the concept of living in harmony with nature than the ones we rely on today. Thus, we should be skeptical about theories circulating in the online public square likening contemporary notions of environmentalism to visions of the ecologically defined

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

bond between man and the surrounding that pervaded ancient Rome and China or the writings of Spinoza, Rousseau, Thoreau, and Gandhi. All of these juxtapositions should be seen as a curiosity rather than as scientific fact derived using scholarly methods.

The quest for such far-reaching philosophical inspirations for modern ecological thought also seems unwarranted to us because we do not see the need to create loose philosophical associations between historical and modern understandings of environmental protection by dressing the latter up in ancient costumes. With all due respect to our ancestors who treated the world with a certain religious appreciation, it is impossible to bridge the epistemic gap between passive worship of nature and fear of the elements that characterized centuries past and the purposeful environmental action that we take to preserve our natural space today. This difference is best illustrated by the fact that the technical means that *homo sapiens* had at their disposal in past centuries do not compare to what we wield today. Suffice it to say that humans can now irretrievably destroy Earth's entire ecosystem without much effort – a power we have not held at any time in the past.

It is only through our awareness of these differences that we can begin to form a new notion of the state of the environment and the barriers to further 'extensive' development policies that derive from it. The transformation discussed here should be judged from a similar perspective, as it has become the cornerstone for global efforts to seek remedies against the perceived progressive ecological destruction of our planet. Determining who or what was the springboard for these transformations is not only a daunting task, but also one that is empirically unnecessary. We will therefore limit our predilection toward portraying events on a linear timeline to just one historical reminder, namely the Club of Rome's publication of a 1972 report titled *The Limits to Growth* by Donella H. Meadows, Dennis L. Meadows, Jørgen Randers, and William W. Behrens III.[424] This was a work whose pioneering contributions clearly heralded a new era and whose environmental message was the first to reach a mass audience at such a scale.

The importance of the report is underscored by the fact that it paved the way for subsequent publications in a similar vein, eventually making made environmental issues a permanent feature of the public debate. By abandoning hermetic language, but at the same time not falling into the exaggerated tone of popular scientific pontification, the authors of the report succeeded in bringing the research process in which they participated closer to the public in a concise

424 See Donella H. Meadows / Dennis L. Meadows / Jørgen Randers / William W. Behrens III, *The Limits to Growth.* A Report for the Club of Rome's Project on the Predicament of Mankind, Universe Books, New York 1972.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

and effective way. So much so, in fact, that it was no longer possible to ignore environmental issues, let alone disregard the causal link between the state of the environment and the state of humanity and society, between the degree of economic development and its dependence on the use of natural resources.

Examining some of the key statements made by the Club of Rome report will allow us to identify the exploratory achievements of its authors, but also delve into their thought process. The research objective of the project was to identify and describe the relationships between factors such as industrial production *per capita*, population size, amount of food *per capita*, non-renewable natural resources, and environmental pollution. On the epistemic level, the project itself is simply a more elaborate version of Thomas Malthus's carce resource theory. The correspondence is based on more parameters than just the volume of food production, which forms the cornerstone of the Malthusian theory. However, the scientific significance of this project – as well as the focus of media interest – lies in the fact that the authors used computer modeling to determine the future course of socioeconomic development. In 1972, defining the relationship between the aforementioned variables through modeling constituted a major research breakthrough.

Based on their models, the authors of the project presented three scenarios for economic development ('standard run,' 'comprehensive technology,' and 'stabilized world') and conclude that: "If the present growth trends in world population, industrialization, pollution, food production, and resource depletion continue unchanged, the limits to growth on this planet will be reached sometime within the next one hundred years. The most probable result will be a rather sudden and uncontrollable decline in both population and industrial capacity."[425] It is impossible to view the conclusions from the hypothetical scenarios presented in the report as optimistic. On the contrary: assuming that the current directions of development remain unchanged, the authors state that the global system will suffer comprehensive devastation even before the end of the 21st century. As with all forecasts, the caveat in this one is that certain input values incorporated into the model as a given may paradoxically turn out to be an opportunity for mankind if the inhabitants of our planet change their individual attitudes towards, for instance, the protection of natural resources.

If this transformation succeeds, it may lead to stabilization (equilibrium) within the global system, which would consist in minimal risk of resource depletion on the one hand and ensuring that human needs are nevertheless met on the other. Following the authors of the report, we can assume that this balance will be achieved once population growth will be curbed and the consumption of non-renewable resources will be reduced, while humanity transitions to more

425 *Ibidem*, p. 23.

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rational use of renewable resources. In order to build such a model of sustainable development, it is necessary to meet the following conditions:

(a) For population growth, it is necessary to popularize the nuclear (2+2) family model by ensuring access to effective means of birth control;
(b) For economic growth, it is necessary to maintain industrial production *per capita* at the 1975 level, combined with a transition away from increasing capital investment in industry toward the production of consumer goods.

The formula of the model presented in *Limits to Growth* allows us to evaluate it as a redeployment of the speculative justifications of Malthusian theory. On the other hand, the work itself, despite its heavy use of tools derived from the exact sciences, is unavoidably permeated with elements of social and cultural commentary. Nevertheless, we agree with Matthew R. Simmons, who analyzed *Limits to Growth* from an empirical standpoint and concluded that while "*there are some serious doomsday elements laid out which our world would face if the conclusions of this modeling work were ignored*," the authors' chosen research method and empirical approach were sound.[426]

It would be difficult to find a better endorsement of the report's conclusions if we consider Simmons formulated his conclusions 30 years after the publication of the report. Therefore, without wading into a discussion about the validity of the Report's theses, even if one treats its forecasts as sometimes exaggerated, and even if the results anticipated in the models did not fully correspond with reality, the pioneering nature of the study remains beyond discussion. The warning conveyed by the report, which rang the ecological alarm bells loud and clear, apparently worked. Today, the impact of the report on the subsequent public debate is not only indisputable, but also profound, given that the publication of *Limits to Growth* ultimately became the springboard for numerous attempts to find a solution to some of the global problems that we as a species brought upon ourselves.

2. The European Union's environmental protection policies

Just as the public was somewhat slow to realize that humanity must take greater responsibility for the state of the environment, so was the European Economic Community. Although it was only in the Single European Act (SEA)[427] of 1987

426 Matthew R. Simmons, *Revisiting the Limits to Growth: Could the Club of Rome Have Been Correct, After All?*, 2000, https://www.estudiomc.es/documentos/revisiting-the-limits-to-growth.pdf.

427 Article 130r SEA [now Article 191 TFEU] [in:] OJEU L 169, 29.6.1987, p. 25.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

that the Community delineated its authority in the field of environmental protection, early legal steps in this subset of Community policies date back to around 1967.[428] The first such step was combining what was then Article 100 TEC [now Article 115 TFEU] and Article 235 TEC [now Article 352 TFEU], resulting in the Union receiving a mandate to take all appropriate measures, provided that the Union's act proves "necessary to attain objectives laid down by the treaties when the latter have not provided the powers of action necessary to attain them."[429] This provision encompasses environmental protection.

The next step was to define the principles of environmental policy in the Community based on the findings of the heads of state and government of the member states in 1972. These principles were subsequently transformed into so-called Action Programmes that cover the following periods: 1973–1976 (1st Programme), 1977–1982 (2nd Programme), 1983–1986 (3rd Programme), 1987–1992 (4th Programme), 1993–2001 (5th Programme), 2002–2012 (6th Programme), and 2013–2020 (7th Programme, titled *Living well, within the limits of our planet*). However, it was only Council Directive 85/337 on the assessment of the effects of certain public and private projects on the environment of 1985 that truly marked a milestone in the emerging environmental policy of the European Community (and subsequently the EU).[430] The standards of oversight that this directive introduced elevate its importance to the same echelons the introduction of Article 130r TEC [now Article 191 TFEU] into the legislation of the European Economic Community in 1987, itself a groundbreaking moment in the development of EU environmental policy.

2.1 Defining the regulatory environment of environmental protection in the EU

Despite significant achievements in the field of environmental law, to this day, there has been no attempt to define the term 'environment' in EU law.[431] This opens considerable space for interpretation, not all of which is beneficial to our species' natural surroundings. Although this multitude of interpretations does not allow for a clear-cut definition of the term 'environment,' it at least allows us to reconstruct it. The first environmental protection directive of 1967, which has

428 Ludwig Krämer, *Die Rechtsprechung des Gerichtshofs der Europäischen Gemeinschaften zum Umweltrecht 1992 bis 1994*, "EuGRZ" 3–4 (1995), p. 45–53.

429 Consolidated version of the Treaty on the Functioning of the European Union [in:] OJEU C 326, 26. 10. 2012, p. 47.

430 Council Directive 85/337 of 27 June 1985 on the assessment of the effects of certain public and private projects on the environment [in:] OJEU L 175, 5. 7. 1985, p. 40.

431 Astrid Epiney confirms this in the context of case law in the Court of Justice of the EU (Astrid Epiney, *Umweltrecht der Europäischen Union*, Baden-Baden 2019, p. 35–37).

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

been amended several times since, enumerates the following components of the concept in Article 2: water, air and soil, and the interactions among them as well as the interactions between them and living organisms.[432]

Similarly, Council Directive 75/439 of 1975[433] and Council Directive 82/883 of 1982[434] both explicitly include water (including groundwater), the surface of the earth and its subsoil, and air in their concept of the environment. In Council Directive 85/337, already mentioned here, we find the following elements: human beings, fauna, and flora (Article 3, first indent), soil, water, air, climate, and the landscape (Article 3, second indent), and the interaction of these factors (Article 3, third indent). Surprisingly, the authors of the Directive also included material assets and cultural heritage in this list (Article 3, fourth indent).

If we include environmental elements listed elsewhere, such as nuisance through noise or odors,[435], human health,[436] and finally minerals, biotopes, and ecological systems,[437] the composite concept of the environment as imagined by the European Union may ultimately consist of the following elements inconstant interaction with each other: humans beings, animals, plants, soils and subsoils, water, air, climate, biotopes and all ecological systems, landscapes and surrounding environments, peace and quiet, natural fragrances, and cultural assets. At the same time, this amalgamated conceptual approach carries another important implication, namely that protecting the natural environment lies within the domain of deliberate human activity. Thus, environmental protection does not extend to the self-restorative actions of nature itself.

This anthropocentric starting point in the area of environmental protection is well documented in other European Union legislation. Among these instruments, the Resolution of the Council of the European Union of 1 February

432 Council Directive 67/548 of 27 June 1967 on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labeling of dangerous substances [in:] OJEU L 196, 16.8.1967, p. 1.

433 Council Directive 75/439 of 16 June 1975 on the disposal of waste oils [in:] OJEU L 194, 25.7.1975, p. 23–25, replaced by EP and Council Directive 2000/76 of 4 December 2000 on the incineration of waste [in:] OJEU L 332, 28.12.2000, p. 91.

434 Council Directive 82/883 of 3 December 1982 on procedures for the surveillance and monitoring of environments concerned by waste from the titanium dioxide industry [in:] OJEU L 378, 31.12.1982, p. 1.

435 Council Directive 75/442 of 15 July 1975 on waste [in:] OJEU L 194, 25.7.1975, p. 39, replaced by Directive 2006/12 of the European Parliament and of the Council of 5 April 2006 on waste [in:] OJEU L 114, 27.4.2006, p. 9.

436 Council Directive 86/278 of 12 June 1986 on the protection of the environment, and in particular of the soil, when sewage sludge is used in agriculture [in:] OJEU L 181, 4.7.1986, p. 6.

437 Council Directive 90/220 of 23 April 1990 on the deliberate release into the environment of genetically modified organisms, [in:] OJEU L 117, 8.5.1990, p. 15, amended by Directive 2001/18/EC of the European Parliament and of the Council of 12 March 2001 on the deliberate release into the environment of genetically modified organisms and repealing Council Directive 90/220 [in:] OJEU L 106, 17.4.2001, p. 1.

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1993,[438] which outlines a program for sustainable and environmentally just development that extends beyond the year 2000. The novelty of this program – the 5th Action Programme – was not only that it presented a large trove of data on the state of and forecasts on the development of environmental protection in Europe,[439] but also that it identified future risks. We will list them here not only for the sake of completeness, but mainly because they can serve as an example of the global challenges we face, which can only be solved through joint efforts. These risks include climate change, air and water pollution, predatory governance of natural resources, loss of species (both flora and fauna), the degradation of the urban environment and coastal areas, and storage and disposal of industrial and municipal waste.

Apparently, this list of risks achieved its intended effect, given that the 6th Action Programme (2002–2012) was no longer merely an assemblage of lofty words and even loftier appeals, but a full-fledged program with a clear action plan.[440] The current, seventh iteration of the Action Programme (2013–2020), which includes the following nine enumerated priorities:

a) Protecting, conserving, and enhancing natural capital;
b) Creating a resource-efficient, low-carbon EU economy;
c) Safeguarding the Union's citizens from environmental risks to health and well-being;
d) Ensuring better implementation of EU environmental legislation;
e) Improving the knowledge base for environmental policy;
f) Securing investments for environmental and climate policy and making costs realistic;
g) Integrating environmental requirements and considerations into other policies;
h) Promoting sustainable cities in the Union;
i) Increasing the Union's effectiveness in addressing regional and global environmental challenges.[441]

438 Resolution of the Council and the Representatives of the Governments of the Member States, meeting within the Council of 1 February 1993 on a Community programme of policy and action in relation to the environment and sustainable development – A European Community programme of policy and action in relation to the environment and sustainable development [in:] OJEU C 138, 17.5.1993, p. 1.

439 Meinhard Schröder, *Postulate und Konzepte zur Durchsetzbarkeit und Durchsetzung der EG-Umweltpolitik*, "NVwZ" 4 (2006), p. 389–395; Walter Frenz, *Umweltschutz und Wettbewerbsfreiheit vor dem Hintergrund nachhaltiger Entwicklung*, "NuR" 3 (2006), p. 138–145.

440 Decision 1600/2002 of the European Parliament and of the Council of 22 July 2002 laying down the Sixth Community Environment Action Programme [in:] OJEU L 242, 10.9.2002, p. 1.

441 Article 2(1)(a) to (i) of Decision 1386/2013 of the European Parliament and of the Council of 20 November 2013 on a General Union Environment Action Programme to 2020 'Living

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However, the implementation of such an ambitious Programme remains dependent not so much on the (also significant) financial outlays involved, but on the adoption of systemic solutions that will enable the fastest and simplest possible incorporation of European Union law into national legal systems. This stems directly from the qualitative changes that have taken place in the EU's integration policy. While successive stages of European integration have been marked by such impactful measures as the abolition of controls on the movement of persons (Schengen), the introduction of the single currency, and – closer to our area of interest – the possibility of trading in rights related to greenhouse gas emissions, the next frontier of European integration will be the opening of public goods to the European consumer.[442]

A clean environment is one such public good – one that, in contrast with natural resources, is not characterized by competition and exclusivity of access. Indeed, the parties participating in environmental protection benefit from this participation without prejudice to the benefits obtained by other participants (no competition). At the same time, the positive impact of environmental protection is not confined within national borders (no exclusivity). To ensure the highest possible amount of and access to the public good in question(a healthy environment), the European Union must use the supranational spillover effect of its actions, taking into account the high level of environmental protection in some countries and high level of pollution in others.[443]

2.2 Legal and administrative environmental policy considerations in the EU executive process

Any analysis of the rules and operational procedures applied in the implementation of EU environmental protection policy should first examine the instruments that facilitate it – that is, the administrative rules and legal mecha-

well, within the limits of our planet' [in:] OJEU L 354, 28.12.2013, p. 171. Point (e) is incorrectly translated into Polish, based on the German version: "Verbesserung der Wissens- und Faktengrundlage für die Umweltpolitik der Union." The word "evidence" should be replaced by "database." See https://eur-lex.europa.eu/legal-content/DE/TXT/?uri=CELEX%3A32013D1386.

442 Randall G. Holcombe, *A Theory of the Theory of Public Goods,* "Review of Austrian Economics" 10 (1) (1997), p. 1–22; Stanisław Kwiatkowski, *Teoria dóbr publicznych i rynku metody ich produkcji* [in:] Mateusz Machaj (ed.), *Pod prąd głównego nurtu ekonomii*, Instytut Ludwiga von Miesesa, Warszawa 2010, p. 100–106.

443 Dirk T.G. Rübbelke, *Europäische Klimapolitik – Zentral oder dezentral?,* "Wirtschaftsdienst" 2 (2004), p. 128–132.

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nisms that that make environmental protection a reality.[444] However, a selective approach to this issue, without taking note EU administrative law in its broadest sense, would be fruitless and ineffectual. Decoupling the Union's implementation mechanisms from those of individual member states would make it impossible to capture all the features that contribute to how the European Union functions as a whole.

If we assume that the law is a means of organizing public life in general – and of controlling public administration in particular[445] – we must pinpoint the nature of the links between administration and the executive. Bearing in mind that the former refers to administration in the narrow sense (an executive institution), we should define the latter as any kind of activity by public authorities that is neither legislative nor judicial. According to Günter Püttner,[446] the terms 'administrative tasks,' 'state tasks,' and 'public tasks' are often used as synonyms, without the nuance and prudence that distinguishing between them requires.[447] While we partially share this opinion, it should be noted that, if the term 'state tasks' is understood as tasks performed by the state or government bodies, then 'public tasks' must refer to tasks performed by various types of organizational units.[448] Thus, it is no longer possible for the research community to concur with Püttner's hallmark statement that the term's scope should be limited to non-private entities. In modern times, this kind of carve-out can be seen as dated and unfounded.

The work of Horst Dreier is a useful reference point in defining the relationship between the executive and the administration – and, in particular, in providing a comprehensive answer to the question of where one ends and the other begins.[449] In line with his negative selection approach, an administration is neither an institutionalized organization, nor an apparatus of power created for specific purposes, nor is it the sum of authorities and offices alone. However, the intuitive correctness of Dreier's subtraction-based model cannot obscure the

444 Christoph Demmke / Grit Ludwig, *Die Europäisierung des nationalen Verwaltungsverfahrens- und Verwaltungsorganisationsrechts im Bereich des Umweltrechts,* "NuR" 3 (2001), p. 133–142.

445 Gunnar Folke Schuppert, *Verwaltungswissenschaft. Verwaltung, Verwaltungsrecht, Verwaltungslehre*, Nomos, Baden-Baden 2000, p. 455 n.

446 Günter Püttner, *Verwaltungslehre*, C.H.Beck, München 2000, p. 35–36.

447 Dirk Ehlers warns against the abuse of the term 'public' when compared with the 'administration' due to the ambiguity of the former. Idem, *Verwaltung und Verwaltungsrecht* [in:] Dirk Ehlers / Hermann Pünder, *Allgemeines Verwaltungsrecht*, De Gruyter, Berlin 2016, p. 8.

448 See also Martin Burgi, *Verwaltungsorganisationsrecht* [in:] Dirk Ehlers / Hermann Pünder, *op.cit.*, p. 259–261; Monika John-Koch, *Organisationrechtliche Aspekte der Aufgabenwahrnehmung im modernen Staat*, Duncker & Humblot, Berlin 2005, p. 143 n.

449 Horst Dreier, *Hierarchische Verwaltung im demokratischen Staat. Genese, aktuelle Bedeutung und funktionelle Grenzen eines Bauprinzips der Exekutive*, Mohr Siebeck, Tübingen 1991, p. 108 n., 121 n., 129 n., 141 n.

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point that a given entity's administration can be perceived as primarily an instrument for realizing the will of those who bear power.[450] This is true regardless of whether the entity is an absolute monarchy, a democratic state with strong rule of law, or an international organization.

Thus, with the caveat that we do not see administration in an organizational but rather a material sense, we must consider the member states' treaty obligations to facilitate the EU institutions' activities.[451] In this case, the basic challenge of these relations in the context of environmental protection is cooperation. Although the term 'cooperation' does not appear explicitly in the core EU treaties, this does not change the fact that Article 4 TEU includes, as a general legal principle, precisely the obligation to cooperate in good faith and to support the Union both horizontally and vertically. However, from a national point of view, this has far-reaching consequences, as the right mix of competences with regard to legislating, implementing, and enforcing the law by the European Union and the member states continues to be the subject of both legal and political disputes.

What is not in dispute is the nature of the problem, which affects all interested parties and concerns the delimitation of the prerogatives of the Union (to abbreviate a more complex issue) and the member states. Indeed, the division of these competences (Articles 2–6 TFEU) is still largely in line with pre-Lisbon Treaty arrangements. The one innovation is that a clearer framework for the distribution of competences has been introduced, which facilitates individual choices of prerogatives between the Union and the member states. However, "simpler" does not mean "simple." The Treaty of Lisbon has three basic types of competence:

a) exclusive EU competence (Article 3 TFEU),
b) shared competence with member states (Article 4 TFEU), and
c) supplementary competence (Article 6 TFEU).

However, there is one additional type of competence that cannot be overlooked – special competence. This allows Union to take steps to ensure that its economic,

450 See, e. g., Barbara Stollberg-Rilinger, *Der Staat als Maschine. Zur politischen Metaphorik des absoluten Fürstenstaats*, Duncker & Humblot, Berlin 1986, p. 62 n.; Helge Rossen, *Vollzug und Verhandlung: Die Modernisierung des Verwaltungsvollzugs*, Mohr Siebeck, Tübingen 1999, p. 16 n.

451 Article 4(3) TEU [in:] OJEU L 326, 26.10.2012 (consolidated versions of the TEU and the TFEU). "Pursuant to the principle of sincere cooperation, the Union and the Member States shall, in full mutual respect, assist each other in carrying out tasks which flow from the Treaties. The Member States shall take any appropriate measure, general or particular, to ensure fulfillment of the obligations arising out of the Treaties or resulting from the acts of the institutions of the Union. The Member States shall facilitate the achievement of the Union's tasks and refrain from any measure which could jeopardise the attainment of the Union's objectives."

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

social, and employment policies in the member states are coordinated at EU level (Article 2(3) and Article 5 TFEU). In addition, the framework for the distribution of competences described above rule out extending the scope of the Union's competences in the future. This, albeit in limited form, is made possible by the 'flexibility clause' of Article 352 TFEU (previously Article 308 TEC). The new version of the provision states that the Union can take action, but only within the framework of the policies laid down by the Treaties and when the action envisaged is necessary to attain one of one of the objectives of the Treaties.

The way in which Article 352 TFEU is formulated allows us to state that it sets out rules of conduct not only between the Union and the member states, but also between the Union bodies themselves. This is significant because Article 352 TFEU ensures that member states continue to exercise their sovereignty while cementing the legitimacy of the Union. However, there is another side to this coin. The mechanisms presented in Article 352 TFEU, whose clarity and coherence are not otherwise in question, are rendered relative when different actors apply different rules of competence distribution. For the sake of clarity, we will illustrate this with two examples. Due to its goal-oriented nature, the competence of harmonization allows the Union to issue "necessary" rules wherever such action is desirable from the Union's point of view (for example, Article 113 TFEU). A second example is the previously mentioned competence that stems from the need to coordinate member states' legal and administrative provisions on the one hand and those of the EU on the other. The importance attached to the latter principle is clear from even a surface-level review of the versions of TEU and TFEU produced as a result of the Treaty of Lisbon. These updated treaties mention "coordination" 36 times as a noun alone, in addition to ancillary uses.

Given this variety of solutions, the Court of Justice of the EU demands in its judgments that the choice of legal basis for any given legal instrument be based on objective and verifiable factors.[452] In the Court's view, these "objective and judicially verifiable facts" should include, first and foremost, the purpose and content of the measure. However, an examination of the methods that have been used or discussed for determining competence leads us to the conclusion that none of themare satisfactory. In order to develop a system for the distribution of competences, we can instead adopt a hierarchy based on the degree of 'integrational intensity' as an instrument to facilitate this task. This intensity would vary according to the degree of exclusive or shared responsibility for specific scopes of action or objectives between the EU institutions and the member states.

Although the division of competences between the Union and the member states results from the principle of conferral or conferred competences (Article 5

452 Christiane Trüe, *Das System der EU-Kompetenzen vor und nach dem Entwurf eines Europäischen Verfassungsvertrags*, "ZaöRV" 2 (2004), p. 394.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

(1) and (2) TEU), the Union's exercising of those competences is governed by other principles, namely the principles of subsidiarity and proportionality (Article 5(1), (3) and (4) TEU).[453] The importance of these principles is exemplified not only by the fact that both were incorporated into the Lisbon version of the Treaties based on the previous version (Article 5 TEC), but also by the fact that they reflect a legal position expressed in a Protocol to the Amsterdam Treaty.[454] These factors alone suggest that these principles merit a closer look. Pursuant to the principle of subsidiarity, the Union may take action in areas that do not fall within its exclusive competence only if the objectives pursued cannot be achieved by the member states – and, in addition, if they can be better achieved at the EU level. In contrast, the principle of proportionality means that EU action must not go beyond what is necessary to achieve the objectives of the Treaties in terms of both scope and form. In exercising its competences, the Union must therefore not only consider the objectives set out in the Treaties, but refrain from going beyond them. Thus, pursuing the objectives of the EU cannot constitute a basis for creating new competences for the EU. This in turn means that it would be incorrect to assume that the extension of the Union's competences is possible by mixing and matching objectives and competences.[455]

It is particularly problematic when discord arises between sources of competence, i. e. when authorities at different levels vested with competence based on different legal foundations are involved in the adoption of the same legal act. Another issue is that the Treaties describe competences and the authority associated with them in a way that enables the EU in particular to legislate on various geopolitical levels. For instance, the Union is allowed to legislate in a number of areas (policies) that are not normally the domain of international organizations. It is reasonable to say that the European Union not only exceeds the level of integration of other international organizations, but even resembles a federal state in the way it operates. The need for the EU to coordinate the Common Foreign and Security Policy (CFSP) is a clear illustration of how intertwined and essential integration and cooperation are in defining the playing field of EU lawmaking.[456]

453 See also: Protocol A to the Treaty of Lisbon on the application of the principles of subsidiarity and proportionality [in:] OJEU C 306, 17. 12. 2007, p. 1.

454 Treaty of Amsterdam amending the Treaty on European Union, the Treaties establishing the European Communities and certain related acts – Protocol annexed to the Treaty of the European Community – Protocol on the application of the principles of subsidiarity and proportionality [in:] OJEU C 340, 10. 11. 1997, p. 105.

455 Vanessa Hellmann, *Der Vertrag von Lissabon*, Springer, Berlin-Heidelberg 2009, p. 59.

456 Rupert Stettner, *Zwischen Integration und Zerfall: Die "Verstärkte Zusammenarbeit" des Unionsrechts* [in:] Gilbert H. Gornig et al. (eds.), *Iustitia et Pax*, Duncker & Humblot, Berlin 2008, p. 779–791.

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2.3 Building an EU executive enforcement system

Over the years, scrutinizing the workings of specific political organizations has shown that the chosen way or model through which the executive (and the administration) implement political decisions can be highly problematic in complex political systems. Here, "complex" refers not only to the intricacies of federal systems such as those in Germany or the U.S., but also the system of the European Union, however nascent or emerging. In both systems, this complexity stems from two distinct dimensions:

- the division of competences and powers to issue binding political decisions, which we call lawmaking, and
- the distribution of powers and responsibilities for the legal application and implementation of these political decisions, which we call executive enforcement.

The former refers to the division of competences and powers between the 'suprasystem' (an alliance, a union, a confederation) and the 'subsystem' (member states, states, Länder or federal states, cantons) for legislative decision-making.[457] In this sense, suprasystems and subsystems have practically identical powers in the structures that form the political system analyzed here as far as issuing legal acts is concerned, while maintaining the constitutionally adopted division of competences. The latter, however, is different. Here, the right of the subsystem to enforce its own policies – and thus to treat executive activity as an internal matter – remains a fundamental systemic principle of the federal order. Hence, interventions by the suprasystem– irrespective of the constitutional (treaty) solutions in question – must generally be seen in the executive activities of the subsystem as action that undermines the federal system. The mutual balance of legislative and executive powers between the two systems is further complicated by the fact that, according to the accepted classical understanding of separation of powers, there is an incompatibility between lawmaking and implementation. At the same time, modern political practice shows that legislative elements are increasingly seeping into the executive, making the latter increasingly involved in the lawmaking process.[458]

However, neither this process nor existing attempts to federalize the Union entitle it to act as a suprasystem vis-à-vis member states (as subsystems).[459]

457 The terms 'suprasystem' and 'subsystem' are used here in line with Miller's living systems theory: James G. Miller, *Living Systems*, McGraw-Hill, New York 1978, p. 595–745 and 903–1023.

458 Bernd Becker, *Öffentliche Verwaltung*, R.S. Schulz, Starnberg 1989, p. 74–77.

459 Albrecht Weber, *Vom Verfassungsvertrag zum Vertrag von Lissabon,* "EuZW" 1 (2008), p. 7–14.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

Although the European Union differs from the definition of an alliance in international law due to the binding nature of EU law (i. e. the principle of direct legal effect) and the existence of EU bodies that are authorized to create such law, this law can only be established on the basis of the aforementioned Treaty mandates and in accordance with the framework for the division of competences set out in Articles 2–6 TFEU. In addition, wherever those powers are not exclusive, EU law may take primacy, but only within the limits defined by the principle of subsidiarity and taking into account the principle of proportionality, in accordance with Article 3 TEU and Articles 5 and 352 TFEU.[460]

The enforcement activities of the European Union provide no arguments in favor of framing the Union as a suprasystem – not only because it does not have fully developed administrative instruments for each member state, but mainly because the implementation of EU law is a matter for member states. Hence, the relationship between the Union and its constituent states is characterized not by coercion but by cooperation and mutual loyalty (Article 3(3) TEU). European integration has resulted in a system in which political and legal decisions are ultimately made through cooperation. This applies both to the decision-making process in legislative procedures under Article 289 TFEU and to the way in which courts rule under Article 267 TFEU, and finally to administrative implementation as outlined in Article 197 TFEU.

Although the mandatory enforcement of EU law stems from the requirement to apply the principle of primacy of EU law over national law, Werner Schroeder convincingly argues that the core underlying factor is the member states' desire to maintain the effectiveness of the application of EU law.[461]Member states are convinced that, in the long run, it is more worthwhile to respect EU law than to disregard it. However, it is no less important that the binding nature of Union law extends not only to the member states as a whole, but also to individual citizens as well as to the judiciary and national authorities. As a result of the direct application of EU law, the courts and authorities in question are obliged to apply it and that citizens of the Member states can directly invoke the rules of EU law.

The considerations above could lead a reader to the conclusion that the application of EU law comes down to a simple enforcement process. Nothing could be further from the truth. Both the Treaties and other legal acts that form the

460 Angelika Emmerich-Fritsche, *Der Grundsatz der Verhältnismäßigkeit als Direktive und Schranke der EG-Rechtsetzung*, Duncker & Humblot, Berlin 2000; Uwe Kischel, *Die Kontrolle der Verhältnismäßigkeit durch den Europäischen Gerichtshof,* "EuR" 3 (2000), p. 380–402; Thomas von Danwitz, *Der Grundsatz der Verhältnismäßigkeit im Gemeinschaftsrecht,* "EWS" 9 (2003), p. 393–402; Jan W. Tkaczyński, *Ustrój federalny Niemiec a system decyzyjny Unii Europejskiej*, Wydawnictwo Uniwersytetu Jagiellońskiego, Kraków 2005, p. 113–132.

461 Werner Schroeder, *Durchsetzung des Unionsrecht* [in:] Matthias Niedobitek, *Europarecht: Grundlagen der Union*, De Gruyter, Berlin 2014, p. 686.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

underpinnings for the European Union lack a formal definition of the term 'application' or 'implementation.' Because it is not a technical term built into EU law, by default, it covers all instruments (measures) that serve to maintain the uniform application of Union law, and only this broad interpretation can serve to delimit its scope.[462] The measures in question include all those that:

a) allow for the application of Union law, including EU administrative action,
b) facilitate the enforcement of Union law by means of sanctions, and
c) support legal and judicial protection in the EU.

This typology intersects with the dichotomy of distinguishing between the application of the law by either the Union or by its Member states. However, this distinction (with strong touches of federalism) does not align with the complexity of implementing EU law. This can be illustrated with numerous examples that show that the vertical and horizontal links between the Union and the member states are so diverse that one can go so far as to call them European administrative cooperation.[463] Furthermore, precise classifications are hindered by the fact that, if one the application of Union law is interpreted as equivalent executive enforcement, it is uncertain which center of EU decision-making possesses the necessary authority and competence, but also which one is empowered to lay down rules of enforcement. The Treaties themselves fail to provide a clear answer to these questions.

The existing Treaty provisions (Article 5(1) and (2) TEU) do not require a clear indication of the basis of competence when seeking to determine who has the authority to implement Union law. As long as a given competence can be justified with an argument about functional efficiency, it is considered acceptable. Thus, the Treaties refer to policies and areas (tasks) in which the Union can take action, but there is no distinction between the competence to legislate and the competence to implement and enforce EU action. This leads to the conclusion that the authority to implement EU law and to determine the correct procedures in this area are most likely to be derived from unwritten rules of conduct called implied powers. This is the true for both the Union and individual Member states. The Union may thus introduce individual enforcement provisions in the various policies that are already binding for the member states. However, the question of whether it would be permissible to regulate executive enforcement by applying EU administrative law based on a combination of regular legislative procedures

462 Siegfried Magiera, *Durchsetzung des europäischen Rechts* [in:] Reiner Schulze / Manfred Zuleeg / Stefan Kadelbach (eds.), *Europarecht*, Nomos, Baden-Baden 2010, p. 510.

463 Ino Augsberg, *Europäisches Verwaltungsorganisationsrecht und Vollzugsformen* [in:] Jörg Philipp Terhechte, *Verwaltungsrecht der Europäischen Union*, Nomos, Baden-Baden 2011, p. 243.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

(Article 294 TFEU) and the flexibility clause (Article 352 TFEU) remains disputed and controversial, and not only in the academic literature on the subject.[464]

Since only a small part of Union law is implemented by the Union through bodies such as the European Commission and institutions such as the various Union offices and agencies, the ways in which the law is implemented by both the EU and the member states requires further analysis. This is supported by phrasing used in Articles 197, 291, and 298 TFEU, which collectively suggest that the responsibility to implement EU law should be shared between the Union and the member states. The reason for this is non-trivial. The Union operates an administrative apparatus that is both diverse sufficiently developed organizationally. Nevertheless, the notion that EU law is implemented by the EU on behalf of member states as a rule rather than as an exception, which has found some acceptance in the literature, is rather dubious.[465]

The opposite argument, based on the Article 291(1) TFEU, states that the implementation of EU derived law (secondary legislation) is one of the obligations of the member states rather than a vehicle enabling them to lay down the rules of enforcement themselves. Thus, with a view to effectively implementing EU law, the Lisbon version of Article 197 TFEU is intended to minimize the competence-based tensions between the Union and the member states in this area. Ultimately, the question of which institution has the competence necessary for implementation and who is actually allowed to lay down the rules governing implementation can only be answered based on analyses of individual pieces of primary and secondary EU legislation.

However, this does not change the fact that, depending on the category, EU law is generally subject to implementation by the member states, which can take place either directly or indirectly. In terms of effects, the implementation process can be described as *pro statu*, *pro communitate,* and *pro recognitionem.*[466] In addition to the "every state for itself" (*pro statu*) principle, which is most frequently applied to the implementation of Union law by member states,[467] there are two others. In the process of implementing EU law, a member state may follow the "one state for all" principle (*pro communitate*) or its inverse, i. e. implement the law by recognize other member states' decisions as its own (*pro recognitionem*).[468]

464 Christoph Krönke, *Die Verfahrensautonomie der Mitgliedstaaten der Europäischen Union*, Mohr Siebeck, Tübingen 2013, p. 54 n.

465 *Ibidem*, p. 29.

466 Dirk Ehlers / Hermann Pünder, *Allgemeines Verwaltungsrecht*, *op.cit.*, p. 221–226.

467 Gerd Winter, *Kompetenzverteilung und Legitimation in der Europäischen Mehrebenenverwaltung,* "EuR" 3 (2005), p. 255–276, in particular p. 255–256.

468 Gernot Sydow, *Verwaltungskooperation in der Europäischen Union*, Mohr Siebeck, Tübingen 2004, p. 138 n.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

Both the second and the third case pertain to the transnational consequences of a member State's action. The point of reference for the legality of an action is not only EU law, but also the law of the state that issues the action. However, other member states cannot use their own national legal frameworks to assess the legality of the law in question, nor can the country that issues it.[469] Thus, as Dirk Ehlers argues, the annulment of transnational administrative acts as well as their judicial protection are within the exclusive purview of the authorities and courts of the issuing country.[470]

Since life brings new problems that are not always resolved without conflict, the EU's secondary legislation states that the adoption of a transnational legal act must be preceded by a consultation with the Union or with the other member states. This is undoubtedly meant to avoid situations that, in the event of a conflict between national law and Union law, lead to the suspension the act's implementation or to the Union's decision to suspend it.[471] Any opposition by the competent authorities of other member states amounts to devolution, i. e. the act of a state requesting that the competence to resolve the dispute be transferred from one administrative authority to another (typically one that is superior). If the member states are unable to resolve a dispute between themselves, the procedural authority is transferred to the European Commission, which, pursuant to the regulatory procedure contained in the Regulation,[472] makes a substantive decision with the assistance of the relevant committees (comitology), and that decision is subsequently communicated to the member states.

The specific nature of the enforcement of administrative acts *per recognitionem* also merits a separate discussion. In this case, a state can implement EU law by recognizing the relevant decisions of other member states as its own. The state in question does this either in accordance with directly applicable Union law or under its own law. The fact that this kind of recognition takes place in advance and according to the country's own legal points of reference[473] does not mean that a cohesive and universally accepted definition of 'recognition' exists. Therefore, recognition can only take place in this context when a state's adoption of an action that originated in another state has no directly binding transnational effects. Furthermore, it is predicated on an additional independent decision by

469 Matthias Ruffert, *Der transnationale Verwaltungsakt,* "Die Verwaltung" 4 (2001), p. 453–485, in particular p. 453 and p. 475. These pages describes exceptions in relation to invalid administrative acts.

470 Dirk Ehlers, *op.cit.*, p. 225–226.

471 Gernot Sydow, *Verwaltungskooperation in der Europäischen Union*, *op.cit.*, p. 151 n.

472 Regulation (EU) 182/2011 of the European Parliament and of the Council of 16 February 2011 laying down the rules and general principles concerning mechanisms for control by Member States of the Commission's exercise of implementing powers [in:] OJEU L 55, 28. 2. 2011, p. 13.

473 Gernot Sydow, *op.cit.*, p. 181 n.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

the authorities of the 'recognizing' country, albeit under the assumption that the decision of the 'origin' country constitutes a quasi-precedent. As long as there is mutual, automatic recognition (i. e. without the need to create space for a new decision in the 'recognizing' country), the states have access to a transnational administrative process that relies on the regulatory procedure outlined above in case of differences.[474]

2.4 Dilemmas of EU enforcement and implementation

While directly applicable regulations[475] allow the Union to regulate a full range of duties, directives[476] only make this possible for individual duties within the scope of what is already regulated by the member states. This is also the case when the EU aims to set minimum standards for a given legal norm. The legal dilemma that emerges here can be reduced to the question of whether establishing such EU standards means that a member state is prohibited from issuing legal standards that guarantee a higher level of protection for the legal interests in question.

From the point of view of national executives, whose task lies mainly in the implementation of the *acquis communautaire* into national law, this requires confronting the national executive with the two centers of EU power, i. e. the European Commission and the Council of the European Union. The problem is not so much the existence of an two legislative authorities within the EU system, but the lack of an institution at the intersection of these authorities to ensure the necessary coordination of executive activity, i. e. EU policymaking.[477] We may accept the dichotomy of understanding EU executive action as activities related to either direct or indirect enforcement, and thus analyze it in two separate domains, in line with a popular current in the literature. However, this does not explain the puzzling trend of clearly increasing normative and actual links between these types of activity.

However, it is the allocation and distribution of EU funds (as financial resources) that constitutes the best proof that mixed enforcement, which results from cooperation between the Commission's administration and the individual

474 Gernot Sydow, *Vollzug des europäischen Unionsrechts im Wege der Kooperation nationaler und europäischer Behörden,* "DÖV" 2 (2006), p. 66–71.

475 Article 288(2) TFEU [in:] OJEU L 326, 26. 10. 2012 (consolidated versions of the TEU and the TFEU).

476 Article 288(3), TFEU [in:] OJEU L 326, 26. 10. 2012 (consolidated versions of the TEU and the TFEU).

477 Fritz M. Marx was the first to formulate this term in 1946. Compare with the broader discussion in: Fritz M. Marx (ed.), *Elements of Public Administration*, Prentice-Hall, Englewood Cliffs 1959, p. 89–100, 337–338, and 348–349.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

administrations of the member states, can be seen as a new way of conducting the EU's enforcement activity (though not a new type of enforcement, as outlined below).[478] Administrative enforcement in the Union should also be examined from a material perspective. Since it is essentially the implementation of the legal norms embedded in EU law in individual cases, it should be understood as the fulfillment of a factual legal framework in time and space. Naturally, this is done both by EU bodies and by the respective administrations of the member states of the European Union. However, perceiving EU executive activity merely as a means of applying standards would ignore the existence of means of enforcement that are not specifically identified by the normative activities of the legislature, but are presented under the broad banner of administrative enforcement.[479]

Mixed enforcement can therefore be presented as an enforcement activity that comprises two phases: programming and enforcement. There is no doubt that the (co-)action of the Commission and the member states, starting from program building and ending in project implementation, constitutes different stages of administrative enforcement and implementation. If, for example, the allocation of funds for environmental protection is guided by an administration that handles both planning and operational enforcement, it is natural to ask how it fits into the EU system as a whole.

Although the structure of the Union's enforcement activities has been and continues to be analyzed by separating EU activities from those of the member states,[480] this division does not entirely correspond with the systemic realities of the Union. This argument is well supported by the observation that cooperation between these administrative levels is increasing.[481] Moreover, overlapping duties do not allow us to cleanly assign activities to one of the two types of executive activity. This is the result of administrative cooperation, in various forms, ranging from more or less informal exchanges of views to binding arrangements. Without them, the functional stability of the European Union as it exists today would be completely unthinkable.

478 Jan W. Tkaczyński / Rafał Willa / Marek Świstak, *Fundusze Unii Europejskiej 2007–2013. Cele –Działania – Środki*, Wydawnictwo Uniwersytetu Jagiellońskiego, Kraków 2008, p. 39.

479 Eberhard Schmidt-Aßmann, *Das allgemeine Verwaltungsrecht als Ordnungsidee: Grundlagen und Aufgaben der verwaltungsrechtlichen Systembildung*, Springer, Heidelberg 2004, p. 385; See also: Stefan Kadelbach, *Allgemeines Verwaltungsrecht unter europäischem Einfluß*, Mohr Siebeck, Tübingen 1999, p. 17–19.

480 Joachim Suerbaum, *Die Kompetenzverteilung beim Verwaltungsvollzug des Europäischen Gemeinschaftsrechts in Deutschland*, Duncker & Humblot, Berlin 1998, p. 116–118. For an exhaustive discussion: Hans C. Röhl, *Verantwortung und Effizienz in der Mehrebenenverwaltung,* "DVBl." 17 (2006), p. 1070–1079.

481 Armin von Bogdandy / Felix Arndt, *Die Zusammenarbeit der Finanzverwaltungen in der Europäischen Union,* "EWS" 1 (2000), p. 1–6.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

Moreover, the practice of enforcement activities in the Union shows, through numerous examples, how cross-cutting types of enforcement are created (e. g., requests for reimbursement of subsidies by national administrations on the basis of Commission decisions), new organizational procedures are defined (e. g., certification of product quality assurance), or joint bodies are set up (various types of committees at the Union level). The complexity and highly interlinked nature of implementation structures and processes at different levels leads to a situation where it is not always possible to identify the instigator of individual administrative measures. However, the examples of cooperative enforcement activity provided above cannot be classified as a third type of enforcement, as there is no other model of normative enforcement activity besides the two presented.

Due to the aforementioned lack of split competences at the EU level between legislation and enforcement, individual executive measures are forged in the institutions of the Council of the European Union and, above all, the European Commission. The latter is unique in that it wields a monopoly on submitting executive proposals. The preparation of the proposals in question takes place in the affiliate committees of the Council or the Commission. The multitude of committees in both institutions is not only a nuisance to all those trying to create an up-to-date organizational chart (organogram) of the Union,[482] but also has a negative impact on the efficiency and, most importantly, on the transparency of the whole implementation process from the point of view of the member states. For example, primary and secondary EU law that addresses environmental protection is supplemented and clarified by the Commission via an overwhelming volume of guidelines, circulars, and working papers.

All of these elements allow the Commission to steer member states' implementation activities within the framework of administrative cooperation. A major reason for this is that they are assigned a real role as steering instruments in the programming and execution process. While the guidelines in question can be described as EU *soft law* under international law, the question of their validity remains unresolved. Although these documents are non-binding for member states, their degree to which they are binding remains unclear in individual cases. Nonetheless, it is important to note that neither the formalization of an administrative procedure due to member states' participation in its creation nor its publication in the Official Journal of the European Union should be seen as tantamount to confirming the binding nature of these guidelines.

482 Manfred Schulte-Zurhausen, *Organisation,* Vahlen, München 2002, p. 495–498; See also: Jean-Paul Thommen, *Allgemeine Betriebswirtschaftslehre*, Springer Gabler, Wiesbaden 2003, p. 759.

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The growing number of rules in relation to executive enforcement demonstrates not only their greater flexibility but also the ease with which they are laid down. However, it is still reasonable to juxtapose and compare any given set of guidelines with corresponding EU regulations or decisions. At the same time, classifying these guidelines as merely explanatory auxiliaries addressed to the member states also fails to reflect their actual nature. It is undoubtedly the responsibility of the member states to remain aware of the Union's indications in the parts of their enforcement activities that involve the European Union in some way. Although it is possible to weaken such an interpretation by arguing that guidelines possess a formal legal deficiency consisting in lack of direct enforceability, they retain far greater power than any other acts announced by the European Commission.

The force of these guidelines derives from the fact that member states can be restricted from ignoring them in the course of implementing specific EU programs, projects, or initiatives. Comparing different legal acts of the EU also brings us to the conclusion that the spectrum of legal and administrative control available to the EU is widening. Although this is not just a matter of statistics, it is striking that the volume of secondary EU law with regard to administrative affairs is systematically increasing. This is not limited to material regulations, but also encompasses procedural and organizational provisions in relation to enforcement activities. Thus, a legal order is being created before our very eyes that uses administrative instruments to support complex mechanisms of governance in the European Union.

3. Impact of the primacy of European law on national law

More than a decade ago, Matthias Niedobitek pointed out that the actual extent of the impact resulting from the implementation of EU law into the national legal order, especially in the case of conflicts with national law, had not been sufficiently explained or explored.[483] This is still the case because Union law is not international law in the classic sense. It is also impossible to classify it into a single (coherent) legal structure together with national law.[484] As a result, every explanatory model that has been built on a foundation of legal theory has failed. Indeed, the relationship between EU and national law cannot be characterized by distilling monistic or dualistic elements from both. On the contrary – the

483 Matthias Niedobitek, *The primacy of Union law* [in:] Matthias Niedobitek / Jiri Zemanek, *Continuing the European Constitutional Debate*, Duncker & Humblot, Berlin 2008, p. 78.
484 Wolfgang Weiß, *Unionsrecht und nationales Recht* [in:] Matthias Niedobitek, *Europarecht: Grundlagen der Union, op.cit.*, p. 435n.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

uniqueness and specificity of these relations stems from the dynamics of the European integration process and, more specifically, from the effects of the primacy of EU law over the laws of the member states.

Existing case law from the Court of Justice of the EU shows that many problems in understanding the effects of the primacy of EU law arise from trying to mechanically transfer theoretical and legal models and concepts into EU law.[485] Secondarily, they derive from failing to justify the purpose of such attempts for the interpretation of the law by the CJEU. However, the Court always describes the primacy of EU law in terms of the effects of its application and "carefully avoids"[486] taking a position on theoretical issues. Therefore, if we take the case law of the CJEU[487] as a starting point for our deliberations, then any national law that conflicts with EU law must remain not be applied. Furthermore, it must either cease to be valid or, if it has already been passed into law, it must have no binding force from the outset.[488]

These findings are of paramount importance to us because they explicitly support those CJEU rulings that tackled the question of whether a rule in national law that conflicts with EU law can be regarded as non-existent, as in the Simmenthal ruling.[489] Determining that such acts are legally non-existent (i. e. that they are essentially non-acts) is not only a serious infringement of the law but also eliminates the possibility of seeing it as an effect of implementation of EU law into national law.[490] In the CJEU ruling in question,[491] the Court did not raise anything beyond what had already been said. By ruling that national law can produce no legal effect once a conflict arises between national law and EU law, it neither reviewed its existing position nor qualified it to any extent. Had it done so, it would imply that any degree of effectiveness of national law would con-

485 Judgments of the CJEU of 14 December 1995 – Case C-312/93 – Peterbroeck, Van Campenhout & Cie SCS v. Belgian State [in:] ECR 1995, I-4599, and of 1 December 1998 – Case C-326/96 – B.S. Levez v. T.H. Jennings (Harlow Pools) Ltd [in:] ECR 1998, I-7835.

486 See Advocate General Dámaso Ruiz-Jarabo Colomer, final comments tothe Judgment of the CJEU of 22 October 1998 in Joined Cases C-10/97 to C-22/97, Ministero delle Finanze v. IN.CO.GE.'90 Srl, Idelgard Srl, Iris'90 Srl, Camed Srl, Pomezia Progetti appalti Srl (PPA), Edilcam Srl, A. Cecchini & C. Srl, EMO Srl, Emoda Srl, Sappesi Srl, Ing.Luigi Martini Srl, Giacomo Srl and Mafar Srl [in:] ECR 1998, I-6307.

487 Judgment of the CJEU of 9 March 1978 – Case 106/77 – Staatliche Finanzverwaltung v. Simmenthal S.p.A. [in:] ECR 1978, p. 629.

488 Matthias Niedobitek, *op.cit.*, p. 79.

489 Judgment of the CJEU of 22 October 1998 – Joined Cases C-10/97 to C-22/97, see in particular Judgment of the CJEU of 9 March 1978 – Case 106/77.

490 Dirk Ehlers, *Die Lehre von der Teilrechtsfähigkeit juristischen Personen des öffentlichen Rechts und die Ultra-vires-Doktrin des öffentlichen Rechts*, Duncker & Humblot, Berlin 2000, p. 52–53.

491 Judgment of the CJEU of 22 October 1998 – Joined Cases C-10/97 to C-22/97, see in particular Judgment of theCJEU of 9 March 1978 – Case 106/77.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

stitute an inherent limitation to the claim of validity of EU law. However, there is no doubt that all national public institutions are obliged to abandon the application of all national law that is not compatible with EU law.[492]

However, the final and categorical nature of this determination is still up for debate. The lack of applicability of national law in the event of a conflict with EU law does not equate to its being rendered completely null.[493] Since EU law makes national law ineffective, or at least prevents its effective implementation (insofar as the scope of its own applicability allows it), effective EU primacy in the case of enforcement is equivalent to EU primacy in the case of validity, albeit without directly calling into question the national law that is found to be in conflict with its EU counterpart.[494] In brief, the primacy of EU law "only becomes relevant when EU law is applied in a particular proceeding."[495]

The existing differences of opinion on the effectiveness of the primacy of Union law have had another effect, albeit an unexpected one. That is, during the most heated period of debates on the final shape of the Lisbon Treaty, a "clarification proposal" was put forward in the literature.[496] This proposal boils down to abandoning the idea of nullifying the conflicting national law while adopting in its place a new, synonymous primacy of application, under the *lex specialis derogat legi generali* rule. A closer look at this replacement shows that it only mentions the conflict-of-law rule in its approach to primacy of enforcement, completely omitting the hierarchical rule, which leaves superseded law intact and makes no judgment on the legality of the conflicting national law. In a word, it is not the national law or norm that is rendered illegal, but the specific decision that disregards the primacy of EU law.

Although the proposed solution was innovative and ingenious, the thought process that it follows is flawed. Firstly, the proposed thesis is based on an insufficient understanding of the starting assumption that the conflicting national law is ineffective. Secondly, it does not provide sufficient opportunities to meet the specific requirements of the relationship between EU and national law. Finally, sit overestimates the importance of conflict-of-law norms. To take the

492 Rudolf Streinz, *Europarecht*, C.F.Müller, Heidelberg 2016, Rdnr. 216–222, p. 73–76.

493 Hans D. Jarass / Saša Beljin, *Die Bedeutung von Vorrang und Durchführung des EG-Rechts für die nationale Rechtsetzung und Rechtsanwendung,* "NVwZ" 1 (2004), p. 1–11, see in particular p. 7; Thomas Dünchheim, *Die Einwirkungen des Europarechts auf die verwaltungsprozessuale Normabwehr-, Normerlass- und Normergänzungsklage,* "DÖV" 4 (2004), p. 137–146, see in paticular p. 138.

494 Matthias Niedobitek, *Kollisionen zwischen EG-Recht und nationalem Recht,* "VerwArch" 1 (2001), p. 62 n.

495 Stefan L. Frank, *Altes und Neues zum Vorrang des Gemeinschaftsrechts vor staatlichem Recht,* "ZÖR" 55 (2000), p. 40.

496 Andreas Funke, *Der Anwendungsvorrang des Gemeinschaftsrechts – Einige Problemfälle und ein Präzisierungsvorschlag,* "DÖV" 17 (2007), p. 733–740. See in particular p. 733.

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first of these points further, the proposal is based on a dualistic understanding of mutual separation between EU and national law, which does not correspond with reality. However, the fact that these mutual legal relationships cannot be seen from a dualistic perspective does not justify the opposite (i. e. monistic) view. This brings into focus a number of seemingly opposing features of EU law: it has priority but no claim to supremacy; the conflict with national law leads to the latter's ineffectiveness, but without directly influencing its validity; and EU law cannot formally constitute a foundation for the creation of national law, but can be used to derogate it.[497] Ultimately, this leads to the conclusion that EU law cannot occupy a place in the hierarchy of the national legal order, which invalidates the argument that the conflicting national law is ineffective with respect to the hierarchical rule.

At the same time, primacy of enforcement cannot be understood as a mere tool for solving specific cases of conflicting legal norms, as it carries with it the implication that one of the laws in question is illegal. This allegation arises not from national law, but exclusively from EU law. It can even amount to an allegation that the national law constitutes an infringement of EU law, as long as it is possible to hold the 'offending' state liable.[498] Even if we can theoretically disentangle the binding nature of the law from its infringement of a broader law,[499] conflicts between EU and national law are a practical example of both these factors. That is, the binding nature of EU law was not respected, and the conflict is resolved through its primacy of enforcement. The conflict with the law whose removal is executed by the conflict-of-laws norm, can exist alongside the binding effect of the law only because the binding effect of Union law does not go so far as to affect the existence of conflicting national law.[500]

Thus, establishing a specific intent (*dolus coloratus*) is a necessary precondition for removing a conflict when it comes to the primacy of enforcement. This allows us to recognize situations where a national law is only partially ineffective as well as those where the factual state of affairs is correct even without the need to refer to EU law. This distinction is a logical extension of the limited primacy of EU law even if it does not fully align with the wording of the law. This

497 Matthias Niedobitek, *Der Vorrang des Unionsrechts*, *op.cit.*, p. 82.

498 Cf. the circumstances of EU states' civil liability in the CJEU judgement of 17 April 2007 – Case C-470/03 – A.G.M.-COS.MET Srl v. Suomen Valtio, Tarmo Lehtinen [in:] ECR 2007, I-2749.

499 Andreas Funke, *Der Anwendungsvorrang des Gemeinschaftsrechts*, *op.cit.*, p. 736 with reference to: Christian Bumke, *Relative Rechtswidrigkeit*, Mohr Siebeck, Tübingen 2004, p. 43. The distinction between a binding standard and a conflict-of-laws standard is also noted by Michael Sachs (ed.), *Grundgesetz Kommentar*, C.H.Beck, München 2014, Article 20, Rdnr. 95–102, p. 830–834.

500 Matthias Niedobitek, *The primacy of Union law*, *op.cit.*, p. 83.

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limited primacy is highlighted in both the literature[501] and in relevant case law.[502] We should underscore primacy of *enforcement* in particular because, even though the conflicting national law may remain on the books, it loses all enforceability precisely due to the primacy of EU law.[503] It also leaves open the possibility of examining whether the Union's bodies are not exceeding the powers conferred to them by the Treaties (*ultra vires*) when they adopt legislation. However, it is precisely when competing norms and standards arise that numerous legal effects are set in motion at the same time, without cancelling each other out.[504] The exclusion of certain legal effects in favor of others is a political and legal decision and not the result of irreconcilable effects. Thus, if EU law only demands unlimited application and enforcement (as is the case), then it is not an obstacle to the additional, competitive application of national law.[505]

Flawed perceptions of the effectiveness of the primacy EU law have been strongly influence by a fundamental misunderstanding of the conflict-of-laws norm itself. If we assume that the issue of primacy emerges only when a conflict arises, then it sensible to describe this primacy as a conflict-of-laws norm. When a conflict of laws takes place, it is this primacy ultimately determines which legal order should be applied. The proximity of this nomenclature to conflict-of-laws rules and norms in private international law reinforces this interpretation in line with existing precedents. Extrapolating these precedents allows us to argue that the principle of primacy fulfills the function of a conflict-of-laws norm under EU law. However, we should be extremely careful about assessing the validity of this statement. The latter is conditional on the assumption that the first step in the case of a pending dispute is to identify the source(s) law that should be applied. If the conflict-of-law norm that stipulates the primacy of EU law establishes that law as prevailing, the popular view that EU primacy constitutes a "meta-rule of Community law" is hardly surprising.[506]

All of this assumes that the EU and national legal order are somehow immune from conflict-of-laws situations, as if it were possible to logically separate EU law

501 Saša Beljin, *Die Zusammenhänge zwischen dem Vorrang, den Instituten der nationalen Bemachtlichkeit und der Durchführung des Gemeinschaftsrechts,* "EuR" 3 (2002), p. 351–376; See in particular p. 353; Dirk Ehlers, *Konfliktrecht im Verhältnis der Gemeinschaft zu dem Recht der Mitgliedstaaten* [in:] Reiner Schulze / Manfred Zuleeg (eds.), *Europarecht: Handbuch für die deutsche Rechtspraxis*, Nomos, Baden-Baden 2006, p. 396.

502 Judgment of the CJEU of 16 July 1998 – Case C-264/96 – Imperial Chemical Industries (ICI) v. Kenneth Hall Colmer [in:] ECR 1998, I-4695.

503 Reinhold Zippelius / Thomas Würtenberger, *Deutsches Staatsrecht*, C.H.Beck, München 2018, p. 648–649.

504 Klaus F. Röhl, *Allgemeine Rechtslehre*, C. Heymanns, Köln 2001, p. 583 n.

505 Matthias Niedobitek, *Der Vorrang des Unionsrechts*, *op.cit.*, p. 84.

506 Jörg Philipp Terhechte, *Temporäre Durchbrechung des Vorrangs des europäischen Gemeinschaftsrechts beim Vorliegen "inakzeptabler Regelungslücken"?,* "EuR" 6 (2006), p. 828–847. See in particular p. 835.

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from its primacy. It is equally inappropriate to compare the primacy of applying Union law with the *lex specialis derogat generali* rule. In the case of legislative decision-making, the crux of the problem is whether it is more appropriate to build the law on the basis of individual rules or whether it is better to limit the scope in advance to the literal application of a general rule. The cognitive exclusion of the conflict-of-law rule from substantive law cannot be misunderstood to imply that the general rule is broad in scope and can be limited only *ex post*, i. e. once the law is already applied. This understanding would greatly narrow the scope of application of the general standard. This also shows that also these 'technical' conflict-of-law rules apply to the norms themselves, and do not leave their claims to validity untouched.[507]

Last but not least, it is difficult to understand how national law cannot be applied, but nevertheless become effective. The universal understanding of the law as something that is to be applied and enforced, which forms a core component of all national legal systems, is precluded by the opposite impetus – to apply EU law – whenever there is a conflict between the two. Since the application of a norm or standard is an inextricable component of the process of constructing it, the primacy of EU law strips national law of the premise of effective enforcement. However, this primacy establishes not only an obligation to apply or to comply with EU law,[508] but also regulates conflicts at the level of the norm in question. Thus, the primacy of EU law carries both compulsory and material weight.[509] This ultimately allows us to conclude that any national law that clashes with that of the EU is ineffective. This is because it creates neither legal effects nor a useful legal basis for individual acts, including administrative acts, which are the focus of this chapter. Whether this renders the national law in question invalid is a matter for the national legislature.

4. Enforcement of EU law: Balancing the need for privatization with the challenge of Europeanization

The specific considerations presented above should be coupled with a broader, systemic perspective, which will be the focus of this section. The key question here is: To what extent and in what way has scope of the state's existing functions changed in its relations with the supranational organization that is the EU? Does the essence of the state and our understanding of it need to be altered or updated, and if so, what is the best way to reframe it? We know that the interlinked trends of

507 Matthias Niedobitek, *Der Vorrang des Unionsrechts*, *op.cit.*, p. 84–85.
508 Andreas Funke, *Der Anwendungsvorrang des Gemeinschaftsrechts*, *op.cit.*, p. 736 n.
509 Matthias Niedobitek, *Kollisionen zwischen EG-Recht und nationalem Recht*, *op.cit.*, p. 62.

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globalization, liberalization, and integration are not unique or limited to the territory of a single country.[510] Even if we accept that this state of constant change is a challenge to state sovereignty, it is also true that membership in a given political and economic organization allows for the creation of a similar level of development in all member states.

Our view and assessment of the impact of supranational legislation on national legislation must therefore take into account not only the transformation of the relationship between the state and the citizen, but above all between the member states and the organization that binds them. Nowhere else are these connected processes as apparent as in the European Union. In this case, one aspect of this transformation is the 'Europeanization' of the individual member states' laws. At the same time, if thus far the relationship between the state and the citizen in a democratic state governed by the rule of law has been based on mutual rights and obligations (recorded in the law as precisely as possible), this bipolar model now gives way to a multi-polar system of legal relationships with varying scopes and degrees of influence.[511]

We can also observe this metamorphosis of the relationship between the state and the citizen the relationship between the supranational organization and the member states. These changes are the result of both the sheer numerical growth of the tasks that each side takes on over time and qualitative changes in the way they are perceived.[512] In terms of the role and functions of the state, these changes can be broadly reduced to the following categories:
- requirements of cooperation,
- methods of governance,
- options for moderation,
- conditions for mediation and
- rules of communication.[513]

Despite these transformations, it would be premature to claim that they constitute a kind of withdrawal of the state. They do not mean that the state is inadvertently surrendering the authority to introduce specific regulation on specific topics, but rather that it is aware of the limitations of its own regulatory

510 Gunnar Folke Schuppert, *Was ist und wie misst man Wandel von Staatlichkeit?* [in:] "Der Staat" 3 (2008), p. 325–326.

511 Horst Dreier, *Informales Verwaltungshandeln,* "StWuStP" 4 (1993), p. 647–681. See in particular p. 658.

512 Udo di Fabio, *Der Verfassungsstaat in der Weltgesellschaft*, Mohr Siebeck, Tübingen 2001, p. 20–29.

513 Holger Tobias Weiß, *Gemeinschaftsrecht als Determinante staatlicher Informationstätigkeit,* "EuZW" 3 (2008), p. 74–79.

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functions when it comes to complex tasks and areas.[514] Thus, if the state functions not only as a coercive apparatus, but also as a force of law and order with extensive capabilities, then the changes that take place affect not only the specific legal framework or organizational structures of the state, but also the rules of administrative action.[515] This includes, for example, environmental protection[516] and spatial planning which, force the state to limit itself to issuing only broad, general regulations due to the pace of social change as well as the dynamics and complexity of economic processes. In both these cases, the law is no longer a closed and hermetic entity or a pre-cooked product of the political process that is ready for mechanical implementation, but the first phase of an overarching program that consists of stimulating socioeconomic processes.

Ultimately, this leads to a fundamental change in the perception of the role of the executive (administration) at the central levels of execution of tasks formulated by the state. The rigid toolbox of instruments in the form of orders, prohibitions, and command and control regulations is superseded (albeit not universally) by flexible policies and implementation strategies or the outright privatization of the implementation process and broader executive action.[517] The introduction of these privatization processes is hardly surprising in light of the greatly increased burden of duties that the state must take on, especially given that it relieves state of its responsibility to fulfill some of them effectively. This

514 Dominik Düsterhaus, *Nationalität – Mobilität – Territorialität. Gemeinschaftsrechtliche Ansprüche mobiler Unionsbürger gegen ihre Heimatstaaten,* "EuZW" 4 (2008), p. 103–107.

515 Sebastian Müller-Franken, *Maßvolles Verwalten*, Mohr Siebeck, Tübingen 2004, p. 19 n. and p. 46 n. See also: Matthias Jestaedt, *Maßstäbe des Verwaltungshandels* [in:] Dirk Ehlers / Hermann Pünder, *Allgemeines Verwaltungsrecht*, *op.cit.*, p. 325–326.

516 Hasso Hofmann, *Die Aufgaben des modernen Staates und der Umweltschutz* [in:] Michael Kloepfer (Hrsg.), *Umweltstaat*, Springer, Berlin 1989, p. 1–38. Relevant recent publications include: Reinhard Hendler, *Das Gesetz zur Einführung einer Strategischen Umweltprüfung,* "NVwZ" 9 (2005), p. 977–984; Alexander Schink, *Umweltprüfung für Pläne und Programme – Verfahrensanforderungen,* "NuR" 3 (2005), p. 143–151; Meinhard Schröder, *Postulate und Konzepte zur Durchsetzbarkeit und Durchsetzung der EG-Umweltpolitik,* "NVwZ" 4 (2006), p. 389–395; Walter Bückmann, *Der zweite Entwurf zur europäischen Bodenrahmenrichtlinie,* "UPR" 10 (2006), p. 365–374; Rasso Ludwig / Malte Petersen, *Aktuelle Fragen und Entwicklungen des europäischen Bodenschutzrechts,* "NuR" 7 (2007), p. 446–453; Mario Genth, *Ist das neue Umwelt-Rechtsbehelfsgesetz europarechtskonform?,* "NuR" 1 (2008), p. 28–32; Jochen Schumacher, *Umweltrechtsbehelfsgesetz,* "UPR" 1 (2008), p. 13–19; Annette Guckelberger, *Die EG-Verordnung zur Umsetzung der Aarhus-Konvention auf der Gemeinschaftsebene,* "NuR" 2 (2008), p. 78–87; Bernhard Wegener W., *Ist die Planung noch rationale? Europäisches Naturschutzrecht und nationale Infrastrukturentwicklung,* "ZUR" 5 (2010), p. 227–235; Malte Kohls, *Zulassung von Projekten in Natura-2000-Gebieten,* "NuR" 3 (2011), p. 161–167; Klaus Füßer / Marcus Lau, *Maßnahmenpools im europäischen Gebietsschutzrecht,* "NuR" 7 (2014), p. 453–463; Klaus Meßerschmidt, *Das Reservatsmanagement und seine habitatschutzrechtliche Privilege,* "NuR" 1 (2016), p. 21–30.

517 Martin Burgi, *Verwaltungsorganisationsrecht*, [in:] Dirk Ehlers / Hermann Pünder, *Allgemeines Verwaltungsrecht*, *op.cit.*, p. 319–323.

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kind of withdrawal of the state is not too problematic in the eyes of constitutional law or the theory of the state, as the exact range and scope of these duties cannot be specified due to the lack of a coherent body of research on the core duties of the state. Thus, the state's 'retreat' cannot be evaluated *a priori* as a violation of the constitutional order, let alone a violation of citizens' fundamental rights. On the contrary, one can posit that the deconcentration and erosion of the state's omnipotence translates into an expansion of civic freedoms. For this reason alone, it is a solution that is worthy of consideration.[518]

Privatization can only be analyzed in the broad sense of the term due to the rapid acceleration of technical and technological development in modern times. However, this leads to the emergence of institutions other than the democratically elected representation of the nation that, in one form or another, take the place of legislative bodies. The pace of development makes it impossible for a parliament to define or set standards or norms in all possible areas of state activity. At the same time, the delegation of such power to non-parliamentary bodies inevitably leads to the erosion of authority and legitimacy in the popularly sanctioned activities of the state. These include the adoption of standards developed outside the parliamentary process or their use in the state's everyday operations. Many times, the most important elements of state action are embedded not in the law, but in directives and operational regulations, or – on an even more granular level – in the countless circulars and guidelines that drive the enforcement of legal acts.

The privatization of state duties can also be analyzed in terms of entities associated with private law taking over and fulfilling duties that were previously public. However, the intensification of this process (particularly in the modern day) does not inexorably lead to any kind of 'surrender' or withdrawal of the state from its duties.[519] Leaving aside questions about the purpose this would serve and how effective it would be, it is notable that the notion of executive cooperation between the state and other entities is gradually paving its way into common practice. Furthermore, the state is no longer seen exclusively (or at least primarily) as a distributor of public goods or welfare. This is increasingly being replaced by the notion of the state as an entity whose main function is to regulate and – as a sign of the times – to provide remedy and restitution when the law is violated, rather than solely to ensure (re)distribution.[520] Thus, unless the tradi-

518 Maximilian Wallerath, *Der ökonomisierte Staat. Zum Wettstreit zwischen juridisch-politischem und ökonomischem Paradigma*, "JZ" 5 (2001), p. 209–218.

519 Reiner Schmidt, *Die Reform von Verwaltung und Verwaltungsrecht* [in:] "VerwArch" 2 (2000), p. 149–168, See in particular p. 166.

520 Judgment of the CJEU of 30 September 2003 – Case C-224/01 – Gerhard Köbler v. Republik Österreich, [2003] ECR 2003, I-10239. For more on this, see: Ulrich Haltern, *Verschiebungen im europäischen Rechtsschutzsystem*, "VerwArch" 3 (2005), p. 311–347; Carsten Kremer, *Effek-*

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tional model of exclusive fulfillment of public duties by the state takes hold or the privatization of those duties is maintained, the emergence of mixed forms of organization and ownership is a likely scenario, combining elements of state structures on the one hand and their operation in accordance with market rules on the other.

Thus, the model of hierarchically organized administration that prioritizes regulation and formal directives above all else is gradually giving way to entities managed and operated according to the laws of the market. Nevertheless, following Montesquieu's tripartite division of power, we can argue that a democratically legitimate legislative entity is one whose mandate to exercise power comes from the will of the voters. Butin this context, the European Union is emerging as another source of legal authority. This is part of a process that entails the creation of a new legal order that does not function alongside, but *above* national legislative authorities.[521] This is an important point to remember even if we ignore the fact that the principle of the primacy of EU law over national law adopted by the EU member states is what ultimately drives this process.

These considerations bring up another critical question: Who truly plays the role of lawmaker at the supranational, European level? However tempting it might be to respond with a superficial assessment, the reality is that addressing this question is not a simple task. If one thing is certain, it is that the European Parliament is not the correct answer. Despite its name, the EP does not fulfill the functions typically associated with parliamentary bodies. As Klaus von Beyme argues, a parliament in the proper sense of the term must be a representative body with unlimited authority to formulate and adopt laws.[522] This is certainly not the case for the European Parliament. Second, the European Parliament can hardly be seen as a representative institution given that its members are not elected under a uniform, cohesive electoral law in all member states.[523] Finally, unlike a traditional parliament, it does not wield the unfettered power to shape the budge of the European Union.

While we can confidently argue that the European Parliament does not possess the basic prerogatives of a legislature, the Council of the European Union has a much stronger claim. But here, too, there are limitations. The Council only

tuierung des europäischen Beihilferechts durch die Begrenzung der Rechtskraft, "EuZW" 23 (2007), p. 726–729.

521 Gertrude Lübbe-Wolf, *Europäisches und nationales Verfassungsrecht,* "VVDStRL" 60 (2001), p. 246.

522 Klaus von Beyme, *Der Gesetzgeber: Der Bundestag als Entscheidungszentrum*, Westdeutscher Verlag, Opladen 1997, p. 176.

523 Marietta Hovehne, *Ein demokratisches Verfahren für die Wahl zum europäischen Parlament: Legitimation gemeinschaftlicher Entscheidungsstrukturen im europäischen Integrationsprozeß*, Peter Lang, Frankfurt a.M. 1999, p. 163 n. and p. 224 n.

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becomes active if the European Commission exercises its right to initiate legislation – or rather its monopoly on doing so (barring the few restrictions that exist). Thus, by defining the Council and the Commission as the 'central bodies' of the European Union, we can assess that this inevitably leads to a confrontation between national executives and the two EU centers of power, given that the duties of national executive bodies indisputably encompass the implementation of *the acquis communautaire* into national law. The problem here is not the existence of a bipartite legislative authority, but the lack of a center that would provide the necessary coordination between them. To quote Peter M. Huber's ever-accurate assessment, this leads to a situation in which national law "transforms from a reliable instrument for controlling administrative action into an increasingly arbitrary generating device."[524]

The national lawmaking authority, whose central place is determined by the democratic constitutional order, is thus not only pushed to its fringes, but not even remotely replaced at the EU level by a legislative entity that is vetted and legitimized through a democratic process.[525] The severe impacts of this that national authorities have to consider are not limited to 'Europeanizing' changes to the content of national legislation or to the recasting of national law in accordance with EU law; the competence of controlling and possibly rejecting legal norms gains incredible importance.[526] Conversely, in the doctrine of German law, for instance, administrative authorities are not vested with this competence in either *lex generalis* or *lex specialis.* Thus, the administration cannot prevent a particular rule from being applied on the grounds of non-compliance with a higher standard in individual cases.

What complicates this situation is that, as we know, EU law (both primary and secondary) enjoys primacy over national law. This results not only in the loosening of ties with the national legislature and its operations, but also in a continuous need for interpretation.[527] The consequence of this need is that executive activity as a whole is severely delayed – a point that few researchers emphasize. Finally, giving priority to supranational law (as exemplified by European Union law) undermines existing national legal orders, in particular the gradual dynamics of the evolution of legal standards over the years. One succinct illus-

524 Peter M. Huber, *Die entfesselte Verwaltung,* "StWuStP" 4 (1997), p. 423–459. See in particular p. 444.

525 Armin von Bogdandy, *Gubernative Rechtsetzung: Eine Neubestimmung der Rechtsetzung und des Regierungssystems unter dem Grundgesetz in der Perspektive gemeineuropäischer Dogmatik*, Mohr Siebeck, Tübingen 2000, p. 491.

526 Ralf M. Kanitz / Matthias Wedel, *Gemeinschaftsrechtlich gebotene Grenzen der Bestandskraftdurchbrechung im europäisierten Verwaltungsverfahren?,* "EuZW" 8 (2008), p. 231–235.

527 Friedrich Schoch, *Die Europäisierung des Allgemeinen Verwaltungsrechts,* "JZ" 3 (1995), p. 109–123; See in particular p. 111.

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tration of this is that a procedural principle of German administrative law, which states that an administrative act should be suspended when it faces a specific kind of objection,[528] is not applicable[529] according to the case law of the Court of Justice of the EU.[530] In light of this, one can argue that the Europeanization of administrative law translates into the instrumentalization of said law. That is, national administrative law is used to facilitate the administrative implementation of EU law. The consequences of this process are diverse and profound, as described above.

5. General principles of EU environmental law

Under the EU's environmental policy, Article 191(1) TFEU outlines both objectives and outcomes; Paragraph 2 of the same article describes the means by which these objectives are to be achieved.[531] This is a rather unusual approach in the context of EU law. While other EU policies also tend to clearly spell out their objectives, this does not usually come coupled with a mandate to shape a particular area of EU policy through specific implementation guidelines.[532] It goes without saying that this situation compels national legislatures to modify their own legal order. This response can take the conventional form of adopting appropriate legal changes, but it can also be the result of cooperation – at both the EU and national level. The lack of fully developed rules of cooperation between member states and the European Union does not diminish the importance of the cooperation formula under Article 267 TFEU. Indeed, across the entire policy system of the EU, nowhere does cooperation feature as strongly as it does in the case of environmental protection and the EU rules that govern it.

528 Pursuant to § 80 section 1 of the Code of Administrative Court Procedure (VwGO).

529 Pursuant to § 80 section 2 sentence 1 number 4 of the Code of Administrative Court Procedure (VwGO). For more on this topic, see: Klaus Stern, *Die Erweiterung des europäischen Gemeinschaftsrechts auf die Verwaltungsgerichtbarkeit,* "JuS" 9 (1998), p. 769–776, in particular p. 775; Alexander Jannasch, *Einwirkungen des Gemeinschaftsrechts auf den vorläufigen Rechtsschutz,* "NVwZ" 5 (1999), p. 495–502, in particular p. 496.

530 Judgment of the CJEU of 10 July 1990 – Case C-217/88 – Commission of the European Communities v. Federal Republic of Germany [in:] ECR 1990, I-2879. For more on this topic, see: Friedrich Schoch, *Die Europäisierung des verwaltungsrechtlichen Rechtsschutzes*, De Gruyter, Berlin–New York 2000, p. 31; Dieter H. Scheuing, *Rechtsprechungsanalyse: Europäisierung des Verwaltungsrechts,* "Die Verwaltung" 1 (2001), p. 107–143.

531 On the difference between objectives and the principles of their implementation, see Martin Burgi, *Das Schutz- und Ursprungsprinzip im europäischen Umweltrecht,* "NuR" 1 (1995), p. 11–15. See in particular p. 13.

532 Ludwig Krämer, *Das Verursacherprinzip im Gemeinschaftsrecht. Zur Auslegung von Artikel 130r EWG-Vertrag,* "EuGRZ" 15/16 (1989), p. 353–361. See in particular p. 356.

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5.1 The high level of protection principle

One of the starting points in the analysis of EU environmental policy – and more specifically of how the EU's lawmaking bodies understand the standards that it introduced – is a set of two regulations in the Treaty on the Functioning of the European Union. The first, Article 114(3) TFEU, requires the Commission to incorporate a "high level" of environmental protection into all its proposals for the creation of a stable and functional the internal market (per Article 114(1) TFEU). The Council and the European Parliament are expected to follow a similar principle.

The first sentence of the second regulation – Article 191(2) TFEU – states in broad terms that EU environmental policy aims to ensure (maintain) a "high level of protection," taking into account the different conditions that exist in the various regions of the European Union. Combining these two provisions, we can argue that, within their scope of application, they jointly contain a legal obligation whose infringement can lead either to either formal allegations relating to the violation of EU law or the annulment of the act in question.[533] Nevertheless, the term "high level of protection" does not necessarily mean "the highest level of protection," which of course considerably widens the margin of what is necessary, needed, or possible when the interests of the environment are weighed against the economic and political situation of each member state and its administrative units.

The integration clause in Article 11 TFEU argues in favor of the interpretation that the first sentence of Article 191(2) EC can be regarded as a general principle of operation, both in relation to other Union regulations that are in force and to the bodies of the European Union that apply them. In other words, all EU environmental legislation must adopt as its starting point the provision of a high level of environmental protection, while the authorities applying it are obliged to take this legal baseline into account.[534] In accordance with Article 11 of the TFEU, it is necessary to take environmental protection requirements into account when implementing other EU policies.

The blurred boundaries of "a high level of protection" are not made clearer by the need to take into account "the diversity of situations in the various regions of the Union" (Article 191(2)(1) TFEU). If consideration the specific circumstances in the regions in question serves as a *sine qua non*condition for the development and deployment of EU environmental policy under Article 191(3) TFEU (second indent), then the first sentence of Article 191(2) TFEU can only be taken to mean

533 Judgment of the CJEU of 14 July 1998 – Case C-284/95 – Safety Hitech Srl v. S. & T. Srl [in:] ECR 1998, I-4301.

534 Astrid Epiney, *Umweltrecht der Europäischen Union*, *op.cit.*, p. 154.

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that the definition of a "high level of protection" depends on the underlying circumstances in those regions. Thus, the concept of a "high level of protection" is not absolute, but rather relative. Put differently, the situation in any given region determines how environmental protection in that region compares to the average "high level" and becomes a yardstick for higher or lower levels of protection.[535]

The recognition and inclusion of different conditions in individual regions of the European Union as a component of how environmental protection is understood leads us to conclude that the term *environment* in EU jurisprudence is underpinned by local rather than universal factors. Moreover, the quality of the environment, as defined, can only be assessed in the context of a specific situation, time, and space. However, this relativity does not mean that states and regions can circumvent EU regulations and requirements with impunity. This would only be possible if we were to adopt a bizarre interpretation of the first sentence of Article 191(2) TFEU in the spirit of lowering environmental standards. While this would be much more straightforward and potentially more attractive than meeting the high expectations of the European Union with regard to the environment, this interpretation has had no credible uptake.

5.2 The precaution and prevention principles

The second sentence of Article 191(2) TFEU leaves no doubt as to the interpretation of Article 191(2) TFEU: EU environmental policy should also respect the principles of prevention and care for the environment.[536] The basis for adopting this approach is the conviction that potential environmental damage should be addressed proactively by means of preventive measures. In other words, it's better to nip problems in the bud rather than worry about how to fix them later. The distinction between prevention and care, which was not recognized by the Court of Justice of the EU,[537] also allows for preventive action to be

535 *Ibidem*, p. 155.

536 Christian Calliess, *Zur Maßstabswirkung des Vorsorgeprinzips im Recht,* "VerwArch" 3 (2003), p. 389–418.

537 The CJEU formulates the precautionary principle (without distinguishing between prevention and care) as follows: "(…) it is for the Community and the Member States to prevent, reduce and, in so far as is possible, eliminate from the outset, the sources of pollution or nuisance by adopting measures of a nature such as to eliminate recognised risks." CJEU judgment of 5 October 1999 – Cases C 175/98 (Paolo Lirussi) and C 177/98 (Francesca Bizarro) (joined cases) [in:] ECR 1999, I-6881, no. 51. See also: CJEU judgment of 22 June 2000 – Case C 318/98 – Criminal proceedings against Giancarlo Fornasar, Andrea Strizzolo, Giancarlo Toso, Lucio Mucchino, Enzo Peressutti and Sante Chiarcosso [in:] ECR 2000, I-4785.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

taken under the broad interpretation of care even when such (potential) threats may already be emerging.

The principle of prevention follows a somewhat different line of thinking. Here, the measures that are adopted do not target potential threats, but practical ones that already exist. Therefore, since the principle of care also encompasses preventive measures to respond to such a threat, it constitutes a broader concept than the principle of prevention.[538] Bearing in mind that the principle of care is itself encumbered with at least some ambiguity,[539]we can distinguish two areas of contention in the analysis of this principle:

- The first is the lowering of the threshold for when preventive EU measures can be used,
- The second is the excessive reduction of the principle of care to its preventive aspect.

Although historical experience shows us that it is particularly dangerous to refer to the public interest when it is dressed in the ideological garlands of the highest human virtues, the idea that one can overlook individual grievances in the name of pursuing the community's collective values has gained a strong foothold in environmental protection. Appealing to the general public is often regarded as sufficient reason to infringe upon the interests of private parties. However, those interests are just that – interests, not rights. The principle of proportionality – which requires the measures adopted to be aligned with the degree and nature of the threat – provides a buffer that effectively protects against the infringement of these rights on the pretext that only the individual interest of a party is infringed.

While at first glance one may be convinced that this principle is effective,[540] this does not fully bear out in practice. Even if we consider the CJEU ruling[541] relevant and applicable to environmental protection, both the scope of the principle and the instruments associated with its implementation remain unclear.[542] However, interpreting the principle of care only in terms of applying

538 Gertrude Lübbe-Wolff, *IVU-Richtlinie und Europäisches Vorsorgeprinzip,* "NVwZ" 8 (1998), p. 777–785.

539 Ivo Appel, *Europas Sorge um die Vorsorge. Zur Mitteilung der Europäischen Kommission über die Anwendbarkeit des Vorsorgeprinzips,* "NVwZ" 4 (2001), p. 395–398.

540 Werner Schroeder, *Die Sicherung eines hohen Schutzniveaus für Gesundheits-, Umwelt- und Verbraucherschutz im europäischen Binnenmarkt,* "DVBl." 4 (2002), p. 217.

541 In this ruling, informally called the 'BSE ruling,' we read, among others, that: "In view of the great uncertainty as to the risks posed by the animals and products concerned, to take the protective measures in issue without having to wait until the reality and seriousness of those risks became fully apparent." [in:] Judgment of the CJEU of 5 May 1998 – Case C-180/96 – United Kingdom of Great Britain and Northern Ireland v. Commission of the European Communities [in:] ECR 1998, I-2265, no. 90.

542 Dieter H. Scheuing, *Instrumente zur Durchführung des Europäischen Umweltrechts,* "NVwZ" 5 (1999), p. 475–485.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

preventive measures paints a different picture and leads to different conclusions. This approach essentially waters down the principle and strips away its potency. The conceptual value of care for the environment lies in the fact that preemptive preparatory measures are a necessary supplement to conventional preventive measures, even if the latter are multifaceted and comprehensive. The main objective of such care is to maintain a balance between the exploitation and protection of the human environment – and thus minimize possible damage.[543]

5.3 The rectification at source principle

Here too, the second sentence of Article 191(2) TFEU is the starting point. Following this article, implementing the rectification at source principle must factor in questions of place and time, but most of all the way in which a given threat or kind of environmental damage is removed. This article leaves little doubt in this respect: EU law expects that risks and damage will be eliminated in the place where they arise. Importantly, this should be done as soon as possible.[544] However, the simplicity of this interpretation can be misleading. If the aim of such a principle was only to achieve a state of ecological equilibrium or to secure the safety of the environment, it would be a duplication of the principle of prevention and care. However, while the latter rule merely states what conditions must be met in order for a particular preventive measure to be applied (or what conditions should have been met), the principle of rectification at source also states when and where the measure can or must be applied.[545] Naturally, in both cases, the principle of proportionality, as outlined above, must be taken into account.

5.4 The polluter pays principle: Responsibility at the source

Another part of the second sentence of Article 191(2) TFEU tackles not so much the degree of responsibility of the perpetrator, but the link between environmental damage (whether intentional or not) and the need for financial compensation. The latter is understood as either financial measures to either reduce the magnitude of the resulting environmental threat/damage or remove the resulting effects. This solution differs from the others because it rejects the so-

543 Astrid Epiney, *Umweltrecht der Europäischen Union*, *op.cit.*, p. 161.
544 Stefan Schmitz, *Die Europäische Union als Umweltunion*, Rhombos, Berlin 1996, p. 160.
545 Martin Burgi, *Das Schutz- und Ursprungsprinzip im europäischen Umweltrecht*, *op.cit.*, p. 11–15.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

called principle of cost-sharing with regard to environmental damage, according to which dealing with the consequences of such damage is the responsibility of all of society, i. e. all taxpayers.[546]

If we take a closer look at the financial side of the polluter pays principle, we can also argue that this principle requires the internalization of external (ecological) costs. Secondly, the increased cost of the implementation process has an inhibiting impact on environmentally harmful behavior. The polluter pays principle is thus transformed from a classic (political) legal instrument into a typical economic tool. Although this transformation is not in itself problematic, it is difficult to generate an appropriate estimate of penalties to account for the cost of environmental damage that would satisfy both environmental stakeholders and those interested in the economic exploitation of the environment.[547]

5.5 The principle of sustainable development

The principle of sustainable development (Article 3(3) TEU, second sentence, and Article 3(5) TEU, second sentence) is one of the six canonically established environmental protection principles of the EU – and arguably the most important one. It is certainly the most characteristic principle and the one that arises most frequently in contemporary public debate. Sustainable development policy currently applies to the kind of human activity that, while furthering the goal of achieving economic development, can only be conducted within the limits stipulated by scarce natural resources. The novelty of this approach is that the European Union not only acknowledges its respect for sustainable development in international relations, but also considers it necessary to contribute to the "sustainable development of the Earth" (Article 3(5) TEU, second sentence).

The inclusion of the principle of sustainable development in the Treaties also allows us to posit that the European Union's environmental policy aims to be guided by this principle, even though it does not appear again in Article 191 TFEU. However, the exact legal obligation that this creates in the context of EU environmental policy is not entirely clear, primarily because it is uncertain whether the principle can be framed as a true obligation that takes into account the welfare of current and future generations on the one hand, and the need for socio-economic development on the other. The alternative interpretation is

546 Johannes Caspar, *Europäisches und nationales Umweltverfassungsrecht* [in:] Hans-Joachim Koch (ed.), *Umweltrecht*, Vahlen, Köln–Berlin–München 2007, p. 53.

547 *Ibidem.*

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narrower, i. e. that the sustainable development principle should be applied primarily to environmental protection.[548]

A review of EU law allows us to more readily apply the principle of sustainable development to environmental law. Although the Treaty objectives are rather sparse and scattered in this respect, the integration clause (Article 11 TFEU) suggests that, if sustainability is to be understood as an objective, its ultimate goal is to ensure a proper place for ecology in the hierarchy of public affairs for the benefit of future generations. This interpretation is supported by the fact that the integration clause explicitly requires the incorporation of environmental protection requirements into all EU policies and activities "with a view to promoting sustainable development" (Article 11 TFEU). If instead the EU lawmaking bodies had set out to provide equal treatment to environmental objectives and socioeconomic development, we would have to assume that the obligation to respect the environment in other EU policies under the integration clause is relative.[549] In short, social, economic, and political considerations would be of equal importance when applying the integration clause.

The fact that this is not the case proves that economic and social objectives are subject to separate regulations in the Treaties. It would thus be inconsistent and inaccurate to view them as part of the objective of achieving sustainable development as set out in the Treaties. Still, the Union's policies are predicated on the separation of environmental considerations from socioeconomic considerations, rather than on prioritizing one over the other or placing socioeconomic issues in a lower tier. At the same time, this approach allows us to clearly grasp the concept of sustainable development, and even to define it as a natural process of development that takes place in accordance with environmental law.[550] The environmental principles contained in the second sentence of Article 191(2) TFEU can be understood as a way to operationalize and bring to life the sustainable development principle.

5.6 The integration clause

The adoption of the integration clause (Article 11 TFEU) as another principle supporting the universe of rules guiding the EU's environmental action does not require much additional commentary.[551] It would suffice to point out that, in

548 Katja Gehne, *Nachhaltige Entwicklung als Rechtsprinzip. Normativer Aussage alt, rechtstheoretische Einordnung, Funktionen im Recht*, Mohr Siebeck, Tübingen 2011, p. 11 n.

549 Astrid Epiney, *Umweltrecht der Europäischen Union*, *op.cit.*, p. 171.

550 *Ibidem*, p. 172.

551 Christian Calliess, *Die neue Querschnittsklausel des Art. 6 ex 3c EGV als Instrument zur Umsetzung des Grundsatzes der nachhaltigen Entwicklung*, "DVBl." 11 (1998), p. 559–568.

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order to be effective, environmental policy cannot be practiced in a way that is isolated from other European Union policies (actions). In brief, it must take into account the actions of others, but also be taken into account by others. The importance of the clause does not derive from its inclusion in Article 11 of Title II TFEU, nor from the addition of a clarification on the need for the European Union to take sustainable development into account when defining and implementing its policies and activities. It is much more important to highlight the implicit causal link between the implementation of environmental policy by member states and the need for member states observe the integration clause.[552] If we recall that environmental policy falls within the executive purview of the member states, it is natural that other policies must also be taken into account. Their proper coordination and coherence can only be ensured by respecting the integration clause, whose growing importance in the Union's activities is best demonstrated by its inclusion in other Union policies.[553]

6. Environmental protection in the EU: Balancing guidelines with sensible public goods

The cross-cutting nature of environmental protection compels the European Union to pursue a coherent policy to the extent that either Treaty rules or the principle of proportionality allows it. But the integral nature of environmental protection also stems from Article 114 TFEU, which stipulates that the member states should seek to harmonize their respective legal systems. There is no doubt that the integration clause in Article 11 TFEU significantly facilitates this process, as it brings together policies as diverse as agriculture, industry, communication and transport, energy, research, education, and tourism.[554] Yet it is (still) difficult to precisely define the legal scope of Article 11 TFEU. Some of the reasons for this are outlined below.

First, let us consider the applicability of the integration clause across policy domains. The Treaties defined it in very broad terms, which allows us to frame this clause not as an instrument that is limited to the areas defined in the Treaties, but as a principle that covers all EU action. Nevertheless, it remains unclear whether the obligation to act under Article 11 TFEU refers (only) to the shaping

552 *Ibidem*, p. 564.

553 These are: Article 8 TFEU (equality between men and women); Article 9 TFEU (social protection); Article 10 TFEU (combating discrimination); Article 12 TFEU (consumer protection); Article 13 TFEU (animal protection); Article 168(1) TFEU (health), and Article 208(1) TFEU (development cooperation).

554 Johannes Caspar, *Europäisches und nationales Umweltverfassungsrecht*, *op.cit.*, p. 53.

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of a given EU policy, or whether it also applies to specific EU measures.[555] Although EU legal doctrine does not provide a clear answer, it is clear that applying it to individual measures cannot be understood as a requirement to refer to environmental protection in every single case. Such an interpretation would imply that other measures are free from this obligation.

Another interpretation is that, as a rule, the activities of the Union must consider factor in environmental protection requirements. Whether this always takes place under the same legal act remains immaterial to achieving the objective of environmental protection. Thus, we can conclude that Article 11 TFEU's reference to "the Union's policies and activities" can only be taken to mean that no EU activities can be undertaken unless environmental protection requirements are taken into account. If interpreting Article 11 TFEU is difficult due to the uncertain scope of applicability of the horizontal clause, the second challenge is the need for broader reference points. From both a systemic and teleological perspective, we can state that the requirements of environmental protection should be as broadly defined as possible when applying the integration clause so that they can be fully synchronized with the EU's broader environmental policy under Article 191 TFEU.[556]

This last point is critical because isolating individual aspects of environmental protection would inevitably lead to a distorted picture of the relationship between the need to protect the environment and the need to exploit it for the betterment of the economy. While individual classifications allow us to pinpoint the different ways in which environmental protection is perceived, the teleological interpretation of the horizontal clause suggests that emphasizing the causal link between Article 191 TFEU and other articles of the same Treaty is neither artificial nor accidental. Otherwise, the expectations defined by the EU lawmaking bodies with regard to its environmental policy would amount to nothing more than a storehouse for noble slogans and appeals. The EU requirement to incorporate action to support the Union's sustainable development policy proves that this is not the case. Therefore, the integration clause can be treated as a vehicle for transferring the principle of sustainable development to other EU policies – much more so than any other provision.[557]

However, this does not provide us with sufficient guidance as to what weight can or should be attributed to particular environmental requirements. Although the integration clause allows us to assume that the emphasis on environmental issues is reflected in the action of the European Union, this is not tantamount to

555 Christian Calliess, *Die neue Querschnittsklausel des Art. 6 ex 3c EGV als Instrument zur Umsetzung des Grundsatzes der nachhaltigen Entwicklung*, *op.cit.*, p. 566.
556 Astrid Epiney, *Umweltrecht der Europäischen Union*, *op.cit.*, p. 175.
557 *Ibidem*, p. 175–176.

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saying that the integration clause gives these issues primacy over all others. In fact, the structure and design of the Treaties themselves negate this, as their underlying rule is that the Union pursues its various policies in parallel. At most, this means that the application of the integration clause, within the meaning of Article 11 TFEU, requires that environmental issues should form a core component of any and all EU activities. However, the article does not say anything about how and in what proportions this is to be carried out, and therefore no hierarchy of objectives can be derived from the application of the horizontal clause. Thus, environmental protection requirements and objectives must be taken into account separately for each individual Union policy (action).

At the same time, the integration clause requires the parties to take appropriate measures to address environmental protection requirements across into account all domains of EU policy and action.[558] It is essential to note that Article 191(3) TFEU contains a set of guidelines or criteria for balancing conflicting laws (interests) that must be taken into account in EU environmental policy. These include available scientific and technical data (first indent), environmental conditions in the various regions of the Union (second indent), the potential benefits and costs of action or lack of action (third indent), and the economic and social development of the Union as a whole as well as the balanced development of its regions (fourth indent). Since these criteria are only should only be "taken account of" in the development of the Union's environmental policy, they are not a vital precondition for any given action on the part of the EU. Moreover, they do not affect either the shape or the scope of the EU's competences.

However, this assertion is a bit misleading. Article 191(3) TFEU clearly indicates its status as a legally binding regulation.[559] Nevertheless, the substance of Article 191(3) TFEU is limited, as the EU considers the aforementioned aspects even if this does not lead to any empirically demonstrable effect. This triggers the need to incorporate the principle of balancing conflicting legal interests, both in the course of implementing a policy or action and in addressing the effects of the law.[560] Since these criteria and the resulting balancing requirement only provide a very limited idea of the outer bounds of legislation and the limits of legality, any infringement would be very difficult to prove.

558 Martin Wasmeier, *Die Integration des Umweltschutzes als allgemeine Auslegungsregel des Gemeinschaftsrechts. Das EuGH-Urteil vom 10. 6. 1999 – Rs. C-346/97, Braathens Sverige AB (Transwede Airways), EWS 1999, 354,* "EWS" 2 (2000), p. 47–52.

559 Rudolf Streinz, *Europarecht*, *op.cit.*, Rdnr. 1211–1213, p. 489.

560 Astrid Epiney, *Umweltrecht der Europäischen Union*, *op.cit.*, p. 180.

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However, if a legal act were to be found in violation of Article 191(3) TFEU, the only solution would be to declare the act null and void.[561] This would show that the provision, as presented, is binding in nature. This is true irrespective of the lack of substantive precision in the article and the broad discretion available to EU bodies in these matters. Similarly, we must reject the argument that the provisions of Article 191(1) – (3) TFEU do not have the characteristics of mathematical formulae, as this does not alter their legal and binding nature.[562] It is thus abundantly clear that the need to interpret a given norm has nothing to do with its legal validity. It is also worth noting that questions about the relationship between interpretation and validity arise in the case of norms that are constructed conditionally or in their final form. This undoubtedly applies to the principles analyzed here, even if the desired solution cannot always be provided.[563]

A completely different meaning should be attributed to the principles contained in Article 191(2) TFEU when they are viewed as underpinning for the legitimacy of Union activities. Since EU secondary legislation can be developed on the basis of Treaty law, these principles should be seen as providing specific directions to any given action, procedure, or activity within the European Union. The caveat is that the term 'specific direction' should not be interpreted as prescriptive. The concept of the "principle of the best possible environmental protection", as formulated by Martin Zuleeg during the debates on the final form of the Single European Act, continues to be relevant today.[564] If one understands the rules adopted in the Lisbon Treaty revision (i. e. Article 11; Article 114(3), (4); Article 191(2) and Article 193 TFEU) as vehicles for enabling the best possible protection of the environment, this subset of primary EU law should be viewed as a set of rules, per Zuleega's definition.[565]

On the other hand, it is important to remain aware of critical voices and recognize their arguments. For instance, some rightly claim that while the essence of the principle can be derived from treaty regulations, this does not provide a truly conclusive and unambiguous interpretation. Furthermore, there

561 Judgment of the CJEU of 14 July 1998 – Case C-284/95 – Safety Hitech Srl v. S. & T. Srl [in:] ECR 1998, I-4301.

562 Ivo Appel, *Europas Sorge um die Vorsorge. Zur Mitteilung der Europäischen Kommission über die Anwendbarkeit des Vorsorgeprinzips*, *op.cit.*, p. 395.

563 Gerd Winter, *Umweltrechtliche Prinzipien des Gemeinschaftsrechts,* "ZUR" Sonderheft (2003), p. 139.

564 Martin Zuleeg, *Vorbehaltene Kompetenzen der Mitgliedstaaten der Europäischen Gemeinschaft auf dem Gebiete des Umweltschutzes,* "NVwZ" 4 (1987), p. 280–286.

565 Astrid Epiney, *Die umweltpolitischen Handlungsprinzipien in Art. 130r EGV: politische Leitlinien oder rechtsverbindliche Vorgaben? Zu den Urteilen des EuGH in den Rs. C-284/95, C-341/95 (Safety Hi-Tech) vom 14. 7. 1998,* "NuR" 4 (1999), p. 181–185; Alexander Jannasch, *Einwirkungen des Gemeinschaftsrechts auf den vorläufigen Rechtsschutz*, *op.cit.*, p. 495–502.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

are no reference points in the case law of the EU Court of Justice. Even the most exhaustive scholarly discussions will not change this, and those discussions are conducted almost exclusively in the German literature on the subject.[566] That being said, the considerations presented here, however important, cannot and should not overshadow a much more important issue, namely the implementation of EU environmental law.[567] We know that the incorporation of this body of law into national jurisprudence is often (heavily) delayed, sometimes incomplete, and sometimes simply botched.[568] The only surprise is that these challenges arise regardless of the political system in place in a given member state, the structure of power within it, and the opportunities and capabilities of its administration.[569]

566 Astrid Epiney, *Umweltrecht der Europäischen Union*, *op.cit.*, p. 188–189. See also additional examples provide by Epiney.

567 Silke Albin, *Zwangsgelder, Mittelkürzung und Umweltinspektionen – Neueste Entwicklungen bei der Vollzugskontrolle von EU-Umweltrecht,* "DVBl. " 20 (2000), p. 1483–1492.

568 Horst Sendler, *Deutsche Schwierigkeiten mit dem EG-Recht. Zur Misere der Umsetzung von EG-Umweltschutz-Richtlinien,* "NJW" 39 (2000), p. 2871–2872; Eckard Rehbinder / Rainer Wahl, *Kompetenungsprobleme bei der Umsetzung von europäischen Richtlinien,* "NVwZ" 1 (2002), p. 21–28; Andreas Fisahn, *Probleme der Umsetzung von EU- Richtlinien im Bundesstaat,* "DÖV" 6 (2002), p. 239–246.

569 Jan W. Tkaczyński, *Prawo i polityka ochrony środowiska środowiska Unii Europejskiej*, *op.cit.*, p. 57.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

Chapter 6. The universalization of EU environmental policy models: The case of China

Environmental policy is one of those few areas of EU policy that are not directly linked to the financial support of a Member State by the EU – as is the case, for example, with regional and agricultural policy or governance of the labor market. This is because EU environment policy is based on the understanding that the way in which natural resources are managed and exploited today must be closely linked to the management options that will be available to future generations. It also stems from the awareness that environmental policy does not stop at addressing current environmental impacts. At the same time, this policy approach enables us to better understand why environmental protection in the EU is primarily a legal and organizational instrument rather than a financial one, and why not all policy actions have been allocated a source of funding. Today, it is undeniable that the EU's environmental policy, which is one of the Union's main areas of activity, is simultaneously a point of reference and a benchmark for other EU policies. But its importance goes beyond that. It is also a flagship *made in Europe* policy whose weight is intended to effectively prevent countries all over the world from engaging in unfair environmental competition practices. In short, it is supposed to effectively counteract the rejection of responsibility for both the present and the future state of the environment in the international arena.

1. Environmental protection as a component of EU policy

Like other EU policies, environmental policy is expressed in a complex (phased) cycle of activities that begins with identifying of the problem, through the process of its implementation, to controlling the intended effects of the implemented projects.[570] However, the actors who create the policy are just as important as the substance of the policy itself. Currently, all EU policies are an arena of cooper-

570 Ewa Mazur-Wierzbicka, *Ochrona środowiska a integracja europejska, doświadczenia polskie*, Difin, Warszawa 2012, p. 83.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

ation among an increasing number of actors whose interest, not surprisingly, often diverge. In the case of environmental protection policy, the actors whose activities contribute meaningfully to its furtherance include not only individual EU institutions, but also other entities independent of them. The list of these entities is extensive, encompassing the European Commission, the European Parliament, the Council of the European Union, the European Council, the Court of Justice of the EU, the Member States, as well as political organizations, non-governmental organizations (NGOs), various pressure (lobbying) groups, and even individuals.[571]

From a methodological standpoint, defining the scope of a given policy involves first recognizing that the need for said policy derives from the specific problems at hand that require the adoption of a specific strategy or means of resolution. For EU policies, the scope of other policies must be taken into account. Without entering into detailed theoretical considerations on the subject of environmental policy, this policy domain can be limited to protecting the elements that make up the concept of the environment. Despite the lack of a definition for the term 'environment' in EU primary law, we can posit that it consists of the following elements: humans, animals, plants, soils and subsoils, water, air, climate, biotopes and all ecological systems, environment and landscape, peace and quiet, natural fragrances, and cultural assets.[572] It is worth noting at this point that, in EU law, the term 'environment' is understood not only as the natural environment itself, but also the environment transformed or created by human activity.

The considerations above allow us to define environmental policy as a series of multifaceted activities whose specific, synoptic approach derives from their overlap with other EU policies. In accordance with the so-called integration principle, which is analyzed elsewhere in this manuscript, the importance of environmental policy cannot be reduced to sector-specific policies in isolation from other EU policies. Relying on such a sectoral approach would mean, for instance, focusing on investment processes that presuppose a high level of environmental protection within a given sector, which is a significant and unjustified simplification of the scope of such policies. However, EU politics and

571 *Ibidem.*

572 Jan W. Tkaczyński, *Prawo i polityka ochrony środowiska naturalnego Unii Europejskiej*, Wydawnictwo Naukowe PWN, Warszawa 2009, p. 20–21; Janina Ciechanowicz-McLean / Zbigniew Bukowski / Bartosz Rakoczy, *Prawo ochrony środowiska: Komentarz*, LexisNexis, Warszawa 2008, p. 44–47. Certain concepts related to the environment were defined in secondary legislation, such as: Article 3 of Council Directive 85/337 of 27 June 1985 on the assessment of the effects of certain public and private projects on the environment [in:] OJEU L 175, 5. 07. 1985, p. 40; Article 2.1a of Directive 2003/4 of the European Parliament and of the Council of 28 January 2003 on public access to environmental information and repealing Council Directive 90/313 [in:] OJEU L 41, 14. 02. 2003, p. 26.

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policies are evolving in a different direction by influencing other policies that must reflect environmental components. This has been exemplified in recent years by the implementation of the Europe 2020 Strategy, which demonstrates how much importance environmental protection has taken on in the EU's overall activities.[573]

It is beyond dispute that the shape of EU environmental policy also stems from the objectives of the multinational structure as a whole. This is because, in addition to pursuing economic objectives (e. g., economic growth) and social objectives (e. g., full employment), the EU also strives to achieve the environmental goals that stem from Article 3(3) of the Treaty on the European Union: *the Union shall work for the sustainable development of Europe based on* (…) *a high level of protection and improvement of the quality of the environment.* Thus, it is no coincidence that, over the last 30 years, environment policy has become the fastest growing area of cooperation between EU member states. Since EU environment policy is primarily (but not exclusively) predicated on a set of legal instruments, different solutions – including changes and reforms that result from the EU's policy objectives and are subsequently reflected in specific legal measures – are meant to be based on quantifiable scientific evidence.

When undertaking legislative action in the field of environmental protection, the EU institutions are obliged to make changes based on scientific facts. Hence, they indirectly apply the principle of prevention and care for the state of the environment to those cases in which the actual impact of a given substance on the environment is uncertain. This is particularly apparent when science cannot definitively determine that impact and yet there is a risk of causing significant environmental damage.[574] This approach is anchored in the idea that potential environmental damage should be addressed with preemptive measures. In other words, it is better to prevent environmental damage than to repair it. The distinction between prevention and mitigation, which the Court of Justice of the European Union (CJEU) did not remark upon, also allows some forms of preventive action to be taken in the latter case, even when such (potential) threats may already be occurring.[575]

573 Europe 2020: A strategy for smart, sustainable and inclusive growth [in:] COM(2010) 2020 final, March 3, 2010.

574 Christian Calliess, *Zur Maßstabswirkung des Vorsorgeprinzips im Recht,* "VerwArch" 3 (2003), p. 389–418.

575 The CJEU formulates the principle of prevention (without distinction between prevention and mitigation) as follows: "(…) it is the responsibility of the Community and the Member States to take the appropriate steps to eliminate known risks, to prevent, mitigate and, as far as possible, neutralise ecological harms on the ground" [in:] Judgment of the CJEU of 5 October 1999 – C 175/98 (Paolo Lirussi) and C 177/98 (Francesca Bizarro) (joined cases) [in:] ECR 1999, I-6881, no. 51; similarly, in the ruling of 22 June 2000 – C 318/98 (Giancarlo Fornasar and others) [in:] ECR 2000, I-4785.

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Thus, an important factor in applying the precautionary principle in environmental policy is reliance on scientific knowledge, which allows us to answer the question of whether the potentially harmful effects of a substance on the environment and human health, as well as on animals and plants, are likely to jeopardize the high level of protection that the EC is supposed to provide.[576] However, basing environmental policy actions on scientific data is not enough. In each case, the distinct underlying environmental conditions in the EU region in question should be taken into account. Furthermore, when making decisions based on a cost-benefit analysis (of both action and failure to act), it is useful to consider the impact of environmental policy on the socio-economic development of the Union as a whole and the sustainable development of its regions (Article 191(3) TFEU).

This last consideration is critical in determining the evolutionary direction of environmental policy in the EU, which is subject to lobbying by both advocates and opponents of strong environmental protection.[577] Therefore, in trying to draw up the balance sheet of a country's participation in environmental policy, one should first consider the effectiveness of the policy in general. The question of how environmental policy should be conducted is still relevant if one examines the environmental problems that, in different ways, characterize the almost 300 regions of the EU. Another open question is how to reconcile the EU's tasks when it comes to improving environmental conditions on the one hand with taking stock of local conditions in these regions on the other. One should not overlook that non-EU players are also involved in the policy-making process – players whose entanglement and role in various dependencies is not clear and does not necessarily translate into tangible results in the area of environmental protection.[578]

A deep dive into the behavior of individual EU member states also reveals that, while participation in environmental policy means implementing certain standards, it also encounters many difficulties, many of which are political rather than solely administrative. As previously indicated here, EU environmental policy is primarily a legal instrument; therefore, a high level of harmonization of legislation that is in force in the Member States with EU legislation is one of the elements that determine its effectiveness and efficiency. However, this is not a straightforward process, as is illustrated by the use of the so-called safeguard

576 Communication from the Commission on the precautionary principle [in:] COM(2000) 1 final, February 2, 2000, p. 8–10.

577 The activities of extremist environmental organizations are one example, cf. Elżbieta Posłuszna, *Ekstremizm ekologiczny: Źródła, przejawy, perspektywy*, Scholar, Warszawa 2012, p. 152–199.

578 Alicja Lisowska, *Polityka ochrony środowiska Unii Europejskiej: Podstawy instytucjonalne i programowe*, Wydawnictwo Uniwersytetu Wrocławskiego, Wrocław 2005, p. 211–216.

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clause (Article 114(4) TFEU). The clause is the basis for and namesake of a derogation that that allows member states to partially suppress the letter of EU law – or, to be even more precise, exempts a country from applying existing EU law. National regulations continue to apply in lieu of EU regulations. However, if a member state wishes to apply the derogation, it has to notify the EC, and the derogation can only take place on the basis of scientific evidence that supports it. It goes without saying that this refers to evidence concerning environmental protection that results from specific problems of that country and that has arisen as a result of the country's incorporation of EU-wide legal solutions into the national legal order (Article 114(3) TFEU).

Statistics have shown that derogations are becoming increasingly common in environmental policy.[579] However, whatever one may glean from these data, the clear increase in the number of notifications from member states in recent years demonstrates the usefulness of this derogation mechanism. At the same time, in the context of EU environmental policy, derogations should also be viewed as signals that point to the difficulties of implementing EU standards and legislation into national practice. This is hardly surprising given that the EC's derogation decisions usually pertain to harmful chemicals, additives in food production, diesel cars, and trade in genetically modified organisms, among others. The complex nature of all of these issues and the detailed regulations that they it has engendered delay the process of implementing successive stages of EU environmental policy.[580] It is worth noting that the derogation allows all parties to reduce the costs of introducing EU regulations and constitutes a solution that allows for individual, autonomous approach to specific issues. Nevertheless, one should bear in mind that this mechanism is not a shortcut to avoiding the large-scale harmonization of legislation.

579 According to 2020 data, the EC has accepted 27 national derogations for environmental protection, food products, and natural resources alone: https://ec.europa.eu/search/?queryText=Derogation&query_source=europa_default&page=&filter=GENERAL_FILTER%3A%3AENVIRONMENT+FOOD+AND+NATURAL+RESOURCES__GENERAL_FILTER%3A%3AENVIRONMENT+FOOD+AND+NATURAL+RESOURCES%3A%3ACLIMATE+CHANGE__GENERAL_FILTER%3A%3AENVIRONMENT+FOOD+AND+NATURAL+RESOURCES%3A%3AFOOD+PRODUCTION&swlang=de&filterSource=europa_default&more_options_date=*&more_options_language=de&more_options_f_formats=*.

580 Andrzej Wróbel (ed.), *Traktat o funkcjonowaniu Unii Europejskiej: Komentarz*, Wolters Kluwer, Warszawa 2012, vol. II, p. 566–572.

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2. The environmental protection dilemma: National or EU-level protection?

Any assessment of environmental policy from the point of view of national adaptation strategies must be preceded by a reflection on the objectives of the actions that are taken or proposed. In each case, the impact of the EU's stated goal on national policy must be taken into account. The four objectives set out in Article 191(1) TFEU form the bedrock of these actions:

1) preserving, protecting, and improving the quality of the environment;
2) protecting human health;
3) prudent and rational use of natural resources;
4) promoting measures at the international level to deal with regional or worldwide environmental problems, in particular the fight against climate change.

While Article 191(1) TFEU, as part of the EU's environmental policy, sets out both objectives and expected results, it also describes the path and means by which those results are to be achieved.[581] This approach differs markedly from those most commonly applied in EU law. The frameworks of other policies of the European Union typically also include objectives, but they does not usually translate into recommendations on how to shape a specific EU policy under a specific set of guidelines. Conversely, simply formulating the four objectives of environmental policy at the treaty level is not enough, as the EU has not only foreseen the results of the policy actions, but also defined ways to achieve them. Given the above, the EU's specific environmental legislation has brought under the horizontal principles of EU environmental law, which include:

1) the principle of a high level of environmental protection,
2) the principle of prevention,
3) the principle of rectifying damage at source,
4) the principle of offender liability ("polluter pays"), and
5) the principle of sustainable development.

Applying these principles requires member states to make the appropriate legal changes, which stems from cooperation at both the EU and national level, as previously mentioned.[582] However, the discussion does not end there, as the

581 On the difference between objectives or tasks on the one hand, and the principles governing their implementation on the other, see Martin Burgi, *Das Schutz- und Ursprungsprinzip im europäischen Umweltrecht,* "NuR" 1 (1995), p. 11–15, in particular see p. 13.

582 For more on the importance of environmental protection principles in the context of shaping EU environmental policy, see: Jan W. Tkaczyński, *op.cit.*, p. 47–52.

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guiding principles and objectives behind EU environmental policy still benefit from selective clarification. The objectives, while limited to only four areas of action, are divergent in certain ways. Although the resulting gaps are not critical or extremely consequential, they undoubtedly affect the shape of a policy that aims to preserve and protect the environment on the one hand and human health on the other. In most cases, there seems to be no discrepancy among the objectives. Still, we know that radical protection of the natural environment may be incompatible with protection of human health in specific cases. One example is the unchecked population growth of certain wild animals and the associated heightened risk of transmission of the rabies virus, which clearly threatens human health.

The integration clause provides another principle underlying EU environmental action, though it should be pointed out that the objectives of this policy sometimes remain far removed from social or economic considerations. This undoubtedly weakens the integration clause already in the objective-analysis phase by reducing environmental policy to purely sectoral activities. With the exception of the objectives that relate to the protection of human health, there are no direct references to economic measures in this policy. If we assume that the purpose the EU's activity on this front is to promote the well-being of its inhabitants (in accordance with Article 3(1) TEU), such a reference would be most welcome. That is one side of the coin. On the other hand, nothing in the structure of the objectives of EU environmental policy contradicts the overarching goal of achieving economic growth as such, or even with increasing the competitiveness of the economy. After all, supporting the growth of citizens' welfare partially stems from economic growth, which is based on intensified human use of the environment, and this is an objective embedded within other EU policies. In this respect, EU policy rather aims at achieving economic growth by minimizing negative impacts on the environment (e.g., by expanding the use of renewable natural resources). This is also illustrated by the third policy objective, namely the prudent and rational use of natural resources.

The risk of irrational environmental management is not so much due to misguided policy as to a lack of respect for the limited availability of environmental resources. However, if the production cycle, which underpins economic growth, is to be regulated, access to natural resources (also in the technical sense) remains an important component of economic stability. It is undeniable that increasing consumption contributes to increased demand for goods and services produced, which the economy tries to meet. On the one hand, this leads to the development of industry and agriculture, which is associated with significant increases in demand for electricity, while on the other hand, it translates into increased extraction of natural resources. This is illustrated by statistics on the consumption of raw materials in the world, as cited elsewhere in this book. The

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measures taken by the EU in recent years therefore clearly show that, in the near term, the prudent and rational use of natural resources will be at the heart of environmental policy in the Union.

The remarks above do not invalidate the basic dilemma of environmental protection measures, namely the potential opposition between economics and environmental protection. This dilemma needs to be solved in the context of both EU and national environmental measures. One way to illustrate this tension is to ask whether the environment is part of the economy or, on the contrary, the economy is part of the environment. Economists look at the natural environment as a part of the economy, while environmentalists treat the latter as a component of the environment. In relation to the latter position, only a small group of economic indicators contains no visible signs of (or potential for) interference with the natural environment.[583]

Recognizing the causal link between economic growth and the increased exploitation of natural resources, EU environmental policy does not remain silent in the face of this dilemma. Breaking this link is one of the main elements of the EU's sustainable environmental policy in its new form.[584] This is supported by an interpretation of Article 11 TFEU, which points to the concept of sustainable development as the basis for "the definition and implementation of the Union policies and activities." These can be reduced to a kind of social and economic development that incorporates activities aimed at increasing and sustaining economic growth while maintaining the natural balance and the sustainability of basic natural processes. All of this is aimed at guaranteeing that the needs of both the present and future generations are satisfied.

The importance of sustainable development in the EU's approach also stems from the fact that the latter is a concept combining not only the sectoral dimension of environmental protection but also other elements that are relevant to development.[585] The concept in question is based on assigning equal importance to three dimensions: (1) environmental protection, (2) the economy, and (3) society.[586]

From the standpoint of environmental protection, the principle of sustainable development means that the degradation of the natural environment must be decoupled from the level of economic growth at any given time, and natural

583 Lester R. Brown, *Gospodarka ekologiczna na miarę ziemi*, Książka i Wiedza, Warszawa 2003, p. 19.

584 Communication from the Commission, A Sustainable Europe for a Better World: A European Union Strategy for Sustainable Development [in:] COM(2001) 264 final, May 15, 2001.

585 Błażej Wierzbowski / Bartosz Rakoczy, *Prawo ochrony środowiska: Zagadnienia podstawowe*, Wolters Kluwer, Warszawa 2012, p. 44–45.

586 Jan W. Tkaczyński / Marek Świstak, *Encyklopedia polityki regionalnej i funduszy europejskich*, C.H.Beck, Warszawa 2013, p. 593.

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Table 25. Dimensions of sustainable development

Ecological dimension	Economic dimension	Social dimension
– human health – ecosystem structure – protection of ecosystem services	– economic stability – maintaining and further developing market economy structures – identity development	– ensuring health and well-being – safeguarding social stability – securing the development and viability of society

Source: Jan W. Tkaczyński / Marek Świstak, *Encyklopedia polityki regionalnej i funduszy europejskich*, C.H. Beck, Warszawa 2013, p. 593.

resources must be protected and managed in a way that allows for their regeneration. This model of sustainable development requires activities that go far beyond the thematic area and narrow understanding of environmental protection. Thus, a revised framework of sustainable development outlined in this way would require measures to be taken in the following areas:[587]

1) climate change and clean energy,
2) sustainable transportation,
3) sustainable consumption and production,
4) conservation and management of natural resources,
5) public health,
6) social inclusion, demographic issues, and migration,
7) the challenges of global poverty and sustainable development.

For each member state, the implementation of environmental policy is primarily about adapting its own standards to EU requirements. As a result, it is impossible to ignore timeframes when assessing the true scale of environmental protection. There is no doubt that, in the short term, the need for increased environmental protection may contribute to the reduction of the economic growth and associated dynamics. At the same time, one can reasonably expect that the long-term effects of these measures will contribute to further economic development. There is no need to illustrate this dependency with macroeconomic data. The example of China, which is the partial focus of this book, encapsulates them elegantly. However, when analyzing the objectives of the EU environmental policy as laid out in the substance of the European treaties, one should note that their operationalization in the form of quantifiable indicators is very difficult. It is fruitless

587 Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Mainstreaming sustainable development into EU policies:2009 Review of the European Union Strategy for Sustainable Development [in:] COM(2009) 400 final, July 24, 2009, [in:] https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2009:0400:FIN:EN:PDF.

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look for one-to-one equivalents between individual high-level objectives and the indicators in the toolbox of the EU's executive institutions. This greatly complicates any assessment of policy effectiveness in both its national and EU-wide dimensions, regardless of whether the lack of complete correspondence is the result of deliberate legislative action or a byproduct of executive action.

However, the lack of clearly defined indicators does not mean that we remain helpless when trying to quantify the effectiveness of environmental protection measures. One way to accomplish this is through cyclical Environmental Action Programmes,[588] which form the basis for EU environmental policy. These Programmes contain strategic objectives and deadlines for their achievement, and describe basic directions of activity in the field of environmental protection in the medium term. They set out the trajectory of EU activities in a given area of environmental protection and create a foundation for EU regulations, despite having no binding force of their own. The resulting regulations, in turn, constitute the basis for developing similar documents at the national, regional, and local levels.

A measurable(and therefore quantifiable) indicator is the degree of implementation of EU environmental law into the national order, as well as the integration of newly established law that results from the Environmental Action Programmes.[589] This translates into specific adaptational measures, which nevertheless come at a significant cost. Examples include the requirement to reduce greenhouse gas emissions or to establish strong and airtight systems for controlling the circulation of chemicals.[590] Thus, the participation of a given member state in EU environmental policy cannot be reduced to purely legislative implementation; we must also keep in mind the need to undertake specific actions that are 'monetized' through dedicated financial resources, often in non-negligible amounts.

The increasing importance of EU environmental policy cannot and should not be overshadowed by imperfect cooperation between all environmental policy

588 Based on the findings of the heads of state and government of the member states in 1972, these include the following Action Programmes with their corresponding periods: 1973–1976 (1st Programme), 1977–1982 (2nd Programme), 1983–1986 (3rd Programme), 1987–1992 (4th Programme), 1993–2001 (5th Programme), 2002–2012 (6th Programme), and 2013–2020 (7th Programme).

589 Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on implementing European Community Environmental Law [in:] COM(2008) 773 final, November 18, 2008.

590 Zbigniew Bukowski, *Prawo ochrony środowiska Unii Europejskiej*, Wolters Kluwer, Warszawa 2007, p. 23–27.

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actors involved, especially the member states and EU institutions.[591] This is exemplified by the current 7th Environmental Action Programme, titled "Living well, within the limits of the planet."[592] A closer look at the Programme clearly reveals that the siloed, sectoral approach to environmental policy, which still pervaded the Sixth Action Programme,[593] is being abandoned. It correctly assumes that the problems shaping the natural environment and influencing its state are interdependent and the challenges facing its protection go far beyond national borders. Hence, the 7thProgramme includes nine priority objectives and actions that the EU must take in order to achieve these objectives by 2020. These are expressed in Article 2 of the Programme:

(a) to protect, conserve and enhance the Union's natural capital;
(b) to turn the Union into a resource-efficient, green, and competitive low-carbon economy;
(c) to safeguard the Union's citizens from environment-related pressures and risks to health and well-being;
(d) to maximize the benefits of Union environment legislation by improving implementation;
(e) to improve the knowledge and evidence base for Union environment policy;
(f) to secure investment for environment and climate policy and address environmental externalities;
(g) to improve environmental integration and policy coherence;
(h) to enhance the sustainability of the Union's cities;
(i) to increase the Union's effectiveness in addressing international environmental and climate-related challenges.

Each of these objectives demonstrates that the rules outlined above binding in nature. In addition, it is notable that the application of these rules follows the same patterns as either the direct application of EU law or national legislation that implements it indirectly. The specificity of this implementation lies in the fact that the implementation of EU environmental law rests primarily in the hands of member states. This is clearly documented in Article 192(4) TFEU, which states that "[w]ithout prejudice to certain measures adopted by the Union, the Member States shall finance and implement environmental policy." However, the member states' authority in this area does not mean that their legal

591 Note 5 to Decision 1386/2013 of the European Parliament and of the Council of 20 November 2013 on a General Environmental Action Programme to 2020 "Living well, within the limits of our planet" [in:] OJEU L 354, 28. 12. 2013, p. 171.

592 *Ibidem.*

593 Decision 1600/2002 of the European Parliament and of the Council of 22 July 2002 laying down the Sixth Community Environment Action Programme [in:] OJEU L 242, 10. 9. 2002, p. 1.

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obligation to implement EU law is weakened. Thus, the practical difficulties that the member states sometimes encounter and highlight during the implementation process do not change or derogate their responsibilities in any way,[594] and do not release them from implementing the environmental policies adopted by the European Union.

3. Strategic cooperation between the EU and China for a low-carbon economy as an expression of a new perspective on environmental protection

It is beyond dispute that both China and the European Union stand to gain from promoting low-carbon development through the dissemination of clean and renewable energy sources, as this inevitably leads to increased environmental protection.[595] The depletion of fossil fuel resources and the accompanying changes in the global energy mix make Europe and China not only competitors in the global economic race, but also *nolens volens* partners. Their pragmatic partnership is characterized, on the one hand, by the need to take action to reduce the consumption of fossil fuels and, on the other, by the desire to minimize the negative environmental impact of their use. Hence, the existing and emerging cooperation between the two actors, while challenging for a number of reasons, is not only an attempt to set up channels to exchange vital information, but also an exercise in setting the standards under which further cooperation will be forged.

Thus, it is not surprising that both parties give the development of the renewable energy sector priority status, as renewables provide an alternative to fossil fuels and at the same time contribute to the reduction of greenhouse gas emissions. However, as we already know, the Chinese economy is extremely energy-intensive. Energy consumption per unit of GDP is still very high, despite plans to curb it. It is no secret that China, faced with uncertainties on the international energy markets, is facing the major challenge of heavy dependence on oil and gas imports.

Of course, another overarching challenge is that global climate change has increased pressure to reduce carbon dioxide emissions in China. However, the energy transition schemes devised in response to this challenge remain a long-term endeavor and require finding the right balance between the development of

594 Astrid Epiney, *Umweltrecht der Europäischen Union*, Nomos, Baden-Baden 2019, p. 249.
595 Zsuzsa Anna Ferenczy, *Green Power? European Normative Influence on Chinese Environmental Policy*, "Australian and New Zealand Journal of European Studies" 11(1) (2019), p. 27.

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conventional coal-based energy and the dissemination of clean solutions. Therefore, for the authorities in Beijing, the solutions embraced by the European Union may prove extremely valuable, not only in terms of effective energy management, but also in reducing energy consumption and pollutant emissions.

Beyond these introductory remarks, we cannot forget that energy transformation remains one of the key building blocks of a low-carbon economy. This is the starting point for the European Union, which – with its experience in technological innovation and low-carbon energy management – views the development of a low-carbon economy precisely as a long-term strategy.[596] This is reinforced by the fact that energy security and the transition to a low-carbon economy have been prioritized in the implementation of EU financial instruments for 2014–2020.[597] It is clear that competition on the low-carbon market is a driving force in promoting sustainable energy development worldwide.[598] While China also sees low-carbon development as a tool of economic transition, it is a major challenge for both sides to harmonize their respective visions so as to achieve mutual benefits – and, even more importantly, to create a strategic partnership for global governance of climate change.

The energy dialogue between the European Union and China has a long history. It began in 1981 with a visit to the Middle Kingdom by representatives of the Directorate-General for Energy (DG ENER). This body is responsible for the development and implementation of the EU's energy strategy and policy and conducts dialogue in this area with third countries. It is important to note that many energy policy issues overlap with environmental and climate issues, although the latter are formally under the auspices of the Directorate-General for Climate Action (DG CLIMA) and the Directorate-General for the Environment (DG ENV). Thus, from the very beginning, energy has been one of the key issues raised in the bilateral China-EU dialogue, alongside economic and trade issues.

The history of this dialogue includes the joint launch of the first energy management and energy efficiency training programs in five Chinese cities (Hangzhou, Nanjing, Shanghai, Tianjin, and Chongqing), which took place in 1982 and was facilitated by both China and the EU. These consisted mainly of workshops and study visits to Europe for Chinese engineers and industry

596 Going Climate Neutral by 2050. A Strategic Long-Term Vision for a Prosperous, Modern, Competitive and Climate Neutral EU Economy, European Union, 2019, https://ec.europa.eu/clima/sites/clima/files/long_term_strategy_brochure_en.pdf.

597 EU energy Security Strategy, European Union, Communication from the Commission to the European Parliament and the Council [in:] COM(2014) 330 final, Brussels, May 28, 2014, p. 20, https://ec.europa.eu/energy/sites/ener/files/publication/European_Energy_Security_Strategy_en.pdf.

598 Wang Wentao / Liu Yanhua, *Geopolitics of global climate change and energy security,* "Chinese Journal of Population Resources and Environment" 13(2) (2015), p. 124.

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managers, representatives of government, and local administration.[599] The 1985 Agreement on Trade and Economic Cooperation between the European Economic Community and the People's Republic of China referred to the development of economic cooperation in the following areas: industry and mining, agriculture, science and technology, energy, transport and telecommunications, environmental protection, and cooperation in third countries.[600] This was the first time that official European messaging included a declaration of readiness to cooperate with China in the field of energy and environmental protection.

This cooperation was revived in the early 1990s, when the annual EU-China Energy Dialogue summits were launched. The first of these took place in 1994 in Brussels and was organized by the Ministry of Science and Technology of the PRC in cooperation with DG ENER. The Dialogue focuses on six thematic areas:

(a) renewable energy,
(b) smart grid development,
(c) energy efficiency in the construction sector,
(d) the dissemination of clean coal technology,
(e) nuclear energy, and
(f) energy sector regulation.

The actions taken by Brussels at the time reflected a desire to share its own experiences. This in turn corresponded with China's interest in applying EU best practice in areas concerning the energy sector and the environment, particularly the dissemination of clean coal technology, the development of the natural gas sector, improving energy efficiency, and the development of renewable energy. These directions of action were reflected in the very first document on the long-term development of mutual relations, announced by the European Commission in July 1995. This conveyed a convergence of interests in solving global problems, such as environmental protection. The need to use the EU's expertise in shaping environmental policy and popularizing low-carbon energy technologies was highlighted. Knowledge and technology transfer were to take the form of support for specific projects in China, including work related to gas extraction technologies. At the same time, Brussels underscored the problem of increasing energy consumption in China, which remains a major environmental challenge.[601]

599 Zhang Chao, *The EU-China Energy Cooperation: An Institutional Analysis*, Briefing Paper, February 2017, p. 7.

600 Agreement on Trade and Economic Cooperation between the European Economic Community and the People's Republic of China [in:] OJEU L 250, 19.09.1985, p. 2.

601 A long term policy for China-Europe relations, Communication from the Commission [in:] COM(1995) 279 final, Brussels, August 5, 1995.

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This issue was also highlighted by the EU three years later, in 1998, when the Union drew up the guidelines on which its policy towards China is still based today. The EU stressed that the development of the Chinese economy, combined with the growing demand for energy and the high rate of industrialization, has severe environmental impacts, not only at the regional or national level, but also globally. Consequently, it signaled that it was ready to transfer know-how related to environmental protection and the energy sector. Priority areas included improving energy efficiency as well as developing clean coal technologies and alternative energy sources, particularly natural gas.[602] This was also the case in the following years, as exemplified by the EU's September 2003 declaration of continued interest in broadening the policy dialogue on environment and energy and complementing it with planned projects in this field in the future.[603]

An analogous change in behavior took place on the Chinese side. In October 2003, China published a document defining its relations with the European Union(China's Policy Paper on the European Union) – a first-time move for the country.[604] In the section on energy cooperation, it highlighted areas of interest such as the energy structure, clean and renewable energy sources, and energy efficiency. Seeing the need to exchange experiences in the field of effective energy policy, the authors attached particular importance to technology transfers based on training and joint participation in experimental projects.[605]

The next EU-China strategy paper, published in October 2006, highlighted China's rapidly growing demand for raw materials and energy and the negative environmental impact of industrial and economic development. The EU underlined the importance of international cooperation with China in the context of making sustainable development a reality. Its stated position was that the confluence of the two parties' interests should aim at ensuring the security of the sustainable energy supply and China's integration into global energy markets as

602 Building a Comprehensive Partnership with China, Communication from the Commission [in:] COM(1998) 181 final, Brussels, March 25, 1998, https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:51998DC0181&from=EN.

603 A maturing partnership – shared interests and challenges in EU-China relations (Updating the European Commission's Communications on EU-China relations of 1998 and 2001), Commission Policy Paper for transmission to the Council and the European Parliament [in:] COM(2003) 533 final, Brussels, September 10, 2003, http://trade.ec.europa.eu/doclib/docs/2005/september/tradoc_124565.pdf.

604 Zhongguo dui Oumeng zhengce wenjian (中国对欧盟政策文件, China's Policy Paper on the European Union), Zhongyang zhengfu menhu wangzhan (中央政府门户网站), October 2003, http://www.gov.cn/gongbao/content/2003/content_62478.htm.

605 *Ibidem.*

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well as into the governing bodies of multilateral mechanisms.[606] The document also referred to the mutual commitments made in 2005.

Two important action plans were signed in March 2005: the Action Plan on Clean Coal and Action Plan on Industrial Cooperation on Energy Efficiency and Renewable Energies. Both became part of the EU-China Climate Change Partnership, which was established in September of the same year and provides a framework for high-level cooperation and political dialogue. One of the main objectives of the partnership was to develop and demonstrate the potency of 'zero-carbon' coal technology based on carbon capture and storage as well as to promote clean/renewable energy sources and energy efficiency. Two specific targets were set for 2020:developing and demonstrating advanced near-zero carbon technology in China and the EU, and reducing the cost of key energy technologies, gradual deploying them, and facilitating their diffusion.[607] This Partnership was maintained in the 2010 and 2015 Joint Statements, as well as in statements by the leaders of the respective parties on both sides in 2018.[608]

A practical expression of the growing commitment to dialogue was the presentation of relevant aid programs by Brussels. For example, the European Investment Bank (EIB) lent EUR 500 million to China for projects to mitigate climate change in late 2010.[609] Additionally, a five-year Europe-China Clean Energy Centre (EC2) cooperation program was launched in April 2010, financed by the European Union. The project's objectives include promoting the use of clean energy in China and supporting the Beijing government's efforts to build a more sustainable and environmentally friendly energy sector. The program also included points that related to technology transfer in the development of clean coal technologies and carbon sequestration, sustainable development in biofuel production, developing renewable energy sources and improving energy effi-

606 EU – China: Closer partners, growing responsibilities, Communication from the Commission to the Council and the European Parliament [in:] COM(2006) 631 final, October 24, 2006, https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52006DC0631&-from=EN.

607 EU-China Partnership on Climate Change, September 2, 2005, http://europa.eu/rapid/press-release_MEMO-05-298_en.htm.

608 Joint Statement on Dialogue and Cooperation on Climate Change, April 29 2010, https://ec.europa.eu/clima/sites/clima/files/international/cooperation/china/docs/joint_statement_dialogue_en.pdf; EU-China Joint Statement on Climate Change, June 29, 2015, https://www.consilium.europa.eu/media/23733/150629-eu-china-climate-statement-doc.pdf; EU-China Leaders' Statement on Climate Change and Clean Energy, July 16, 2018, https://ec.europa.eu/clima/sites/clima/files/news/20180713_statement_en.pdf.

609 *China: EUR 500 million loan for Climate Change mitigation projects*, December 3, 2010, https://ec.europa.eu/commission/presscorner/detail/en/BEI_10_218.

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ciency (particularly in industry and construction), and the construction of sustainable and efficient distribution systems.[610]

There are also numerous examples of academic cooperation between the two sides. In 2010, the China-EU Institute for Clean And Renewable Energy (ICARE, 华中科技大学中欧清洁与可再生能源学院) was established in Huazhong University of Science and Technology in Wuhan. The project has received funding from both the EU and China, and offers adouble master's degree program in clean energy development. ICARE is a consortium of 7 academic institutions in 5 European countries and 3 institutions in China. This includes representatives of the following centers: France (ParisTech, University of Perpignan Via Domitia, French International Office for Water), Greece (National Technical University of Athens), Spain (Zaragoza University), United Kingdom (Northumbria University), Italy (La Sapienza University), and China (Huazhong University of Science and Technology in Wuhan, Wuhan University of Technology in Wuhan, Southeast University in Nanjing).[611] ICARE's goal is not only to train high-level professionals, but also to establish a platform for cooperation with European clean energy experts.

In parallel with these institutional partnerships, the annual EU-China Summits, initiated in 1998, primarily tackle energy issues. Their importance, which is by no means a façade, can be evaluated on the example of the solutions adopted at the 8th EU-China Summit in Beijing in 2005, whereas Memorandum of Understanding on the China-EU Dialogue on Energy and Transport Strategies was signed, forming the basis for the exchange of experience on the energy and transportation fronts.[612] The first meeting that adopted the formula embedded in the MoU took place the following year (2006). Most of the dialogue on these topics revolves around several strategic areas related to the energy market, the renewable energy (including alternative fuels) in transport, energy efficiency, promoting clean coal technologies, and reducing carbon dioxide emissions.

The following, 9th EU-China Summit, held in Helsinki in 2006, resulted in a joint statement in which the parties committed to deepening their dialogue on climate change. In retrospect, the statement's mention of an "integrated approach" to energy and climate change gains particular importance, as it recognizes the need to achieve synergies between energy security, sustainable energy supply, innovation, and reducing greenhouse gas emissions. At the same time, the parties gathered in Helsinki stressed that global energy security is essential to ensuring economic growth and an adequate standard living, maintaining peace

610 EU-China Clean Energy Centre (EC2), http://eeas.europa.eu/archives/delegations/china/documents/eu_china/science_tech_environment/ec2.pdf.

611 See http://icare.hust.edu.cn/.

612 Joint Statement of the 8th EU-China Summit, September 5, 2005, https://ec.europa.eu/commission/presscorner/detail/en/IP_05_1091.

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and stability, and promoting global development.[613] This approach reemerged in 2007 at the 10th Summit, held in Beijing. The assembled parties recognized energy production as a global issue that is closely linked to the economic and social development of all nations.[614]

The 4th EU-China Energy Dialogue (Shanghai, 2010) was unique in that it was held at the ministerial level for the first time, thus underscoring the growing importance of energy issues in policymaking on both sides. The following year, both sides agreed to set up two working groups on transport and energy to discuss the implementation of specific projects in these areas. The first EU-China High-level Energy Meeting was held in May 2012. It was certainly not a coincidence that three important documents were also adopted at the same time:

(1) Joint Declaration on the EU-China Partnership on Urbanisation,[615]
(2) EU-China Joint Declaration on Energy Security,[616] and
(3) Joint Statement for Enhanced Cooperation on Electricity Markets Between the European Commission and the State Electricity Regulatory Commission of China.[617]

The first of these documents announced the creation of the EU-China Urbanisation Partnership, coordinated jointly by the Directorate-General for Energy (DG ENER) and China's National Development and Reform Commission (NDRC). From the beginning, this partnership was focused mostly on the development of innovative, smart, and green cities, as well as sustainable urban mobility. Experimental projects were launched in order for European experts to assess the suitability of specific technologies for the Chinese case.

The strong bilateral interest in co-creating a specific concept (project) is particularly well illustrated by the development of smart cities projects.[618] China

613 Joint Statement of the Ninth EU-China Summit, Helsinki September 9, 2006, https://www.consilium.europa.eu/ueDocs/cms_Data/docs/pressData/en/er/90951.pdf.

614 10th China-EU Summit. Joint Statement, Council of the European Union, Beijing, 16070/07 (Presse 279), November 28, 2007, https://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/er/97355.pdf.

615 Joint Declaration on the EU-China Partnership on Urbanisation, May 3, 2012, https://ec.europa.eu/energy/sites/ener/files/documents/20120503_eu_china_joint_declaration_urbanisation_en.pdf.

616 EU-China Joint Declaration on Energy Security, May 3, 2012, https://ec.europa.eu/energy/sites/ener/files/documents/20120503_eu_china_joint_declaration_energy_security_en.pdf.

617 Joint Statement for Enhanced Cooperation on Electricity Markets between the European Commission and the State Electricity Regulatory Commission of China, May 3, 2012, https://ec.europa.eu/energy/sites/ener/files/documents/20120503_eu_china_joint_statement_electricity_markets_en.pdf.

618 China Academy of Information and Communications Technology, EU-China Policy Dialogues Support Facility II, Comparative Study of Smart Cities in Europe and China 2014,

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has developed an integrated approach to urbanization and sustainable development, demonstrating political commitment to innovative solutions in this area. The EU, on the other hand, remains a particularly good example of energy conservation in construction and industry, building on years of experience in this field. It is worth noting that buildings account for around 40 % of energy consumption in the EU and generate 36 % of all CO_2 emissions, while more than one third of them are conservatively estimated to be at least fifty years old. Hence, experts believe that improving the energy efficiency of buildings will reduce energy consumption in the EU by 5–6 % and cut CO_2 emissions by 5 %.[619] Thus, it comes as no surprise that the European Union has obliged the member states to present long-term strategies to support building restoration. This is best expressed by the Clean Energy for All Europeans package, which underlines the need for highly energy-efficient and low-carbon building stock in each member state.[620]

These joint solutions have enabled the creation of a channel between cities in the EU and China that facilitate the exchange of knowledge, experience, and good practice on urban development and low-carbon planning. For instance, the joint training project CETREGIO (Chinese European Training on Regional Policy) was carried out between 2010 and 2014 and involved 220 Chinese policymakers from all 31 provincial-level jurisdictions. The project consisted of study visits to 17 EU member states during which regional development experts from the EU and China shared their experiences. Between 2015 and 2016, China was one of four non-EU countries participating in the EU's international program on regional and urban policy.

Additional examples include numerous 'smart cities' projects (e. g., Sharing Cities) and a three-year program launched by the EU to promote international cooperation on sustainable urban development (International Urban Cooperation programme, IUC; 2017–20). The latter links European cities with partner cities in China, India, Japan, and North and South America, providing access to expertise in urban planning and development, including on such topics as the promotion of green and smart energy management solutions.[621] On the margins

Springer 2016; EU-China Smart and Green City Cooperation: Comparative Study of Smart Cities in Europe and China, March 2014.

619 Energy performance of buildings directive, European Commission, https://ec.europa.eu/energy/sites/ener/files/documents/buildings_performance_factsheet.pdf.

620 Clean Energy for All Europeans, Communication form the Commission to the European Parliament, the Council, the European Economic and Social Committee, the Committee of the Regions and the European Investment Bank, European Commission, Brussels, COM (2016) 860 final, November 30, 2016, https://ec.europa.eu/energy/sites/ener/files/documents/com_860_final.pdf.

621 *City-to-city pairings*, International Urban Cooperation, European Union, https://iuc.eu/city-pairings/?c=search&country=China.

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of the EU-China High Level Regional Policy Dialogue in 2018, five joint declarations were signed between Chinese and European cities under the EU's international urban cooperation program: Kunming and Granada, Haikou and Nice, Yantai and Rome, Liuzhou and Barnsley, and Weinan and Reggio Emilia.[622]

This range of initiatives is complemented by the EU-China Sustainable Urbanisation Flagship Initiative, which focuses on creating new urban solutions alongside Chinese partners. This initiative is also a form of support for EU companies that enables them to gain access to new markets.[623] One product of the initiative is the Trans-Urban-EU-China project, which involves experts from 8 European and 6 Chinese organizations and aims to promote the dissemination of best practices in Chinese urban agglomerations.[624] The importance that China attaches to this kind of cooperation is embodied by Prime Minister Li Keqiang's May 2012 declaration that China is ready to strengthen cooperation with the EU on the development of new and renewable energy sources, energy conservation and environmental protection, the circular economy and eco-friendly waste disposal, and the construction of green and low-carbon cities.[625]

Another notable document is the EU-China Joint Declaration on Energy Security, which sets out a formal framework for cooperation between the parties as major energy consumers and strategic partners. The China-EU Energy Security Working Group, established in July 2012, developed a roadmap for achieving a low-carbon economy (June 2016). As part of this initiatives, the parties have committed to taking joint action on energy and climate, including on the security of the energy supply, energy infrastructure, and market transparency. The Working Group also highlighted critical areas for joint action such promoting energy efficiency, developing RES through increased competition and cost reduction, disseminating interconnected heating and energy systems, developing the biogas sector, and establishing smart grids.[626]

However, the EU-China 2020 Strategic Cooperation Programme, adopted in 2013, is of even greater significance. This document, which lays down the guiding

622 *Commissioner Creţu in Beijing and Zhengzhou for the EU-China dialogue on regional and urban policy*, European Commission, July 13, 2018, https://ec.europa.eu/regional_policy/en/newsroom/news/2018/07/13-07-2018-commissioner-cretu-in-beijing-and-zhengzhou-for-the-eu-china-dialogue-on-regional-and-urban-policy.

623 EU-China Sustainable Urbanisation Flagship Initiative, https://eeas.europa.eu/sites/eeas/files/eu_china_research_in_urbanisation.pdf.

624 Trans-Urban-EU-China, http://transurbaneuchina.eu/project/.

625 Break New Ground in Pursuing China-EU Strategic Cooperation on Urbanization, Address by H.E. Li Keqiang Vice Premier of the State Council of the People's Republic of China at the Opening Ceremony of the High-Level Conference on China-EU Urbanization Partnership, May 3, 2012, https://www.fmprc.gov.cn/mfa_eng/wjdt_665385/zyjh_665391/t930197.shtml.

626 EU-China Roadmap on energy cooperation (2016–2020), June 29, 2016, https://ec.europa.eu/energy/sites/ener/files/documents/FINAL_EU_CHINA_ENERGY_ROADMAP_EN.pdf.

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principles for bilateral relations between the EU and China, identified sustainable development as a key area of cooperation and called for joint action in areas such as science, technology and innovation, energy, sustainable urbanization, climate change, and environmental protection.[627] The fifth generation of Chinese leaders, spearheaded by Xi Jinping, reiterated the vital importance of these principles soon after ascending to power, via China's Policy Paper on the European Union, published in 2014.[628] In this document, we find a declaration of readiness to develop pragmatic cooperation for low-carbon development, fight against climate change and environmental pollution, as well as to expand cooperation on energy security and jointly solve problems related to price competition, security of supply, and environmental requirements. It also emphasized the importance of water management and protection – an especially significant acknowledgment given China's weak and patchy water management record.[629]

The European Union has evoked similar sentiments, illustrated by a June 2016 Joint Communication titled *Elements for a New EU Strategy on China*,[630] which reflects a willingness to embrace a new approach with regard to China. This document stresses the need to strengthen dialogue with China and to leverage its commitment in the fight to counter climate change. In order to avoid hollow declarations, the EU also committed to establishing a common agenda in areas such as:

(a) tackling air, water and soil pollution,
(b) the circular economy,
(c) sustainable management of ocean resources, and
(d) fighting threats to habitats and biodiversity.

However, such pragmatism in formulating its objectives does not exempt the EU from clearly indicating that part of its task is to actively support and encourage economic, environmental, and social reforms in China.[631] Hence the need to work together to build a modern, pluralist, and globally effective energy architecture, and to support China's contacts with the International Energy Agency to promote cooperation on energy security, energy data and statistics, and energy

627 EU-China 2020 Strategic Agenda for Cooperation, http://eeas.europa.eu/archives/docs/china/docs/eu-china_2020_strategic_agenda_en.pdf.

628 Zhongguo dui Oumeng zhengce wenjian (中国对欧盟政策文件, China's Policy Paper on the European Union), Zhongyang zhengfu menhu wangzhan (中央政府门户网站), February 14, 2014, http://www.china.org.cn/chinese/2014-04/02/content_31981279_9.htm.

629 *Ibidem.*

630 Joint Communication to the European Parliament and The Council, Elements for a New EU Strategy on China, High Representative of the Union Foreign Affairs And Security Policy, Brussels, June 22, 2016 JOIN(2016) 30 final, https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52016JC0030&from=PL.

631 *Ibidem.*

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policy analysis. In the context of the dialogue with China, the EU has emphasized transparency, standards, and regulation in the energy sector. According to the Joint Communication, the EU should aim at supporting national energy reforms, mainly in the areas of energy efficiency, sustainable energy, and resource efficiency, in addition to seeking opportunities for joint research and development in the area of clean energy technologies.[632]

The next step was to compel a mutual commitment of support between the EU and China in the context of achieving global climate change goals. At the 20th EU-China Summit, held in July 2018 in Beijing, leaders from both sides signed a declaration on climate change and clean energy. This declaration commits both parties to strengthening cooperation on low-carbon development and implementing the 2015 Paris Climate Agreement, as well as to intensifying political, technical, economic, and scientific cooperation on the climate and clean energy.[633]

China has upheld its commitments in its third Policy Paper on the European, Union published in December 2018.[634] In this document, China stressed the need to develop energy cooperation, mainly in the areas of energy efficiency and promotion of clean and renewable energy sources. It also signaled its willingness to develop an environmental dialogue and establish a partnership for green development, pollution prevention and control, environmental governance, protection of biodiversity, and green growth, and to implement joint research in all these areas. It also mentioned the possibility of joint action on combating climate change, strengthening cooperation with regard to the emissions trading scheme, and the development of low-carbon cities.[635]

The 21st EU-China Summit in Brussels in April 2019 featured a Joint Statement on the Implementation of EU-China Energy Cooperation, in which the parties underscored that the overarching objective of such cooperation would be to support the global transition to clean energy. This avenue of cooperation will be based on equitable exchange and equal business opportunities and will focus on developing renewable energy sources, improving energy efficiency, developing energy markets and systems, and increasing business engagement in the energy sector. The document also pre-announced the launch of an EU-China Energy Cooperation Platform to support the implementation of actions and projects that

632 *Ibidem.*

633 EU-China Leaders' Statement on Climate Change and Clean Energy, Beijing, July 16, 2018, https://ec.europa.eu/clima/sites/clima/files/news/20180713_statement_en.pdf.

634 Zhongguo dui Oumeng zhengce wenjian (中国对欧盟政策文件, China's Policy Paper on the European Union), Zhongyang zhengfu menhu wangzhan (中央政府门户网站), December 28, 2018, http://www.gov.cn/guowuyuan/2018-12/18/content_5349904.htm.

635 *Ibidem.*

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dealt with energy.[636] The Platform, which was formally established on May 15, 2019, is certainly a good starting point for further discussion on common challenges in the fight against global warming.

These initiatives show that energy dialogue is not only possible, but that it also creates synergies between the different policies of Europe and China. Nevertheless, as we have noted throughout this manuscript, it is impossible to remain blind to the differences between the respective strategic visions of the European Union and China in relation to energy cooperation. The direction in which this cooperation will develop is still largely contingent on China's approach. If they wish to urgently modernize their energy system, they will either have to provide international companies that want to play a greater role in the development of the system with more transparent market conditions or continue to rely only on their own resources. Remaining aware of these differences can and probably should be treated as an opportunity that will induce both sides to seek more flexible avenues of cooperation in the future. This is how the changes that we have witnessed over the past years should be interpreted.

4. EU standards vs. China's position under the international climate change regime

For China, access to the European Union's experience in energy demand management and storage opens up the possibility to reduce both its own energy consumption and manage energy demand more efficiently. The issue of optimizing energy consumption in cities is particularly salient here. The main feature of this optimization process is the need to develop and effectively implement multidimension action plans to make energy consumption more sustainable on multiple fronts. This perspective on sustainable energy involves not only ensuring universal access to energy but also, crucially, improving the efficiency of energy production and consumption and increasing the share of renewable energy production in the energy mix – a particular sign of the times. Both parties attach great importance to the development of renewable energy, treating it as key ingredient in their efforts to improve their own energy security, promote sustainable development, and combat climate change.

If we take United Nations Framework Convention on Climate Change as the starting point for an assessment of efforts in this area, we can already state that most of the world's countries have taken action to curb the negative effects of

636 Joint Statement on the Implementation of EU-China Energy Cooperation, Brussels, April 9, 2019, https://ec.europa.eu/energy/sites/ener/files/documents/joint_statement_on_the_implementation_of_the_eu-china_cooperation_on_energy_en.pdf.

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climate change.[637] This is also the case for the European Union, which seeks to reduce greenhouse gas emissions by reducing energy consumption in transport (mainly based on the European Emissions Trading Scheme, or EUR ETS), promoting the development of renewable energy, and improving energy efficiency. These efforts go hand in hand with the steady decline in primary energy production observed in the EU. In 2017, primary energy production was more than 12 % lower than a decade prior. In the course of these ten years, the share of RES in energy production has increased by 65.6 % while the share of fossil fuels has decreased significantly.[638] On the one hand, this is due to the depletion of local fossil fuel resources; on the other, it is the fruit of effective implementation of EU-wide environmental and climate policy. The measures in question were implemented simultaneously with improvements in energy efficiency, active promotion of clean and renewable energy sources, and a reduction of the share of coal in the energy mix. There is no doubt that the decision of some EU member states to withdraw from nuclear energy will further reduce the diversity of Europe's internal energy mix.

Table 26. Production of primary energy, EU–28, 2017 (% of total, based on tons of oil equivalent)

Renewable energy	29.9
Nuclear energy	27.8
Solid fossil fuels	16.4
Natural gas	13.6
Crude oil	8.8
Other	3.5

Source: Eurostat, *Energy production and imports*, June 2019, https://ec.europa.eu/eurostat/statistics-explained/index.php/Energy_production_and_imports#Production_of_primary_energy_decreased_between_2007_and_2017

Despite these efforts, the European Union remains a significant net primary energy importer. This is best illustrated by the increase in its dependence on energy imports from 44 % in 1990 to 52.9 % in 2007 and 55.1 % in 2017. It is important to note that the EU's imports are concentrated in only a few countries of origin. Russia alone accounts for 38.9 % of imported coal, 30.3 % of oil, and 38.7 % of natural gas. In total, almost three quarters of the gas imported into the EU comes from Russia, Norway, and Algeria. Similar trends occur in the case of

637 United Nations Framework Convention on Climate Change, United Nations, FCCC/INFORMAL/84 GE.05–62220 (E) 200705, https://unfccc.int/resource/docs/convkp/conveng.pdf.

638 Eurostat, *Energy production and imports*, June 2019, https://ec.europa.eu/eurostat/statistics-explained/index.php/Energy_production_and_imports#Production_of_primary_energy_decreased_between_2007_and_2017.

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solid fuels, which mainly enter the EU markets from Colombia, the United States, and Australia. It is therefore not surprising that, in 2019, the EU's dependence on oil, gas, and solid fuel imports amounted to 86.7 %, 74.3 %, and 43.9 %, respectively.[639] This structure compels the Union to actively support the diversification of not only energy sources, but also supply routes. It is also a product of the 20–20–20 targets set by the European Union in 2007 in the field of energy and climate change, whose goal was to reduce greenhouse gas emissions by 20 % (with an option to increase the reduction to 30 %), increase the share of renewable energy in the energy mix to 20 %, and improve energy efficiency by 20 % by 2020.[640]

In its Communication titled "A policy framework for climate and energy in the period from 2020 to 2030" (February 4, 2014), the European Commission set out its energy policy objectives for 2030.[641] The EC foresees a 40 % reduction in greenhouse gas emissions across the EU compared to the 1990 baseline as well as an increase in renewable sources' share of energy consumption to 27 %.[642] In another communication, published on June 14, 2018, the European Commission, the European Parliament, and the EU Council agreed on a new directive on renewable energy sources, according to which the share of RES in the EU's energy mix in 2030 was to increase to 32 %, with a review clause allowing it to be adjusted upward in 2023.[643] These goals correspond with the "Energy Roadmap 2050" adopted in December 2011. Anchored in the decarbonization of the energy system, increasing energy efficiency, and the growing role of RES, the Roadmap outlined various scenarios for building a competitive and low-carbon economy by the middle of the century. It signaled that the EU is ready to reduce greenhouse gas emissions by up to 80–95 % compared to 1990 levels.[644]

This ambitious goal illustrates and confirms that Europe has always wanted to play an active role in the development of alternative energy sources. Climate change policy has been and continues to be a way for the Union to boost its

639 Eurostat, *Energy production and imports*, June 2019, https://ec.europa.eu/eurostat/statistics-explained/index.php/Energy_production_and_imports#Production_of_primary_energy_decreased_between_2007_and_2017.

640 2020 climate & energy package, https://ec.europa.eu/clima/policies/strategies/2020_en.

641 Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, A policy framework for climate and energy in the period from 2020 to 2030, January 22, 2014, COM (2014) 15 final 2, https://eur-lex.europa.eu/legal-content/PL/TXT/PDF/?uri=CELEX:52014DC0015rom=EN.

642 *Ibidem.*

643 Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Energy Roadmap 2050, December 15, 2011, COM(2011) 885 final, https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52011DC0885&from=EN.

644 *Ibidem.*

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attractiveness in the international arena. However, one must acknowledge that it will not be easy to maintain this position today, given that the locus of the development of many new technologies has shifted to other parts of the world. One of them is China, which whose expenditure on the development of green energy, including wind and solar energy, is the highest in the world.[645] As a result, authorities in Beijing are finding it increasingly difficult to see the EU as a leader in the global fight against climate change.[646] While China has responded positively to offers of cooperation from the EU in the first decade of the 21st century, it has remained incapable of giving too much in return and/or unwilling to do so, seeing as the EU is struggling to push through its ambitious climate targets on its own ground, as noted by David Belis and Simon Schunz.[647]

There is no better illustration of how dramatically the landscape has shifted than the fact that China is more and more often portrayed as the leader of the global fight against climate change. Surveys conducted among delegates and observers of the COP (Conference of the Parties) of the United Nations Framework Convention on Climate Change show that the European Union, the United States, and China are now most often identified as the leading voices in this struggle. Nevertheless, the EU has seen a marked drop from 62 % to 41 % over the course of seven years (see table below). Respondents were much more likely to point to the U.S. and China, whose result has improved from 47 % to 54 %. Overall, however, these results illustrate the absence of a single unquestionable leader in climate change – a situation that Charles F. Parker, Christer Karlsson, and Mattias Hjerpe describe as a "fragmented leadership landscape."[648]

Interestingly, further studies by the authors cited above have shown that the EU has more influence on the negotiation agenda than on the final outcome. For example, the EU failed to convince participants in the 2009 Copenhagen negotiations to support a binding agreement on top-down targets and timetables. But only six years later, in Paris, it managed to negotiate a legally binding global agreement with China and the U.S. that set out a roadmap to limit global warming to below 2 °C. The key to success turned out to be a more flexible EU strategy that involved accepting bottom-up promises on reduction combined with a top-down

645 *Clean Energy Investment Trends 2018*, Bloomberg NEF, January 16, 2019, https://data.bloomberglp.com/professional/sites/24/BNEF-Clean-Energy-Investment-Trends-2018.pdf, p. 42.

646 Jonathan Holslag, *China's Scepticism of Clean Energy Champion Europe*, "The International Spectator" 45(1) (2010), p. 115–130.

647 David Belis / Simon Schunz, *China and the European Union: Emerging Partners in Global Climate Governance?*, "Environmental Practice" 15(3) (2013).

648 Charles F. Parker / Christer Karlsson / Mattias Hjerpe, *Assessing the European Union's global climate change leadership: from Copenhagen to the Paris Agreement*, "Journal of European Integration" 39(2) (2017), p. 244.

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Table 27. Recognition of leadership in the fight against climate change, 2008–2015 (%)

	COP 14	COP 15	COP 16	COP 17	COP 18	COP 19	COP 20	COP 21	Trend
	2008	2009	2010	2011	2012	2013	2014	2015	2008–15
EU as leader	62	46	45	50	51	48	48	41	-21
China as leader	47	48	52	50	48	42	48	54	+7
G-77 as leader	27	22	19	33	24	25	22	27	0
U.S. as leader	27	53	50	42	39	42	42	59	+32

Source: Charles F. Parker / Christer Karlsson / Mattias Hjerpe, *Assessing the European Union's global climate change leadership: from Copenhagen to the Paris Agreement*, "Journal of European Integration" 39(2) (2017), p. 245.

performance review.[649] This shows (if indirectly) that Beijing has ceased to interpret the EU's climate change proposals as an attempt to interfere in China's domestic affairs.[650]

For a long time, Europe's approach to China in terms of promoting pro-environmental solutions resembled a teacher-pupil relationship. Relying on its extensive experience, Brussels hoped that it would be able to encourage China to establish a new partnership and, in exchange for the transfer of know-how, obtain political or at least commercial concessions from China. The EU did not seem to understand that China is guided by its own national interest and, sacrificing universal standards in favor of developing a traditional form of diplomacy oriented towards the interests of its own state and its own economy. In this context, it is crucial for China to fight pollution in its own backyard rather than to try to meet global challenges, especially given the differing experiences of different countries. It is also significant that, by stressing the importance of North-South cooperation, China avoids being perceived as a front man legitimizing the Western contribution to solving the problems of the Global South.

Although it originally called for broader top-down binding targets and timetables to take precedence over voluntary commitments by individual countries, the EU has now changed its approach and, by adopting a more flexible (realistic) stance, managed to find a compromise in Paris in 2015. Its new found pragmatism derives from the fact that China now has much greater economic potential and has strengthened its international position significantly. This is why the authorities in Beijing are trying to take more responsibility in international affairs, including climate change. However, one should keep in mind that China still believes that

649 Ibidem, p. 239–252.

650 Jonathan Holslag, *China's Scepticism of Clean Energy Champion Europe*, *op.cit.*, p. 125–127.

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Europe and the United States are using climate change to maintain their global political and economic hegemony. In the meantime, given that the global center of energy production is shifting toward North America while its consumption is shifting to East Asia and Europe, it is becoming increasingly obvious for China that cooperating with the United States and the European Union is a win-win approach.

However, from China's perspective, one sign of the European Union's weakness is the lack of coherence in the policies it implements, not only at Community level but also – and perhaps even primarily – on the part of the member states. The latter play an increasingly important role in the development of EU environmental policy in general and climate policy in particular. However, nation states, guided by their particular interests, are pushing supranational interests to the background on the grounds of needing to maintain economic growth, protect their own industry, or ensure the competitiveness of their domestic enterprises.[651] As a result, the issue of an energy strategy that emphasizes the development of renewable energy sources is becoming increasingly politicized.[652] This is clearly illustrated by the opposition to and objections against the promotion of energy from renewable sources during discussions on the EU's climate and energy policy objectives for 2030.[653] This pushes China to treat not the European Union, but its member states as the main partners for dialogue and compels it to focus on bilateral negotiations.

Nonetheless, China does not simply rely on bilateral inter-state dialogue as a kind of magic wand with which it can successfully tackle climate change – hence the European Union's efforts to find multilateral solutions. However, it is critical to note that the two sides approach the these efforts from different starting points. Brussels hopes that this formula will enable it to have (at least) an indirect impact on China in the context of international negotiations on climate change. For Beijing, on the other hand, a critical goal is to gain access to Europe's advanced environmental technologies. The assertive position that China maintained over the years has clearly demonstrated its inability to comprehend the EU's ambitious targets for reducing greenhouse gas emissions – so much so that China ultimately proposed its own methodology for reducing carbon dioxide emissions per unit of GDP. Still, the country's perpetually high rate of economic growth means that emissions will not necessarily fall. China does not consent to

651 Aleksandra Kułaga, *Polityka klimatyczno-energetyczna Unii Europejskiej*, "Przegląd Europejski" 2(32), (2014), s. 105–121.

652 *Energy Policy Making in the EU: Building the Agenda*, Jale Tosun / Sophie Biesenbender / Kai Schulze (eds.), Springer-Verlag, London 2015.

653 Helge Jörgens / Israel Solorio, *The EU and the promotion of renewable energy – An analytical framework. Comparing Europeanization and Domestic Policy Change in EU Member States* [in:] Israel Solorio / Helge Jörgens (ed.), *A Guide to EU Renewable Energy Policy*, Edward Elgard Publishing, Cheltenham-Northampton 2017, p. 4.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

international monitoring of these emissions, proposing instead their own pilot carbon trading schemes and developing clean energy technologies on their own turf.

Since diplomatic relations were established in 1975, Brussels has designed its cooperation with China on the energy front around the provision of aid first and foremost, in line with the European development strategy. As a result of its efforts, China has received support for experimental projects while providing only limited funding for these projects itself. However, official messaging either did not emphasize or completely marginalized the role of the EU's financial commitment. Yet it was this external support that not only enabled China to gain access to capital and technology, but also indirectly shaped its image as a responsible member of the international community.[654]

While the Chinese side has focused its attention primarily on acquiring the most advanced technologies, their European counterparts emphasizes the practical dimensions of applying selected technologies in the Middle Kingdom. This is because China's numerous violations of intellectual property rights has cast a shadow over efforts to strengthen cooperation. European companies naively expected China to give them the same level of IPR protection as they receive in Europe. But they were wrong, and China remains a follower (or perhaps a replicator) rather than a leader in the development of new technologies. It continues to hold a relatively low position in the global supply and value chain,[655] which is why the government in Beijing has stressed the need to link foreign direct investment with the transfer of more advanced technologies.

Although European companies make their best effort to protect their technological knowledge, most of them tacitly accept the possibility of technological leakage in exchange for access to the Chinese market.[656] According to an annual survey presented in May 2019 by the EU Chamber of Commerce in China, based on a survey of entrepreneurs, the number of cases of technology transfer from EU companies active in China is gradually increasing. Foreign operators are forced to make their own technology available in exchange for access to the Chinese market. This was the response selected by 20 % of the respondents to the survey, compared to 10 % two years earlier. Nearly a quarter of the businesses that admit to having been forced to transfer their technology also said that similar practices

654 Frans-Paul van der Putten / Chu Shulong (ed.), *China, Europe and International Security: Interests, Roles, and Prospects*, Routledge, London–New York 2012, p. 54.

655 Kirsten Bound / Tom Saunders / James Wilsdon / Jonathan Adams, *China's Absorptive State: Research, innovation and the prospects for China-UK collaboration*, Nesta, London, October 2013, https://media.nesta.org.uk/documents/chinas_absorptive_state_0.pdf.

656 David Bennett at all., *Technology Transfer to China: A Study of Strategy in 20 EU Industrial Companies*, "International Journal of Technology Management" 21(1/2) (2001).

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

are in place today, with 39 % of them stating that such transfers have taken place in the last two years.[657]

The contrasts between the two parties are even more stark in the normative sphere. The EU's endeavors in sharing its experience on environmental protection and the common fight against climate change with China have so far taken place under the assumption that the EU is predestined to act in a normative way on the international scene. This perception is based on the EU's understanding of its normative power. According to Ian Manners, who introduced this notion ('normative power Europe') into political circles, the European Union diffuses values that form its own normative bedrock, such as peace, freedom, democracy, human rights, rule of law, equality, social solidarity, sustainable development, and good governance.[658] Hence, EU policy is based on the promotion of certain norms, principles, and values in relation to the external environment, using specific soft policy instruments to shape this environment. Its strength is therefore based not on military or economic factors but on the importance of the ideas, norms, and values that underpin European integration.[659]

This diffusion has long been framed as a vehicle for modernizing trends, and the Union's experience served as an illustration (and perhaps even a model) of how to deal with the challenges of globalization.[660] Thus, cooperation with China in promoting sustainable development was based primarily on the idea of constructive engagement on the part of the two players. Intensified contact with the outside world was meant to foster the conviction among the Chinese elite that being part of the international community meant that the country had to commit to caring for the fate of the world, however lofty that goal may sound. However, this approach did not always fall on very fertile land in the Middle Kingdom. There were clear normative differences that significantly influenced bilateral cooperation. Brussels' actions were seen as attempts to influence China and transform it according to the pattern set by European values.[661] On its part, China was selective in allowing the European perception of normative action to filter in.

657 Michael Martina, *China's tech transfer problem is growing, EU business group says*, Reuters, May 20, 2019, https://www.reuters.com/article/us-china-eu/chinas-tech-transfer-problem-is-growing-eu-business-group-says-idUSKCN1SQ0I7.

658 Ian Manners, *Normative Power Europe: A Contradiction In Terms?*, "Journal of Common Market Studies" 2(40) (2002), p. 235–258.

659 Anna Skolimowska, *Normatywna potęga Unii Europejskiej w obliczu umiędzynarodowionych konfliktów wewnętrznych*, Elipsa, Warszawa 2015, p. 11–12.

660 Paweł J. Borkowski / Małgorzata Smutek, *Polityka zagraniczna Unii Europejskiej w warunkach kryzysu i fragmentaryzacji* [in:] Tomasz Grzegorz Grosse (ed.), *Polityki europejskie w dobie kryzysu*, Scholar, Warszawa 2016, p. 61.

661 Pan Chengxin, *Problematizing "Constructive Engagement" in EU China Policy* [in:] Roland Vogt (ed.), *Europe and China: Strategic Partners or Rivals?*, Hong Kong University Press 2012, p. 37–58.

ISBN Print: 9783847112112 – ISBN E-Lib: 9783737012119

For the Middle Kingdom, the logic of cooperation mainly comes down to monitoring and adopting innovative solutions in the field of energy in exchange for greater openness toward European companies on its internal market.

The arrangements made between the EU and China on climate protection take on special importance when weighed against President Trump's announcement in mid-2017 that the United States would be withdrawing from the Paris Agreement, which supplements the United Nations Framework Convention on Climate Change. This step has significantly weakened the Agreement, sending a negative signal to other countries that it is possible to challenge previously adopted arrangements. It is therefore safe to assume that the joint engagement of the EU and China on implementing the 2015 provisions will be decisive in the fight against climate change. The EU and China are not only the world's largest energy consumers, but together account for more than a third of global carbon dioxide emissions – 28 % and 10 %, respectively, while the US accounts for only 14 %.[662]

Finally, it is impossible not to notice that China has been acting as a spokesperson for developing countries for years, championing the notion that climate negotiations are not equitable because there has been no progress in defining developed countries' commitments toward developing countries. Perhaps this perspective would not have been heard if it weren't for the fact that the Middle Kingdom, as the second largest contributor to the UN system, is increasingly influencing the shape of environmental programs in Asia and Africa. The Belt and Road Initiative is linked to the United Nations Environment Programme (UNEP) and other UN agencies via the Belt and Road Initiative International Green Development Coalition (BRIGC), which was announced in 2017. Thus, by lending its face to the fight against climate change, China has apparently come to believe that its stands not only to promote green development, but also bolster its own economic growth. With its ambition of becoming the largest producer and exporter in the renewable energy sector as well as a leading player in the emissions trading market, China is demonstrating that climate diplomacy is also becoming an extremely effective geostrategic tool in modern times.

662 International Energy Agency, *CO_2 emissions from fuel combustion 2019 highlights*, https://iea.blob.core.windows.net/assets/eb3b2e8d-28e0-47fd-a8ba-160f7ed42bc3/CO2_Emissions_from_Fuel_Combustion_2019_Highlights.pdf.

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Table 28. CO_2 emissions in China, the United States, and the European Union, 1990–2017

		1990	1995	2000	2005	2010	2015	2017	% change 1990–2017
China	CO_2 from fuel combustion (MtCO2)	2122.2	2936.8	3140.0	5448.9	7874.7	9145.3	9302.0	338.3 %
	Share of world CO_2 from fuel combustion	10 %	14 %	14 %	20 %	26 %	28 %	28 %	
United States	CO_2 from fuel combustion ($MtCO_2$)	4803.1	5073.9	5729.9	5703.2	5352.1	4928.6	4761.3	-0.9 %
	Share of world CO_2 from fuel combustion	23 %	24 %	25 %	21 %	17 %	14 %	14 %	
European Union	CO_2 from fuel combustion ($MtCO_2$)	4024.2	3812.2	3786.3	3922.8	3612.6	3216.1	3209.3	-20.3 %
	Share of world CO_2 from fuel combustion	20 %	18 %	16 %	14 %	12 %	10 %	10 %	
World	CO_2 from fuel combustion ($MtCO_2$)	20521.1	21387.2	23 239.8	27074.8	30571.4	32430.9	32839.9	60 %
	Share of world CO_2 from fuel combustion	100 %	100 %	100 %	100 %	100 %	100 %	100 %	

Source: International Energy Agency, *CO_2 emissions from fuel combustion 2019 highlights*, https://iea.blob.core.windows.net/assets/eb3b2e8d-28e0-47fd-a8ba-160f7ed42bc3/CO2_Emissions_from_Fuel_Combustion_2019_Highlights.pdf

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