

# 9

## Conclusions

### *Coherence, Management, Legitimacy, and Effectiveness in the Climate-Energy Nexus*

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Combating climate change and transitioning to fossil-free energy systems are two central planetary challenges humanity faces today. The two challenges strongly overlap in their substance and the political choices we have to address them. As a consequence, a plethora of international institutions – public, private, and hybrid ones – fall right into this overlap. They seek to regulate the many complex linkages between climate change and decarbonized energy systems.

The introduction to this volume stressed the urgency of researching these links at the nexus of global climate change governance and energy governance. The highly complex and fragmented nature of the climate-energy governance nexus confronts us with a series of questions that need timely responses. How coherent is this governance nexus – in terms of the memberships, functions, core norms, and interactions across its numerous institutions? How have states, international organizations, and other actors responded to this complexity when they sought to tackle coherence and governance gaps? How does institutional complexity affect the legitimacy and effectiveness of individual institutions and the governance of the climate-energy nexus as a whole? Or, to concentrate these concerns into one question: to which degree do the many governance efforts on climate change and energy transition today add up to a coherent regulatory and institutional global framework?

It has been the purpose of this book to provide first and crucial answers to these questions and to alert a wider audience to their importance. In Section 9.1, the concluding chapter summarizes some of the novel findings from our research. The summary is by no means exhaustive, and we refer the readers back to the previous chapters for the rich, cross-dimensional, and comparative insights they provide. Our research findings show us in great detail what is at stake and how carefully institutions and stakeholders need to navigate in the complexity of the climate-energy nexus with its many and emergent governance arrangements. Against this backdrop, this chapter also discusses possible explanations of our results

(Section 9.2) and derives policy recommendations from them (Section 9.3). It also points to some of the next steps we need to take as researchers and stakeholders in order to live up to the tall order of tackling climate change and energy transition simultaneously (Section 9.4).

## 9.1 Findings

This section is organized along the main components of the analytical framework introduced in Chapter 2. The major backbone of the framework are four evaluative themes or analytical dimensions to grasp the shape and performance of institutions in complex governance systems: coherence, management, legitimacy, and effectiveness. Each of these evaluative themes was operationalized through particular dimensions.

To examine the four themes, the framework combined both rationalist and constructivist accounts derived from theories of International Relations. Coherence and management were to a large extent scrutinized along organizational dimensions such as institutional membership and governance functions. The dimension of the core norm, however, added an important constructivist dimension to the analysis of coherence. For the two themes that concern performances under conditions of complexity, i.e. legitimacy and effectiveness, the authors mostly relied on a constructivist or sociological perspective. They examined perceptions and expectations by selected audiences and stakeholders involved in international negotiations on energy and climate.

In addition to this dual approach, the framework distinguished three analytical levels to get a more encompassing grasp on the climate-energy nexus: the macro level (the climate-energy nexus as a whole); the meso level (the institutional complexes that govern each of the nexus's subfields analyzed in this volume, namely renewable energy, fossil fuel subsidy reform [FFSR], and carbon pricing); and the micro level (specific interlinkages between individual institutions within each of these subfields).

### 9.1.1 Coherence

Coherence was defined in Chapter 2 as the degree of harmony or compatibility of institutional features to one another or to an overarching purpose. This theme was studied along four dimensions: institutional membership, coverage of governance functions, adherence to an overarching core norm, and interaction mechanisms. Two of these dimensions (membership and functions) were analyzed across all three analytical levels. The other two were only scrutinized for the meso level (core norm) and micro level (interaction mechanisms), respectively.

In Chapter 3, Sanderink and colleagues advanced a novel and unique dataset. They mapped the institutions across the entire climate-energy governance nexus at the macro level and examined in great detail the *membership* distribution of public, civil society, and firm-based members. The database they generated contains 108 institutions, which include more than 12,000 members as of early 2017. Through their network analysis, the authors identified the International Renewable Energy Agency (IRENA) and the United Nations Framework Convention on Climate Change (UNFCCC) as the central institutions within the climate-energy nexus, due to their high degrees of universality and inclusiveness.

By the same token, Sanderink and colleagues found for the climate-energy nexus a clear dominance of public members, i.e. country, state, or municipal governments, secretariats to international agreements, and other public agencies. These are involved in no less than seventy-eight institutions and exclusively constitute forty-eight of these, with cities being by far the most frequent type of public member. While the predominant number of public members come from developed countries, public actors from various countries in the global South, such as China, Mexico, and Indonesia, have become widely represented across the nexus. By contrast, firm or business actors are members of less than half of the sample (fifty-one institutions), and only make up seventeen institutions exclusively. Civil society actors are officially engaged in solely thirty-five institutions, seven thereof being purely civil-society-based.

When disentangling these overall observations for the three selected policy subfields, the contributions to this volume equally identified a predominance of public actors, albeit with certain variations across issue areas. As Sanderink demonstrated in Chapter 4, the renewable energy subfield of the nexus exhibits the most institutions of the three cases, forty-six in total. The membership distribution across these institutions mirrors that of the climate-governance nexus as a whole. Twenty-eight of the forty-six renewable energy institutions are solely constituted by public members. Apart from the UNFCCC and IRENA, these include, for instance, the International Energy Agency (IEA), the Association of Southeast Asian Nations, and the Covenant of Mayors. No more than four institutions are merely firm-based and only three are purely civil-society-based, with the remaining eleven institutions featuring mixed memberships.

For fossil fuel subsidy reform, Verkuyl and van Asselt in Chapter 5 identified an even greater imbalance in favour of public actors. The institutional complex is made up of only fourteen institutions, thirteen of them purely intergovernmental, e.g. the UNFCCC, IEA, the United Nations Environment Programme (UNEP), the Friends of Fossil Fuel Subsidy Reform (Friends), and the World Bank. The only exception is the Global Subsidies Initiative, which was started by a Canadian NGO.

By contrast, Skovgaard and Canavan found a nearly balanced distribution for the subfield of carbon pricing (Chapter 6). Of the thirteen institutions they identified for this complex, five were solely public (e.g. the UNFCCC or the International Carbon Action Partnership [ICAP]), four firm-based (e.g. the International Emissions Trading Association [IETA] and the Verified Carbon Standard), and one, the Gold Standard, constituted by civil society actors, with the three remaining ones being hybrid institutions.

For the second dimension of coherence, *governance functions*, Chapters 2 and 3 differentiated four major dimensions to guide the empirical analyses in this volume: standards and commitments, operational activities, information and networking, and financing. At the macro level of the climate-energy nexus as a whole, Sanderink and colleagues (Chapter 3) found that all these four governance functions were institutionally covered. This notwithstanding, there was no clear division of labour evolving across the nexus as a whole. Instead, they identified a rather uneven distribution of functions. The climate-energy nexus is dominated by institutions that perform information and networking functions, while, for instance, standard-setting and financing are conducted by a much smaller set of institutions. Institutions with public members are clearly in the majority when it comes to information and networking functions. Interestingly, though, the number of public and firm-based institutions is nearly equal for the setting of standards and commitments. Put differently, a key observation is that soft-governance functions – such as information and networking – dominate at the expense of hard-governance functions that involve authoritative rule and standard-setting. Clearly, states are not willing to cede sovereign control of rule-setting on energy to global institutions.

When zooming in on the meso level and comparing the three selected cases, this picture changes and gets more differentiated. The subfield of renewable energy again comes closest to the research findings from the climate-energy nexus as a whole. In Chapter 4, no clear cross-institutional division of labour of governance functions can be found. Instead, global renewable energy governance is geared toward information and networking functions that are dominated by public institutions.

For the subfield of fossil fuel subsidy reform, by contrast, the distribution of institutions across governance functions is much more balanced. As Verkuijl and van Asselt observe in Chapter 5, this is partly the result of active coordination by international organizations and country governments. Some forums are instrumental in agenda-setting and the formulation of commitments (e.g. the Group of Twenty [G20] and Friends), while others concentrate on the provision of information (e.g. the Organisation for Economic Co-operation and Development [OECD] and the IEA) or on financing and implementation on the ground (e.g. the World Bank and the Global Subsidies Initiative).

For the third case study on carbon pricing, Skovgaard and Canavan established yet a different picture, namely one of considerable overlaps over certain

governance functions. For instance, ICAP (intergovernmental), IETA (business), and the Networked Carbon Markets Initiative (NCM; hybrid) engage in very similar information and networking activities to promote the linking of carbon markets. However, in all subfields rule- and standard-setting is a less predominant governance function, which reflects that sovereign states have a solid grip on decision-making power in energy governance.

As a third dimension to analyze the degree of institutional coherence in the nexus, Chapter 2 identified the *core norm*, i.e. the overarching expectation of appropriate behaviour that characterizes a particular subfield. The concept is closely related to the very definition and delineation of a subfield and its respective institutional complex. It provides the substance or goal that unites the institutions governing the area in question. Although the institutions agree on the importance of the norm, they may interpret its precise content and application in strongly diverging ways (see also Wiener 2004). The interpretation of the core norm therefore served as the major benchmark for identifying normative convergence or divergence at the meso level.

For renewable energy, Sanderink (Chapter 4) identified Sustainable Development Goal 7.2 as the core norm, which aspires to substantially increase the share of renewable energy in the global energy mix, especially with a view to ensuring access to, and availability of, clean energy for all (United Nations 2015). The universal nature of this norm notwithstanding, Sanderink ascertained a considerable normative divergence and contestation across the subfield. Only seventeen of forty-six institutions subscribe to the norm literally, while the others prioritize specific aspects over others, i.e. either climate change mitigation, energy access, or energy security.

For fossil fuel subsidy reform, Verkuijl and van Asselt (Chapter 5) found a similar, if not even more divergent picture. They also referred to a key institutional document as the most suitable expression of the core norm, in this case taken from the statement of the third leaders' summit of the G20 in Pittsburgh 2009: to '[r]ationalize and phase out over the medium term inefficient fossil fuel subsidies that encourage wasteful consumption' (G20 2009, paragraph 29). Verkuijl and van Asselt caution that the key terms in this formula remain contested across actors and institutions, including what should be counted as fossil fuel subsidies in the first place. Moreover, phase-out dates remain ambiguous across the institutional complex. In addition, the United States under the Trump administration has begun to voice overall reservations on the FFSR norm in general. Against this backdrop, it is not surprising that the authors found no major institution to which all others would normatively adhere to.

Normative divergence and contestation, rather than convergence, also mark the institutional complex on carbon pricing (Chapter 6). As a core norm for this subfield, Skovgaard and Canavan established that climate change is best mitigated

by giving a price signal to emitters and by leaving the decision of how to reduce carbon emissions to the market. This said, they identify no less than four aspects along which the interpretation of this norm considerably varies across the complex. These four aspects are: quantity versus price instruments, mandatory versus voluntary schemes, carbon pricing within a given jurisdiction versus off-setting, and whether polluters should pay for all of their emissions or not. Variation in institutional positions concerning these four aspects creates normative clusters of largely private institutions on one side and hybrid or public ones on the other.

The fourth and final dimension of coherence introduced in Chapter 2 regards the interaction *mechanisms* at the micro level of individual institutions. Three types of mechanisms were distinguished through which individual institutions may have an impact on each other within the climate-energy nexus: cognitively, through a flow of knowledge and information; normatively, through an imitation of, or adaptation toward, norms and rules; or behavioural, through the functional or strategic behaviour of specific members or other actors.

Chapters 4–6 found plenty of evidence for all three mechanisms being at play in the three institutional complexes, with no particular dominance of one over the others. Yet, given the aforementioned overall dominance of information and networking functions in the climate-energy nexus, it was arguably easier to identify cognitive interactions than normative interactions. Behavioural interactions depend in part on the overlaps of memberships across institutions. To give one example: in the institutional complex on FFSR (Chapter 6), their membership in both the G20 and the Asia Pacific Economic Cooperation (APEC) allowed the United States and China to push successfully for reform commitments and peer-review efforts in both intergovernmental institutions. Such reform efforts included events and initiatives linked to the UNFCCC, the High-Level Political Forum on Sustainable Development, and the World Trade Organization (WTO). This form of forum shopping (cf. Raustiala and Victor 2004; Orsini et al. 2013) has played an important role in increasing the saliency of FFSR on the international policy agenda.

### 9.1.2 Management

The second evaluative theme, management, was specifically targeting the micro level, i.e. relations among individual institutions within a given subfield of the climate-energy nexus. Quoting Stokke (2001, 11), Chapter 2 defined management as any deliberate efforts taken ‘by participants in tributary or recipient regimes to prevent, encourage, or shape the way one regime affects problem solving under another’. The chapter distinguished two main dimensions for assessing such efforts. First, the levels (regional, national, global) and agents (domestic or

sub-domestic actors, one or several affected institutions, or an overarching institution(s) of management; and second, the actual consequences and potential successes of management efforts. In other words: did the management attempts yield any convergence about the core norm or entail any sensible and efficient distribution of memberships and governance functions across the affected institutions?

Notably, all three case studies identified a variety of effective management attempts for the particular institutional interlinkages they put under scrutiny. This signals a strong awareness by institutional members and third parties of the complexity in which they are operating. In Chapter 4 on renewable energy, Sanderink concentrated her micro-level analysis on three hybrid institutions, i.e. partnerships made up by all three major stakeholder types (public, firm-based, civil society). For all three of them – the Renewable Energy and Energy Efficiency Partnership, The Renewable Energy Policy Network for the 21st Century (REN21), and Sustainable Energy for All – she found management attempts initiated by different drivers at various levels. For example, joint coordination efforts between the three institutions included a shared portal and a joint report for common information. Further convergence was reached through unilateral management approaches, with each partnership reaching out toward important third institutions, e.g. IRENA. Finally, Sanderink identified the UNFCCC and Agenda 2030 as overarching institutions that provide core global goals upon which the three partnerships converge. These diverse management activities notwithstanding, she stressed an important limitation of her micro-level study. In light of a total of forty-six institutions and a dominance of public institutions in the renewable energy subfield, the relations between the three hybrid institutions selected should not be mistaken as representative of the management attempts in this institutional complex. In fact, Sanderink found that, aside from the three partnerships that she examined, only thirteen other institutions explicitly link their activities to the UNFCCC and Sustainable Development Goal (SDG) 7.

The results of the micro-level studies were slightly more representative for the two other case studies, FFSR and carbon pricing, since these two subfields exhibit a much lower number of institutions. For the institutional complex on FFSR (Chapter 5), consisting of but fourteen institutions, Verkuijl and van Asselt studied three key intergovernmental institutions in depth: G20, APEC, and Friends. They largely identified informal management efforts between these three and their members, taking the form of meetings on the side during international events, outreach to Friends members for their expertise, and outreach from Friends members to other countries in advance of G20 summits. Despite this informal character, or likely because of it, the management attempts were very effective, since they facilitated the information flow and kept the level of ambition high across the three institutions. Friends members in particular adopted a broker role

and proactively enhanced complementarity among the three institutions. For instance, developments at the G20 gave New Zealand, a Friends member, leverage to ensure that similar efforts were undertaken under APEC, in terms of both reform commitments and the introduction of a peer review process in this area.

For their micro-level examination on carbon pricing in Chapter 6, Skovgaard and Canavan arguably chose the most powerful institutions among the thirteen that constitute the meso-level institutional complex. When analyzing interactions between the UNFCCC and World Bank–embedded institutions, they determined various joint management efforts. Such efforts mainly took place through regular, yet often informal, contacts and meetings between institutional officials that are specialized in carbon pricing questions. These experts helped to defuse situations that could potentially have led to open competition or conflict. On the other hand, and unlike for renewable energy and FFSR, Skovgaard and Canavan did not find any noteworthy unilateral or overarching attempts by particular states or institutions to manage carbon pricing. Moreover, most management attempts for this policy field have originated in an ad hoc or incremental manner rather than going back to deliberate and long-sighted planning. On balance, the institutional sample for carbon pricing thus features less encompassing management efforts than the samples in the other two case studies.

Table 9.1 summarizes the major findings for the two evaluative themes of coherence, and management across the three institutional complexes for renewable energy, FFSR, and carbon pricing. The left column lists the various dimensions, while the three columns on the case studies clarify to which extent these dimensions were addressed in a coherent manner, i.e. whether or not the three subfields exhibit high and balanced scope of memberships, functions, interaction mechanisms, a convergence on core norms, and a high and effective scope of management efforts. The bottom row includes our overall assessments of the shape and direction of the institutional complexes for each subfield. The terminology for this overall assessment (here: coordination for all three cases) is guided by the book's analytical framework (see Chapter 2, Table 2.1) that distinguishes largely non-managed from largely managed institutional constellations under different degrees of coherence.

Our findings indicate that all three subfields are characterized by coordination, rather than competition or outright harmony. This reflects the aforementioned results for coherence and management. On the one hand, all three policy subfields exhibit a medium degree of normative and functional convergence. The institutions in each of them share a certain core norm, for example phasing out inefficient fossil fuel subsidies, but differ considerably in their interpretations of that core norm. While all institutions in each subfield cover all governance functions, they are frequently skewed toward information and networking at the expense of standard-setting, and

Table 9.1 *Findings for coherence and management in the climate-energy nexus.*

<i>Evaluative Themes</i>	<i>Nexus Subfields</i>		
	<i>Renewable Energy</i>	<i>Fossil Fuel Subsidy Reform</i>	<i>Carbon Pricing</i>
<b>Coherence</b>			
Scope and distribution of memberships (meso)	46 institutions Imbalance, dominance of public institutions (28)	14 institutions Imbalance, strong dominance of public institutions (13)	13 institutions Balanced distribution (5 public, 4 firm-based, 1 civil society-based)
Scope and distribution of governance functions (meso)	High Imbalanced distribution in favour of information & networking	High Balanced and complementary distribution	High Balanced, but competitive distribution
Convergence on core norm (meso)	Low to medium Strong variations across goal priorities	Low to medium Strong variations on the core definition of fossil fuel subsidies	Medium Strong variations across goal priorities and approaches to reach these goals
Scope and distribution of interaction mechanisms (micro)	High All types (cognitive, normative, behavioural)	High All types (cognitive, normative, behavioural)	High All types (cognitive, normative, behavioural)
<b>Management</b>			
Scope of efforts across agents and levels (micro)	High Both formal and informal Largely joint and unilateral, partly overarching	High Mostly informal Joint, unilateral and overarching	Medium Both formal and informal, but largely ad hoc Largely joint, no major unilateral or overarching efforts
Consequences (micro)	Facilitating convergence	Facilitating convergence	Preventing competition
<b>Overall Assessment</b>	<i>Coordination</i>	<i>Coordination, evolving division of labour</i>	<i>Coordination</i>

public actors are over-represented compared to private stakeholders. On the other hand, all three cases exhibit diverse and relatively successful management attempts across key institutions, with a certain caveat regarding renewable energy where more studies are needed to scope out this relatively large institutional complex.

The combination of these two qualities – medium coherence and advanced management – suggests that the meso-level institutional complexes on renewable energy, FFSR, and carbon pricing fulfil notions of ‘coordination’. The differences across the three subfields are, hence, rather minor. FFSR comes closest to a division of labour, due to the widespread management efforts amongst a small number of institutions and the balanced distribution of governance functions across these institutions. The institutional complex on carbon pricing, on the other hand, depends upon ad-hoc management efforts to prevent outright competition or conflict across institutions.

### 9.1.3 Legitimacy

Moving from the shape or degree of institutional complexity to its consequences, the remaining two evaluative themes of legitimacy and effectiveness have been conceptualized in sociological terms, i.e. they are measured by perceptions among key audiences and stakeholders. To this end, the analyses relied on interviews and questionnaires to explore how certain actors perceive the legitimacy and effectiveness of selected institutions in the three policy areas that we put under scrutiny in this volume.

To examine consequences of institutional complexity for legitimacy, Chapters 2 and 7 introduced a total of nine dimensions. The dimensions capture criteria from the diverse scholarship on legitimacy concepts (normative and sociological, input and output legitimacy), that were geared to be analyzed in terms of perceptions among key stakeholders. They include five dimensions of input legitimacy (an institution’s expertise, inclusiveness, procedural fairness, transparency, and accountability) and four dimensions of output legitimacy (produced output, behaviour-changing outcome, problem-solving impact, and distributive fairness).

In Chapter 7, Nasiritousi and Verhaegen advanced this novel framework, guided by theoretical assumptions and expectations on the legitimacy perceptions of these dimensions (see also Section 9.2). The framework was employed to empirically examine five selected institutions in the subfield of renewable energy: the UNFCCC, IEA, IRENA, the Clean Energy Ministerial (CEM), and REN21. To get reliable results from a broad set of stakeholders, an expert survey was conducted with 262 respondents, and analysed by performing an exploratory factor analysis for the 9 dimensions. The findings are presented and visualized in detail in Chapter 7, differentiated by different stakeholders and institutions.

We can only highlight some of the general findings on legitimacy perceptions among key stakeholders for the renewable energy subfield. One core finding is that the UNFCCC was regarded as the most legitimate institution in the sample, while the Clean Energy Ministerial (CEM) received the least positive legitimacy assessment across the nine dimensions, with a noteworthy margin to the other four institutions. Moreover, the UNFCCC scored higher compared to any other institution with regard to dimensions of input legitimacy. An explanation can be that the UNFCCC is the only multilateral institution with a political mandate in the institutional complex on renewable energy, and thereby has the most elaborated procedures to promote access, inclusiveness, and transparency in particular. Apart from these observations, however, it is striking how similar the overall legitimacy assessments by key stakeholders were for the five institutions. Importantly, this suggests that stakeholders do not adequately disentangle their views of individual institutions from their overall impression of the renewable energy subfield – at least not for those institutions that have similar functions, feature overlapping mandates, and regularly engage in interactions and management efforts.

When distinguishing the results according to different subsets of stakeholders, though, Nasiritousi and Verhaegen found that an institution's formal fulfilment of normative legitimacy criteria does not necessarily translate into positive legitimacy assessments by all actors. Rather, the varying specializations and backgrounds of stakeholders led to significant variations in legitimacy assessments – owing to differences in their normative orientations, value sets, and familiarity with certain institutions. In this context, the professional background was much more significant for legitimacy assessments than the geographical origins of respondents, which on balance did not render any significant differences.

#### *9.1.4 Effectiveness*

Three dimensions of effectiveness were differentiated in Chapter 2, and applied in Chapter 8: the institutions' production of information, norms, and policies (output), the effect on institutional members and their behaviour (outcome), and the ultimate effect on solving the climate- or energy-related problem that the respective institutions sought to address (impact) (cf. Underdal 2002; Tallberg et al. 2016).

These were identical with the three-tiered legitimacy dimensions discussed in the previous section on legitimacy. What set the study in Chapter 8 apart from that in Chapter 7 was, first, that a broader sample was analyzed, namely across all three institutional complexes – renewable energy, fossil fuel subsidy reform, and carbon pricing. Second, the empirical examination of effectiveness combined both document analyses and qualitative data on the perceptions and expectations of experts (derived from interviews).

A core finding was that all three institutional complexes are relatively successful in producing outputs, especially in terms of information-sharing and capacity-building. Achievements on the outcome and impact levels were harder to establish, but the overall evidence suggested that none of the institutional complexes has been capable of substantially mitigating the collective action problems they set out to address. Not surprisingly, the interviewees called for more coordinated approaches for all three issues to build common narratives and promote a certain division of labour across institutions.

Disentangling these general insights for each of the three subfields showed that institutional complexity can be a supportive as well as hindering factor for effectiveness in the climate-energy nexus. For renewable energy, the interviewees expected more advantages than disadvantages from the institutional complexity in this subfield. This goes in particular for the output level, with benefits arising from multiple perspectives and knowledge bases and thanks to a pragmatic compartmentalizing approach to master different challenges of the energy transition. The most frequently named disadvantages, on the other hand, included: duplication of work; competition over resources, influence, and visibility; and the lack of an umbrella institution to address these issues.

A similarly positive assessment of effectiveness by core audiences was established for the institutional complex on fossil fuel subsidy reform. Similar to renewable energy, respondents viewed the availability of different types of expertise and experiences across the various institutions as highly beneficial, especially for output effectiveness. With regard to outcome, the different memberships of institutions working on FFSR helped to widen the geographical spread of governance efforts on this issue. In addition, interviewees welcomed a race to the top or positive reinforcement arising from institutional plurality, i.e. the incentive to keep or surpass the level of ambition of other institutions in the field. The disadvantages that were most frequently mentioned coincided with those for renewable energy, namely duplication of work and competition among standards at the output level, implying considerable transaction costs and ambiguity regarding outcome effectiveness.

These arguments about the consequences of institutional complexity were more or less repeated for carbon pricing. On the positive side, respondents stressed the knowledge distribution for output effectiveness, as well as positive reinforcement effects and stronger outreach activities for outcome effectiveness. Disadvantages that the interviewees referred to were equally similar to the other two subfields: the competition among standards and the conflicting messages this sends to stakeholders. Importantly, and in comparison to renewable energy and FFSR, these negative implications for carbon pricing were highlighted quite frequently by respondents. This confirmed the aforementioned findings on coherence and management for this

subfield, which suggested a somewhat more competitive nature of the institutional complex. The findings for effectiveness echoed this notion and suggest that the degree and consequences of this competitiveness merit further exploration.

## 9.2 Explanations

As laid out in Chapter 1, this edited volume first and foremost has sought to provide new conceptual and empirical insights into the shapes and consequences of institutional complexity for the nexus of two major policy domains, climate change and energy. Given the lack of previous comparative studies about the climate-energy nexus, this book combined a series of innovative methods and research steps, which, in turn, generated a large set of important and novel research findings for scholars and practitioners alike. In the following, we briefly focus on possible explanations for these findings on the four evaluative themes of coherence, management, legitimacy, and effectiveness.

### *9.2.1 Explaining Coherence and Management in the Climate-Energy Nexus*

Chapter 1 briefly proposed one explanation for variation across the subfields on coherence and management, namely the position of each subfield within the climate-energy nexus. The variation in this position also served as one of our main criteria for selecting the three case studies for this volume. Carbon pricing is mainly connected to climate change, with mitigation as its core objective. Renewable energy, on the other hand, is more at the heart of energy governance, as a policy subfield primarily seeking to promote a segment of energy sources, while mitigating climate change comes as a co-benefit or secondary goal. Fossil fuel subsidy reform, finally, falls somewhere in the middle of the two other subfields, as it is both an instrument for climate mitigation and for de-carbonization of the energy mix.

In Chapter 1, we expected that these different positions of our three case studies within the climate-energy nexus would matter for the coherence of the respective institutional complexes – especially since climate change governance was, unlike energy governance, marked by a central institution, the UNFCCC, as a hub of multilateral climate diplomacy (Biermann et al. 2009; Van de Graaf and Colgan 2016). This central position, and possibly coordinative influence of the UNFCCC, would make it well-equipped to play a stronger role for predominantly climate-related topics such as carbon pricing.

However, when looking at the findings for coherence and management, as displayed in Table 9.1, these expectations were not supported by the empirical

evidence. Instead, in spite of their very different positioning in the climate-energy nexus, all three institutional complexes share a number of institutional features, such as wide coverage of different governance functions, dominance of public institutions (albeit to different degrees), and low or medium convergence on core norms, as well as multiple and effective management attempts. Consequently, they score similarly in the overall assessment of ‘coordination’, i.e. they exhibit a relatively well managed, medium level of coherence.

What is more, the convening, steering or orchestrating role that the UNFCCC plays in global climate governance in general did not have the expected impact for the subfield of carbon pricing. On the contrary, Skovgaard and Canavan (Chapter 6) found no evidence for any management attempts by the UNFCCC for this subfield. Rather, as Sanderink showed in Chapter 4, the UNFCCC provides such an umbrella function for some of the institutions governing renewable energy.

At second glance, however, the positioning in the climate-energy nexus appears to play some role for shaping the institutional complexes, albeit not the only or major role. For instance, the normative guidance that the UNFCCC provides for the renewable energy subfield affects a minority of institutions in the complex. Sanderink’s findings point to roughly one-third of institutions that adhere explicitly to core norms of the UN climate regime. By contrast, output from the UNFCCC, particularly the Kyoto Protocol and the Paris Agreement, have historically often acted as stimuli for scaling up efforts across the carbon pricing subfield.

This said, the potential relevance of the nexus position for the degree of institutional complexity may be considerably qualified by other factors. In the case of carbon pricing, for instance, one reason for the slightly more competitive nature of the complex (e.g. with regard to the distribution of governance functions) is the constellation between the UNFCCC on the one hand and World Bank–embedded institutions on the other. These two sets of international institutions differ, for instance, in their confidence in the ability of the market to yield carbon-emission reductions (Chapter 6). While this constellation confirms the important role that the UNFCCC has for this subfield, it shows that, for a more differentiated explanation, other phenomena have to be taken into account.

Concretely, the climate-energy nexus does not exist in a vacuum, but overlaps with other policy domains with their own institutional settings. Carbon pricing is not only a matter of climate change and energy, but also of financing and international development, which explains the significant role the World Bank plays in balancing the UNFCCC’s dominant position in this subfield. Likewise, renewable energy is linked to a plethora of economic, environmental, and social concerns that are in part regulated by other institutions. It is hence not surprising that renewable energy is governed by the biggest institutional complex in our

sample. This high number of institutions, in turn, implies both challenges and opportunities that may impact the institutional features of the complex, from more options to cover governance functions on the one hand to more difficulties to reach overarching coordination on the other (Scott 2008; Biermann et al. 2009).

These considerations about thematic scope and the number of institutions demonstrate the need for more theory development in order to explain and understand the variation of institutional features in a governance nexus. This development can build, *inter alia*, on different theories on international institutions who continuously incorporated the phenomenon of institutional complexity over the past two decades. Rationalist, sociological and discursive accounts of institutionalism yield different theoretical expectations that could be adapted to the study of a governance nexus such as the one on climate and energy. Among the rationalist approaches, proponents of instrumental multilateralism could, for instance, analyze the role of hegemonic countries in determining which core rules are adopted, which governance functions are covered and which management attempts are taken by which actors or institutions (cf. Ikenberry 2003; Morse and Keohane 2014). Likewise, neoliberal institutionalists and organizational ecologists could scrutinize the role of underlying constellations of interests or situation structures (cf. Zürn 1993; Keohane and Victor 2011), problem structures (cf. Rittberger and Zürn 1990; Underdal 2002; Zelli et al. 2017), or resource dependencies (cf. Abbott et al. 2016) in shaping certain areas of a governance nexus. Sociological and discursive institutionalists, finally, could help us understand to what extent the (lack of) institutional coherence in a nexus represents overarching norms or discourses – and the rivalries and contestations among them – in which the various institutions are embedded (cf. Conca 2006; Schmidt 2008, 2017; Arts and Buizer 2009).

### *9.2.2 Explaining Legitimacy and Effectiveness in the Climate-Energy Nexus*

In Chapter 7, Nasiritousi and Verhaegen examined a variety of potential reasons for the legitimacy assessments by stakeholders. They followed Steven Bernstein and other scholars who have shown that different types of stakeholders may hold different legitimacy demands based on their social values, norms, and previous experiences (Bernstein 2005; Karlsson-Vinkhuyzen and Vihma 2009; Lenz and Viola 2017). Nasiritousi and Verhaegen therefore examined whether varying stakeholder characteristics made a difference for legitimacy assessments under conditions of institutional complexity. For their sample of five renewable energy institutions, they found that some of these characteristics indeed mattered for legitimacy assessments. These assessments particularly varied between

governmental and nonstate actors and between stakeholders with different work profiles and orientations. The geographic origin, on the other hand, played no major role for how the legitimacy of an institution was valued. These results indicate that norms, values, and experiences of audiences may be of relevance for the sociological legitimacy of institutions in a nexus.

In addition, Nasiritousi and Verhaegen took into account the degree of institutional complexity as a potential explanation for shaping audiences' legitimacy beliefs. Following cognitivist assumptions about limitations of visibility and shadows of legitimacy in highly complex governance systems (cf. Alter and Meunier 2009; Bäckstrand *et al.* 2018; Zelli 2018), they examined whether such systems may make it too difficult for stakeholders to differentiate between the processes and performances of individual institutions. The climate and energy nexus, which brings together a large variety of institutions, provides such a complex environment.

The authors indeed found evidence that stakeholders in their sample did not adequately disentangle their legitimacy assessments of the individual institutions under scrutiny, since these overlapped in mandates and governance functions. Moreover, they found that a stakeholder's level of familiarity with an institution can be linked to a more positive assessment of legitimacy. Hence, there are reasons to believe that knowledge or valuing of an institution provides important markers or mental shortcuts for stakeholders when they navigate a very complex and densely populated subfield such as renewable energy.

These findings on legitimacy regard a small sample from only one of the three subfields of the climate-energy nexus. Future research has to show whether the institutional complexes on fossil fuel subsidy reform and carbon pricing exhibit similar levels of sociological legitimacy. On the one hand, one could expect such similarities, since, as we summarized earlier in this chapter, all fields exhibit comparable degrees of coherence and management. On the other hand, the governance systems on FFSR and carbon pricing are made up of considerably less institutions, which may qualify the impact of institutional complexity on stakeholder assessments.

Chapter 8 analyzed whether the institutional complexity of the three subfields affected various experts and stakeholders in how they assess the effectiveness of certain institutions. The analysis revealed many similar assessments across the subfields, in spite of the institutional differences among them, e.g. the much higher number of institutions for renewable energy than for FFSR and carbon pricing. The main disadvantages that experts and stakeholders in all three subfields highlighted were duplication of work, conflicting messages, and competition, which were all seen as obstacles in the way toward stronger synergies. On the other hand, institutional complexity offered more opportunities and venues to include a broader spectrum of actors and interests.

Potential explanations for these results may be related to our findings for legitimacy and call for further research. One could expect, for instance, that the social values, norms, and experiences that impact legitimacy assessments also play a role in effectiveness assessments. What speaks for this assumption is that the three dimensions of institutional effectiveness (output, outcome, impact) are also relevant dimensions for the output legitimacy of institutions.

An explanation for the differences found in assessments of effectiveness between the three subfields may be the overall level of complexity in a subfield as a more fundamental reason, and the respective explanations for coherence and management discussed in the previous section (Section 9.2.1). The position in a subfield in the climate-governance network or, for instance, the underlying constellations of interests, may not only shape the degree of complexity of that subfield, but also the (perceived) advantages and disadvantages arising from that complexity. All these potential connections point to the need for a groundbreaking research programme – one that provides scholars and stakeholders with novel, theory-driven analyses to explain and understand the complexity of a nexus and its consequences for legitimate and effective governance.

## 9.3 Recommendations

### *9.3.1 Enhancing Coherence and Management in the Climate-Energy Nexus*

The ensuing recommendations are based on the empirical results of Chapters 4–6 of this volume. These chapters present three case studies on three major subfields of the climate-energy complex: renewable energy, fossil fuel subsidy reform (FFSR), and carbon pricing. The studies found that all three subfields, and the institutional complexes that govern them, are marked by medium coherence; minimal or low levels of management; and significant challenges, trade-offs, and conflicts. Given this similarity across the three subfields, our most important recommendations apply to all of them, and they are also of relevance for a wider universe of subfields within the climate-energy nexus that show similar levels of coherence.

First of all, improving coordination and building awareness of the activities of institutions is important for avoiding duplication of efforts and conflicting messages. Such conflicting messages may create confusion among relevant actors. They also provide alternatives for those actors that are opposed to certain policies and institutional efforts, helping such actors to ‘shop around’ for a different arena more suited to their preferences. Ultimately, conflicting messages may lead to

conflicting impacts of institutions. This happens intentionally when institutions promote specific objectives at the expense of other goals. An illustrative example comes from the renewable energy subfield. There, the energy trilemma poses a challenge to all international institutions working on this area – namely to achieve three objectives simultaneously – energy security, energy access, and sustainable energy – that frequently conflict with each other. Many institutions settle for prioritizing one of these goals, and there is, in fact, currently a clear bias in global renewable governance toward clean energy access (Sanderink 2019). Against this backdrop, and to avoid conflicting impacts, there is a strong need for a more integrated, cross-institutional acknowledgement of, and approach to, the energy trilemma. In particular, the potential of renewables to address energy security must be recognized more widely.

Duplication of work is a serious issue given that the institutions have limited resources in terms of staff, budget, and expertise. Improving coordination and awareness of each other's activities is key – and it does not necessarily call for a single institution that acts as orchestrator or coordinator. Rather, strengthening and expanding existing inter-organizational coordination mechanisms and possibly establishing new ones could improve oversight and integration. To identify the most urgent governance gaps, it is crucial to keep track of which institutions and actors are performing which tasks in which part of the world. Such a clearinghouse approach or information hub could be modelled on, for instance, the Global Climate Action portal of the UNFCCC (NAZCA 2019). Based on such continuous and cross-cutting information, institutions could then ideally adapt or shift their activities or mandates accordingly.

Second, we need clearer definitions. All three subfields we analyzed suffer from differing and even conflicting interpretations of central concepts and norms, such as what constitutes renewable sources of energy, fossil fuel subsidies, and carbon pricing. These diverging interpretations may lead to inconsistencies and tensions when pursuing core objectives. For instance, the various and competing definitions of fossil fuel subsidies entail considerable differences between estimates of annual global fossil fuel subsidization – ranging from several hundreds of billions by the OECD and IEA (OECD 2018a, 2018b) to several trillions by the IMF (Coady *et al.* 2017). Such definitional ambiguity among international institutions and their members has allowed some countries to maintain that they have no subsidies at all, even though there are numerous methodological aspects on which these institutions agree.

A possible solution to this ambiguity could be some form of joint 'minimum' definition put forward by all intergovernmental institutions on FFSR. Such a minimal but flexible consensus could leave the door open to complementary approaches such as those of the IMF, which highlights the broader societal costs

of government support for fossil fuels. Likewise, for the subfield of carbon pricing, diverging interpretations could be addressed by further specifying the norm of carbon pricing. A cross-institutional consensus could clarify that carbon pricing entails the payment of a non-trivial price for a significant share of emissions. Such a clarification could avoid conflicting signals and prevent carbon pricing schemes that only place a very low price on overall emissions. While such a clarification is strongly needed, it should still leave room for promoting both carbon taxes as well as emissions trading systems instead of just focusing on one of the two. Put differently, clarification is a balancing act. Too much norm or goal specification can come at the expense of a wider acceptance or support, particularly when competing definitions are rooted in actors' diverging preferences and worldviews.

Third, silo mentality should be avoided. Actors and institutions operating in the three subfields of renewable energy, FFSR, and carbon pricing should build stronger connections to other policy areas in the climate-energy nexus and beyond. For instance, the institutions in global renewable energy governance appear to compete with energy efficiency institutions over resources and visibility. Such competition can be in part prevented by separating opportunities for (financial) support and resources for renewable energy and energy efficiency, while simultaneously supporting collaborations between the two areas.

Another example of the need for stronger cross-area coordination is the importance of integrating fossil fuel subsidy reform within the UNFCCC (Skovgaard and van Asselt 2019). Moreover, in a broader sense of sharing experiences and spreading knowledge, institutions within the three subfields need to reach out to sectors and institutions beyond the climate-energy nexus. Many actors and institutions operating in other policy domains still need convincing of the urgency of a global energy transition toward renewables.

Fourth, certain institutions could act as orchestrators in order to facilitate these and other measures. To play such an orchestrator role, an institution would ideally have a broad membership and the convening power that comes with it, an extensive mandate, and a high degree of acceptance – qualities associated with major UN institutions – along with the organizational capacity to play such a role.

Within the renewable energy subfield, one candidate could be IRENA. Being positioned at the centre of the energy trilemma, it is one of the few renewable energy institutions that simultaneously promote energy security, energy access, and environmental sustainability concerns. Furthermore, IRENA's mandate to gather and disseminate comprehensive information would allow the organization to initiate a database on global renewable energy activities and to facilitate discussions on the benefits and shortcomings of various energy sources. Finally, having almost universal membership and being well-known as a focal point for renewable energy, IRENA can have convening power to invite institutions and

actors from areas other than energy governance to join renewable energy discussions. All this said, a major limitation is that IRENA – like the International Energy Agency that could potentially also play such a role – is not a UN organization, which may affect its acceptance as an orchestrator.

Within the subfield of fossil fuel subsidy reform, the UN Environment Programme (UNEP) is well-placed to take over the function of an orchestrator. UNEP coordinates efforts to bring together multiple stakeholders to develop a reporting methodology for SDG indicator 12.c.1 on fossil fuel subsidies. It may also play a valuable role in improving coordination and coherence between the institutions working in this area (UNEP et al. 2019). Furthermore, UNEP benefits from having a universal membership. Nonetheless, efforts to avoid duplication of work could also be undertaken by (a subset of) institutions independently. Given the WTO's existing definition of a subsidy, parallel efforts to promote FFSR through this forum also help socialize a common definition of a fossil fuel subsidy (Verkuijl et al. 2019).

For the subfield of carbon pricing, the two most obvious orchestrators are the UNFCCC and the World Bank. Yet, both of them suffer from specific shortcomings. The World Bank is an institution in which industrialized countries have disproportionate influence compared to the UN institutions, which limits its legitimacy particularly in the eyes of developing countries. The UNFCCC has much greater legitimacy in this respect, but is constrained by the modest resources of the UNFCCC Secretariat and the often-protracted decision-making procedures.

Some of these concerns are also relevant regarding a more general orchestration role within the larger climate-energy nexus. Despite the UNFCCC's relatively large secretariat, it cannot be expected to coordinate the institutional complex on climate change. It neither has the mandate nor the organizational capacity to do so. The secretariat has, however, been engaging in light-touch coordination using orchestration as a mode of governance. It collaborates with other institutions and actors to provide platforms and data that could help to mitigate cross-institutional coordination gaps (Hickmann et al. 2019).

### *9.3.2 Enhancing Legitimacy and Effectiveness in the Climate-Energy Nexus*

The feedback from selected experts in our surveys and interviews confirmed that greater cross-institutional coordination is also necessary to address some of the negative impacts of institutional complexity for the effectiveness in the climate-energy nexus. In line with the recommendations we outlined in the previous section, a more overarching and clear division of labour, reducing incongruence of messages, and facilitating greater information and data-sharing were all seen as

key steps by interview respondents. They cautioned, however, that diverging interests will keep rendering such efforts difficult. Moreover, coordination attempts would need to be designed in such a way as not to overburden the institutions with bureaucracy and to instead strike a balance between greater harmonization and maintaining the autonomy of institutions. Otherwise, effectiveness could be hampered by ill-designed coordination attempts. Here, key member states that are members of several institutions may have a role to play to push for improved coordination.

Effectiveness ultimately implies that the output of the many governance institutions contributes to actual problem-solving – i.e. successfully scaling up renewables, providing stringent carbon pricing, and phasing out of fossil fuel subsidies. As Chapter 8 showed, it is difficult to isolate and trace back the impact of the three institutional complexes on such problem solving, either because that impact is limited in the first place, or because of limitations in data. Nonetheless, there is considerable scope for improving problem-solving in each of the three subfields we analyzed. This includes enhancing the effectiveness of the measures that have already been brought on their way. In the case of carbon pricing, for instance, this would imply a stronger concentration on the adoption of carbon pricing and on effective carbon price levels, e.g. in line with the recommendations of the High-Level Commission on Carbon Prices (2017) that suggests prices between 40 and 80 US \$ per metric tonne of CO<sub>2</sub> equivalents.

Chapter 7 and its study of the legitimacy perceptions of five key institutions showed a significant variation across stakeholder groups. Against this backdrop, international institutions, first, need to apply different legitimization strategies to target different audiences and their varied interests. To be visible and reach various audiences in an increasingly crowded governance nexus, it is particularly important for international institutions to provide a credible picture of their purpose, procedures, and performance through multiple channels. The study differentiated the legitimacy assessments according to nine dimensions of institutional legitimacy, e.g. transparency, accountability, and procedural and distributive fairness. The responses on these dimensions provide a useful indication of which institutional qualities the five institutions need to communicate (and improve on) more extensively, in order to be perceived more positively by certain stakeholders.

Moreover, the study showed that stakeholders' familiarity with institutions matters for their sociological legitimacy. This points to the importance of outreach activities. Institutions operating in a dense institutional complex not only depend on performing their function well in order to be viewed positively, but also need to communicate and engage with a range of stakeholders, both members and non-members. Put differently, institutional complexity requires institutions to make

additional efforts to improve perceptions of their legitimacy in two different turfs: first, in an intricate institutional landscape through cooperation and competition with other institutions that have overlapping mandates; and second, in a more complex communication landscape with outreach activities directed at different audiences.

#### 9.4 Outlook

We conclude this chapter, and this book, with identifying urgent research gaps and future research avenues that we have repeatedly come across in our comparative and in-depth assessment of the climate-energy nexus. As Section 9.2 already includes our suggestions for further theory development on the analysis of a governance nexus, we concentrate our outlook on essential empirical questions of high relevance for researchers, policy practitioners, and stakeholders.

We structure our suggestions along our three case studies – renewable energy, fossil fuel subsidy reform, and carbon pricing – and the themes of legitimacy and effectiveness. There are cross-cutting aspects among them that point in the same direction, namely (1) to learn more about the causes of institutional complexity in the climate-energy nexus, and, more concretely; (2) to substantiate claims on the causal links between the degree of institutional complexity (in terms of coherence and management) and the implications of this complexity (in terms of legitimacy and effectiveness); (3) to identify conditions for successful management efforts and spill-over effects across institutions and levels and, while doing all this; (4) to go beyond renewable energy, fossil fuel subsidy reform, and carbon pricing, and expand studies toward other subfields in and beyond the climate-energy nexus.

For *renewable energy*, we need to know more about the interplay between renewable energy institutions and institutions from other energy-related areas, especially with regard to energy efficiency. Renewable energy and energy efficiency along with low-carbon technologies are key areas in decarbonizing energy systems and transitioning to fossil-free or carbon-neutral societies. However, as mentioned earlier, they more often than not compete in spite of their common vision. Moreover, and with a view to addressing the energy trilemma more appropriately, further research is required to explore how increased coordination efforts can take shape, and what role UN and non-UN organizations can play for this purpose, such as UNFCCC, UN Energy, IRENA, and IEA.

With respect to *fossil fuel subsidy reform*, one issue that could be examined in more depth is the interplay between limited-membership coalitions, such as the G20 or the Friends, and multilateral arenas. Such research could look into the extent to and conditions under which progress made in small-n settings can be integrated in multilateral decision making. Respective studies could draw on existing literatures in other areas, for instance on the role of regionalism in

international trade governance (Baldwin 2014). A second avenue for further research is to parse out the influence of international institutions on the implementation of domestic FFSR policies. As Chapter 5 discussed, countries have taken on commitments to reform their fossil fuel subsidies through various international forums, including the G20, the UNFCCC, the High-Level Political Forum, and Agenda 2030. The extent to which these international commitments trickle down to domestic action needs empirical assessment, through examining which countries have implemented reforms following the introduction of such commitments.

Future research on *carbon pricing* could, when exploring causes and consequences of coherence and management, focus more on the role of individual members (see also Andonova and Mitchell 2010). Regarding research on causes, one could analyze whether or not overlapping membership between institutions facilitates inter-institutional coordination – in particular through specific officials or units of a joint member. For instance, it is likely that the same states were to a large degree represented vis-à-vis the UNFCCC by their environment ministries (see Skovgaard and Gallant 2015), vis-à-vis the World Bank institutions by their finance and development ministries, and vis-à-vis CORSIA by their transportation ministries. Exploring the impact of identical or different negotiators in different institutions on overall coherence could provide both empirical and theoretical contributions important to academics and policy makers alike. In terms of consequences, future research should focus on whether and how the presence of interaction mechanisms between two institutions influenced the decisions of actors to adopt carbon pricing. If the relationship between two institutions became more coherent, did this also make them more influential toward their members? Comparisons of such constellations across time as well as across different subfields could provide insights of great policy relevance.

Concerning the connection between institutional complexity and perceptions of *legitimacy*, this book has provided a novel empirical study on five institutions from the subfield of renewable energy. First of all, this type of analysis could be expanded to institutions from other subfields. Such a wider examination can provide comparative insights into how the different levels of coherence across institutional complexes affect perceptions of legitimacy. Second, further research is required to establish why different stakeholders assess the legitimacy of institutions differently in a complex institutional environment. A broader set of potential explanatory factors could be put to the test here to examine whether these differences ultimately stem from processes of socialization or whether they are rather due to functionalist or rationalist reasons. Third, while we asked stakeholders to assess institutions according to nine dimensions of legitimacy, the next step would be to evaluate the relative importance that each stakeholder type assigns to each dimension. This would help to capture the overall legitimacy of an institution in greater detail. Such a research avenue could also explain and understand how

different dimensions of legitimacy relate to one another and which factors may lead to a legitimacy crisis. Fourth, and based on these insights, the role of specific legitimation and delegitimation strategies under institutional complexity merits further enquiry. Finally, our study focused on legitimacy at the micro level, i.e. for individual institutions. The next research frontier is to study how institutional complexity affects legitimacy for an entire institutional complex (meso level) or governance nexus (macro level).

With regard to *effectiveness* in the climate-energy nexus, our empirical findings indicate that output effectiveness, i.e. generating regulations and infrastructure, is high across the three institutional complexes for renewable energy, FFSR, and carbon pricing. However, behaviour-changing outcomes and problem-solving impacts of institutions were less significant in all three cases. Whether this is a result of institutional complexity, or perhaps a reflection of the limited authority of international institutions in these subfields, warrants further investigation.

Moreover, further research is needed to examine interactions across different subfields and how these affect the effectiveness of the climate-energy nexus (Sanderink and Nasiritousi 2019). On the domestic level, the three issues we scrutinized in this volume are often interlinked, e.g. in the sense that fossil fuel subsidies lower the de facto carbon price and make renewable energy less competitive. Likewise, renewable energy may provide a useful instrument for limiting potential negative consequences of FFSR and carbon pricing through energy access and rising energy prices. In turn, FFSR and carbon pricing may finance the expansion of renewable energy installations. Concerns about just transitions to a zero-emissions world (Newell and Mulvaney 2013) are relevant to all three issues and could benefit from addressing all three of them in a joint manner where possible.

Furthermore, studying other governance fields in a similar manner could provide a useful comparison to examine whether institutions in other policy domains have overcome some of the shortcomings of institutional complexity and why. Such research could help identify additional management options for international institutions to close governance gaps and enhance effectiveness in the climate-energy nexus. Finally, it should be noted that effectiveness as defined here does not capture the issue of efficiency. While the three subfields were all considered effective at the output level, future studies should also examine how economic efficiency can be improved under institutional complexity. This is important given strong competition over resources in different policy fields.

The governance of the climate and energy nexus, and the ability of its institutions to address key issues – such as renewable energy, fossil fuel subsidy reform, and carbon pricing – in a timely manner will have great consequences on people and the planet in the years to come. We therefore encourage scholars,

stakeholders, and practitioners alike to address the theoretical, empirical, and societal dimensions of the governance of the climate-energy nexus sooner rather than later. We hope that the research presented in this volume provides a first and crucial step to advance this important research frontier and to ultimately help resolve one of the largest planetary challenges ahead of us.

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