8

The Performance of the Climate-Energy Nexus

Assessing the Effectiveness of the Institutional Complexes on Renewable Energy, Fossil Fuel Subsidy Reform, and Carbon Pricing

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8.1 Introduction

What does institutional complexity mean for performance in the climate-energy nexus? As previous chapters have shown, the nexus is made up of a diverse set of institutions that have overlapping mandates and functions. Chapter 3 showed how the institutional complex varies at the meso level, and Chapters 4–6 explored the interactions between different institutions in three selected subfields: renewable energy, fossil fuel subsidy reform, and carbon pricing. Given the large number of institutions that operate and interact in these fields, several questions arise about their performance and environmental effectiveness: what are the consequences of this intricate web of institutions for the performance of the institutional complex of the climate-energy nexus? Is institutional complexity a requirement for effective problem-solving, or does it hamper effectiveness? What management options exist for making the institutional complex at the climate-energy nexus more effective? Considering the magnitude of the climate- and energy-related challenges, the answers to these questions are of great importance to both scholars and practitioners.

Based on these questions, and building on the previous chapters, the aim of this chapter is to assess the effectiveness of each of the three subfields as well as to discuss the overall performance of the institutional complex of the climate-energy nexus. As outlined in Chapter 2 and elaborated on in the next section, effectiveness here refers to how well institutions perform in terms of achieving goals that they have been tasked to fulfil. By examining the outputs, outcomes, and impacts of the three subfields, the chapter shows both the advantages and the disadvantages of institutional complexity of the climate-energy nexus for achieving effectiveness. It further shows that, despite the difficulties with evaluating effectiveness under institutional complexity, such an assessment is a worthwhile exercise in order to identify management options – i.e. options for formally regulating the linkage between institutions – for the climate-energy nexus.

The chapter proceeds as follows. The next section discusses the concept of effectiveness and the challenges to analyzing the effectiveness of institutions, especially when they have overlapping mandates and are interlinked. Thereafter, our methodology section outlines how, in order to respond to these challenges, our research relies on a two-track approach, integrating assessments by researchers and interviews with key stakeholders. Based on this information, we evaluate the outputs, outcomes, and impacts of institutions within each subfield. Thereafter, we examine what the consequences of institutional complexity are for the subfield in question. The insights gained from this analysis are then used to outline management options for the institutions of the climate-energy nexus. The final section concludes with discussing implications of our findings for the governance of the nexus at large.

8.2 Conceptualizing Effectiveness

As discussed in Chapter 2, effectiveness can be evaluated in different ways. Easton (1965) suggested measuring effectiveness across three dimensions: output, outcome, and impact. *Output* concerns performance in terms of what the institution produces, for example issuing regulations (binding or non-binding), producing reports, conducting research, organizing meetings, providing funding, offering training, etc. (Szulecki et al. 2011). *Outcome* relates to whether the institution produces behavioural changes, for example in terms of whether it increases the level of cooperation and compliance amongst members, for instance by improving learning and modifying incentives (Underdal 2002; Gutner and Thompson 2010). To determine an institution's *impact* implies assessing the extent to which the institution contributes to alleviating the problem it was tasked to resolve (Underdal 2002). Impacts may include effects that are positive or negative, direct or indirect, intentional or unintentional, and these can be short-, medium-, or long-term (Alcamo 2017). This threefold understanding implies that effectiveness is a stronger term than performance, since institutions can perform well in terms of output but nevertheless not achieve the intended impacts necessary for goal attainment.

Measuring effectiveness becomes increasingly difficult as the number of institutions rises. Even just for one institution, assessing effectiveness is challenging because of the need to establish causality between the output of the institution, the behavioural change among the target actors, and the impact on the problem that the institution was tasked to solve. This challenge is multiplied under institutional complexity because of the question of attribution, namely which institutions are responsible for observed impacts in a web of institutions with overlapping mandates? In short, under institutional complexity, the difficulties involved in

assessing effectiveness are compounded by challenges in identifying the division of labour between institutions (Alter and Meunier 2009).

Moreover, when evaluating impact for a field with multiple institutions, the analysis shifts from assessing goal attainment for individual institutions to assessing how the work of multiple institutions affects an overall goal, such as the fulfilment of Sustainable Development Goal (SDG) 7 on sustainable energy in the case of the renewable energy subfield. This approach is different from what can be found in much of the previous literature on effectiveness, where the focus is either on assessing institutional or environmental effectiveness (Underdal 2002; Gutner and Thompson 2010; Tallberg et al. 2016). Analyses of institutional effectiveness look at institutional performance, also including assessments of output legitimacy, such as the one presented in Chapter 7. Studies on environmental effectiveness, on the other hand, look at the extent to which specific institutions have an impact on environmental indicators. In contrast, the analysis in this chapter looks at the extent to which the collective contributions of individual institutions within a subfield are successful in fulfilling common goals in the subfield.

Some studies seek to circumvent the challenge of identifying outcomes and impacts of institutions by simply focusing on outputs (Szulecki et al. 2011; Tallberg et al. 2016). By examining outputs, these scholars assess the performance of institutions and thereby look at *potential* effectiveness. Alternatively, some studies analyze effectiveness by examining whether institutions are producing the outputs that could be expected, given the functions that they have (Pattberg et al. 2012; Chan et al. 2018). However, these approaches are at best useful as first steps and approximations for assessing the actual effects of institutions on the governance of particular issue areas.

The approach employed in this chapter instead seeks to link outputs to observed outcomes and impacts. For each subfield, our approach identifies specific outputs and discusses possible outcomes and impacts. While imperfect due to knowledge limitations, this approach makes explicit how assessments of effectiveness are made and thereby allows for critical reflection and learning about the cause and effect of institutional consequences. The aim of the analysis is hence not to show whether the institutions are effective or not but to discuss and specify in what ways they could be seen as effective (or not) and how institutional complexity affects effectiveness. The value of this approach lies in its context-specific analysis of outputs, outcomes, and impacts for each subfield and in deriving suitable management options to enhance effectiveness. Our own assessments are complemented by interview data from a range of stakeholders with high familiarity of institutions working within these subfields, as explained in the next section.

Assessing effectiveness across the three subfields (renewable energy, fossil fuel subsidy reform, and carbon pricing) was carried out by analyzing key documents and reports, as well as conducting semi-structured interviews with various experts. For the document analysis, we focused on academic journal articles but also included grey literature such as reports from international organizations and non-governmental organizations. For the interviews, we approached, for each subfield, representatives from national governments, international organizations, NGOs and academia. The interviewees were selected based on thematic expertise and knowledge of the institutions in each case study, with a view to cover a wide variety of actor types, countries and sectors. In total, thirty-eight interviews were carried out across the three subfields.

The interviews covered the following aspects: (1) the overall degree of effectiveness in the subfield; (2) possible bottlenecks that may hamper effectiveness; (3) influence of institutional complexity on effectiveness; and (4) management options by particular institutions to improve the effectiveness of the subfield. The analyses are based on a careful assessment of the data retrieved from the document analyses and the interviews. More specifically, output effectiveness was mainly determined based on the analyses in Chapters 4–6, whereas estimations of outcome and impact were mostly derived from academic and grey literatures. Findings about the influence of institutional complexity on effectiveness as well as management options are mainly based on the experts' views.

In what follows, we examine effectiveness, the consequences of institutional complexity and management options for each subfield at the meso level. The concluding section offers a comparison of the three subfields and draws out the implications of our findings for the performance of the institutional complex of the climate-energy nexus.

8.3 Assessments of Effectiveness for the Renewable Energy Subfield

8.3.1 Assessment of Outputs, Outcomes, and Impacts

A sustainable energy future hinges on a worldwide uptake of renewable energy. Many of the institutions that operate in the renewable energy subfield relate their work both to the SDG 7 target on clean energy and to the Paris Agreement's temperature target (Chapter 4). This section assesses the effectiveness of the densely crowded subfield for renewable energy.

First, with regard to output, Chapter 4 showed that the majority of renewable energy institutions focus on information-sharing through dissemination of research and publishing reports. Consequently, the renewable energy subfield displays a diversity of knowledge and expertise on energy sources and technologies from a

wide range of perspectives, which is frequently shared at various meetings, conferences, and platforms.[1] In addition, there are a fair number of renewable energy institutions working toward capacity-building and project implementation (see also Chapter 4). These particularly focus on deploying renewables for the purpose of expanding energy access in the developing world. Financing schemes, regulations, standards, and commitments are produced to a lesser extent.

Second, in terms of outcome, awareness and capacity are growing along a wide spectrum of stakeholders. For example, via renewable energy institutions, national governments are increasingly sharing experiences and taking note of best practices.[2] Simultaneously, nonstate engagement is spreading, which is illustrated by the growing number of private initiatives and multi-stakeholder partnerships for renewable energy (see Chapter 4). Businesses, trade associations, financial institutions, NGOs, and other civil society organizations show increasing interest in renewables. In short, renewable energy institutions appear to stimulate if not behavioural, then attitudinal changes amongst their members and beyond.

Third, assessing the level of goal attainment or problem-solving capacity suggests a low degree of effectiveness. Despite 2017 being a record-breaking year for the share of renewables in the global energy mix, the growth rate is currently falling short of meeting either the 'substantial increase' by 2030, as targeted by SDG 7, or the 2-degrees target set by the Paris Agreement (IRENA 2018; REN21 2018; United Nations 2018). It is difficult to determine the level of effectiveness based on broad perceptions, let alone for an institutional complex that includes such a high number of different institutions. This notwithstanding, the currently inadequate growth rate for renewables suggests that the subfield's institutional complex has suboptimal performance.[3]

Why is this the case? We could identify various bottlenecks through our interviews and literature review. First, the renewable energy subfield inherited the dominance of national policy making in global energy governance (Karlsson-Vinkhuyzen et al. 2012; Röhrkasten 2015; Van de Graaf and Zelli 2016). Even though renewable energy may be a less strategic issue for national security compared to traditional sources of energy, national governments have remained

[1] Interviews with T. Van de Graaf, Professor, Ghent Institute for International Studies, Ghent University, 13 July 2018; and G. Fernandez Ludlow, Director for Climate Change, E. M. del Pilar Casamadrid Gutiérrez, Director for the Environment and J. Alarcón González, Head of Department for Climate Change, Ministry of Foreign Affairs, Mexico, 3 July 2018.

[2] Interviews with G. Fernandez Ludlow, Director for Climate Change, E. M. del Pilar Casamadrid Gutiérrez, Director for the Environment and J. Alarcón González, Head of Department for Climate Change, Ministry of Foreign Affairs, Mexico, 3 July 2018; and M. Raamat, Counsellor on International Relations and Energy, Ministry of Environment, Estonia, 21 September 2018.

[3] Interviews with B. Sovacool, Professor of Energy Policy, Science Policy Research Unit, University of Sussex, 10 May 2018; and B. Hoskuldsson, Lead Partnership Specialist, Sustainable Energy for All (SEforALL), 21 September 2018.

hesitant to give up sovereignty.[4] Second, the subfield is steered by three different challenges, each of which controversial in its own right – energy security, energy access, and environmental sustainability – resulting in trade-offs and potential conflicts across institutions (see Chapter 4; Newell et al. 2011; and Röhrkasten 2015). Furthermore, there is no clear definition of what constitutes a renewable source of energy, leading to further controversies, for example related to nuclear power, bioenergy, and hydropower.[5] These aspects at least hinder the effectiveness of the subfield as a whole in terms of accelerating a renewables uptake. Several other bottlenecks relate to institutional complexity and are therefore discussed in the next subsection.

8.3.2 Consequences of Institutional Complexity: What Are the Implications for Renewable Energy?

To what extent can the low degree of effectiveness be attributed to the institutional complexity of the renewable energy subfield? Compared to the other two cases in this edited volume, carbon pricing and fossil fuel subsidy reform, the renewable energy subfield can be regarded as highly institutionally complex. The subfield is densely populated by a diverse set of institutions, which do not only differ in terms of their structural characteristics but also with respect to the functions they perform, the sources of energy and technologies they cover, and the challenges they seek to address (see Chapter 4). While this complexity makes it difficult to establish a causal relationship with the level of effectiveness, our interviewees on balance expect more advantages than disadvantages with institutional complexity.[6]

On the one hand, institutional complexity is considered to support effectiveness in two ways. First, the variety of institutions involved renders more comprehensive information available from a wide range of perspectives on renewable energy sources and technologies as well as on developments and innovations in the field.[7]

[4] Interview with T. Van de Graaf, Professor, Ghent Institute for International Studies, Ghent University, 13 July 2018.

[5] Interviews with S. Gsänger, Secretary-General, World Wind Energy Association (WWEA), Vice Chair, Renewable Energy Policy Network for the 21st Century (REN21), 9 May 2018; S. Singer, Advisor Global Energy Policies, Climate Action Network International, 10 May 2018; and S. Röhrkasten, Scientific Project Lead Pathways to Sustainable Energy, Institute for Advanced Sustainability Studies (IASS), 17 May 2018; and T. Van de Graaf, Professor at Ghent Institute for International Studies, Ghent University, 13 July 2018.

[6] Interviews with F. Van der Vleuten, Senior Energy Expert, Climate Team Ministry of Foreign Affairs, the Netherlands, 5 June 2018; B. Hoskuldsson, Lead Partnership Specialist, Sustainable Energy for All (SEforALL), 21 September 2018; and L. Williamson, Outreach and Communication Manager, Renewable Energy Policy Network for the 21st Century (REN21), 27 September 2018.

[7] Interviews with B. Sovacool, Professor of Energy Policy, Science Policy Research Unit, University of Sussex, 10 May 2018; G. Fernandez Ludlow, Director for Climate Change, E. M. del Pilar Casamadrid Gutiérrez, Director for the Environment and J. Alarcón González, Head of Department for Climate Change, Ministry of Foreign Affairs, Mexico, 3 August 2018; and M. Raamat, Counsellor on International Relations and Energy, Ministry of Environment, Estonia, 18 September 2018.

Second, institutional complexity provides the opportunity to disaggregate an intricate issue such as renewable energy into smaller challenges and to work on them in parallel with different degrees of progress.[8] Such a compartmentalizing approach has proven to be effective for the climate change realm and may be particularly suitable for a subfield such as renewable energy, characterized by the diversity of energy sources and technologies and differing challenges to tackle.

On the other hand, institutional complexity may turn out problematic for effectiveness in several ways. First, the interviewees express concerns about duplication of work and conflictive impacts among the renewable energy institutions.[9] With several institutions working on similar issues, it is sometimes unclear whether there are overlaps, or worse, incongruences, trade-offs, and conflicts between institutions (Biermann et al. 2009). As a consequence, it is difficult for national governments to decide which organizations, partnerships, and initiatives to participate in, and for the institutions themselves to identify thematic and functional gaps that need to be filled. Second, there exists competition over resources, visibility, sphere of influence, and media attention. This competition may involve institutions that target different renewable energy sources, but also institutions from related issue areas such as energy efficiency.[10] Third, there is no single institution with universal membership in the renewable energy subfield.[11] Such an institutional umbrella may, according to some observers, be ultimately necessary to achieve the common goal to substantially increase the share of renewables in the global energy mix. However, with 160 states as members and 23 in accession by 2019, IRENA is well on its way to positioning itself as one and to continue its unique multilateral success story in global (renewable) energy governance (Röhrkasten and Westphal 2013; Urpelainen and Van de Graaf 2015).

Yet, there is also a different perspective. Various scholars have recently argued that the emerging global transition toward renewable energy is not the result of deliberate and integrated international cooperation, but rather the result of an

[8] Interviews with T. Van de Graaf, Professor, Ghent Institute for International Studies, Ghent University, 13 July 2018; and L. Williamson, Outreach and Communication Manager, Renewable Energy Policy Network for the 21st Century (REN21), 27 September 2018.

[9] Interviews with F. Van der Vleuten, Senior Energy Expert, Climate Team Ministry of Foreign Affairs, The Netherlands, 5 June 2018; G. Fernandez Ludlow, Director for Climate Change, E. M. del Pilar Casamadrid Gutiérrez, Director for the Environment and J. Alarcón González, Head of Department for Climate Change, Ministry of Foreign Affairs, Mexico, 3 August 2018; and B. Hoskuldsson, Lead Partnership Specialist, Sustainable Energy for All (SEforALL), 21 September, 2018.

[10] Interviews with B. Sovacool, Professor of Energy Policy, Science Policy Research Unit, University of Sussex, 10 May 2018; S. Singer, Senior Advisor Global Energy Policies, Climate Action Network International, 10 May 2018; F. Van der Vleuten, Senior Energy Expert, Climate Team Ministry of Foreign Affairs, The Netherlands, 5 June 2018; B. Hoskuldsson, Lead Partnership Specialist, Sustainable Energy for All (SEforALL), 21 September 2018.

[11] Interview with T. Van de Graaf, Professor, Ghent Institute for International Studies, Ghent University, 13 July 2018.

organic proliferation of bottom-up initiatives (e.g. Aklin and Urpelainen 2018; Meckling 2019). Although it is difficult to assess the overall consequences of institutional complexity on effectiveness in the renewable energy subfield, our findings tend to support the argument that the current institutionally complex structure seems fitting, and perhaps even required, for the renewable energy subfield (see also Young 2002). Furthermore, there may be less of a need for institutional integration today than prior to 2015: with the Paris Agreement and SDG 7 agreed upon, '*discursively there is in any case a high degree of consensus*'.[12]

8.3.3 Management Options for the Renewable Energy Subfield

The general view among climate and energy experts interviewed is that the renewable energy subfield is functioning fairly well, institution-wise, partly guided by the targets and principles presented in the Paris Agreement and SDG 7.[13] This notwithstanding, there is a need for increased coordination among the renewable energy institutions to resolve the potentially negative implications of institutional complexity and, ultimately, to achieve targets to substantially accelerate the worldwide uptake of renewables.

First, it is necessary to map out existing renewable energy institutions, and their functions and targeted impacts, and to keep track of the progress being made.[14] This will help to prevent and resolve duplication of work and conflictive impacts and to identify docking points and gaps that need to be addressed among existing institutions. To clarify the latter, there is no need for new institutions trying to reinvent the wheel, but rather to find ways for collaboration to strengthen the overall outcome.[15] Second, with a plethora of knowledge and expertise comes a variety of scenarios, statistics, and data, based on a range of different methodologies and definitions that are not always compatible across institutions. In order to prevent and resolve competition among different measurements and related practices, more cognitive alignment and agreement is needed with regard to

[12] Quote (translated from Flemish to English) derived from interview with T. Van de Graaf, Professor, Ghent Institute for International Studies, Ghent University, 13 July 2018.

[13] Interviews with F. Van der Vleuten, Senior Energy Expert, Climate Team Ministry of Foreign Affairs, The Netherlands, 5 June 2018; T. Van de Graaf, Professor, Ghent Institute for International Studies, Ghent University, 13 July 2018; and B. Hoskuldsson, Lead Partnership Specialist, Sustainable Energy for All (SEforALL), 21 September 2018.

[14] Interviews with F. Van der Vleuten, Senior Energy Expert, Climate Team Ministry of Foreign Affairs, The Netherlands, 5 June 2018; G. Fernandez Ludlow, Director for Climate Change, E. M. del Pilar Casamadrid Gutiérrez, Director for the Environment and J. Alarcón González, Head of Department for Climate Change, Ministry of Foreign Affairs, Mexico, 3 August 2018; and L. Williamson, Renewable Energy Policy Network for the 21st Century (REN21), 21 September 2018.

[15] Interview with B. Hoskuldsson, Lead Partnership Specialist, Sustainable Energy for All (SEforALL), 21 September 2018.

methodologies to determine the uptake of renewables and to find some common understanding for what constitutes a renewable source of energy.[16] Finally, it is necessary to coordinate interaction and collaboration beyond the renewable energy subfield – with sectors that deploy renewables such as transportation and heating, but also with sectors that are reluctant to deploy renewables, as well as with the issue area of energy efficiency.[17]

While these coordination efforts appear feasible, these are merely desirable as long as they do not add another level to the management structures of renewable energy institutions.[18] Furthermore, coordination attempts should neither compromise the autonomy of institutions nor constrain them in their functioning and experimenting.[19]

8.4 Assessments of Effectiveness for the Fossil Fuel Subsidy Reform Subfield

8.4.1 Assessment of Outputs, Outcomes, and Impacts

There are persuasive economic, social, and environmental reasons to tackle fossil fuel subsidies. Over the past decade, more than a dozen international institutions have begun to address this issue from various angles, from information provision and agenda setting to capacity-building and financing of reform efforts.

Taken together, these activities have led to a range of outputs. Members of several forums – including the G7 (Group of 7), G20 (Group of 20), APEC (Asia-Pacific Economic Cooperation), Friends of Fossil Fuel Subsidy Reform (Friends), and the 2030 Agenda process – have expressed commitments to phase down fossil fuel subsidies, although the precise nature of the commitment varies (Chapter 5). The G20 and APEC have also put follow-up mechanisms in place, which allow countries to report on their subsidies, and to have them reviewed by their peers (APEC Energy Working Group 2013; G20 Energy Sustainability Working Group 2013). One key requirement for reform is to ensure an adequate understanding of the scale and impacts of fossil fuel subsidies. Resources such as the Organisation for Economic Co-operation and Development (OECD) and International Energy

[16] Interview with T. Van de Graaf, Professor, Ghent Institute for International Studies, Ghent University, 13 July 2018.

[17] Interviews with B. Sovacool, Professor of Energy Policy, Science Policy Unit, University of Sussex, May 10, 2018; S. Röhrkasten, Scientific Project Lead Pathways to Sustainable Energy, Institute for Advanced Sustainability Studies (IASS), 17 May 2018; and L. Williamson, Outreach and Communication Manager, Renewable Energy Policy Network for the 21st century (REN21), 27 September 2018.

[18] Interview with L. Williamson, Renewable Energy Policy Network for the 21st Century (REN21), 21 September 2018.

[19] Interviews with B. Sovacool, Professor of Energy Policy, Science Policy Research Unit, University of Sussex, 10 May 2018; and M. Raamat, Counsellor on International Relations and Energy, Ministry of Environment, Estonia, 18 September 2018.

Agency (IEA) Inventory of Support Measures for Fossil Fuels (OECD 2018a) and the International Monetary Fund's (IMF) post-tax estimates of fossil fuel subsidies (Coady et al. 2017) seek to shed light on this question. Drawing on such work, as well as the experience of their members and external experts, institutions such as the World Bank, IMF, APEC, and Friends have supported and facilitated workshops, events, and webinars to improve governments' understanding of reform.[20]

The outputs of these various institutions can, in turn, be linked to a range of observable outcomes. Reporting mechanisms introduced under the G20 and APEC have prompted members to provide information on their domestic subsidies, although overall such estimates have been much lower than expected (Asmelash 2016), with some countries even claiming to have no subsidies at all (Van de Graaf and Blondeel 2018). Since 2015, more than a dozen G20, APEC, and Friends members have also voluntarily undergone more in-depth peer- or self-reviews, or are in the process of doing so. While the results of these exercises have in some cases been considered disappointing (e.g. ODI 2017), they have, in other cases, facilitated concrete reform plans and timelines (e.g. China 2016). Moreover, it is likely that engagement in review itself can play a valuable role in increasing internal awareness about a country's subsidies and ways to address them.[21] Interviewees have also highlighted the helpful role of workshops and other capacity-building activities to strengthen countries' understanding of fossil fuel subsidy reform (FFSR).[22]

While international institutions' activities in the FFSR space can be associated with several outputs and outcomes, it is more difficult to determine to what extent their efforts have led to increased reform on the ground. At first glance, the data on national reform activities is promising. According to the IEA, global fossil fuel subsidies dropped by just over US $300 billion between 2009 (the year the G20 and APEC committed to phase out fossil fuel subsidies) and 2015 as a result of reform (IEA 2018). The Global Subsidies Initiative estimates that around forty countries underwent some sort of FFSR between 2015 and 2017 alone (Merrill et al. 2018).

In practice, however, there is limited knowledge about the role that an institutional complex as a whole, or even an individual institution, may have in driving such reform. Indeed, it is likely that low oil prices over the past years have contributed significantly to governments' decisions to adjust or remove the subsidies they provide to consumers of fossil fuels (Benes et al. 2015): while

[20] E.g. Interview with P. G Yoshida, former Lead Shepherd, Energy Working Group, APEC, 19 July 2018; and interview with senior official, Ministry of Foreign Affairs and Trade, Government of New Zealand, 9 August 2018.

[21] Interview with R. Steenblik, former Senior Trade Policy Analyst, OECD, 20 July 2018.

[22] Interview with senior official, Ministry of Foreign Affairs and Trade, Government of New Zealand, 9 August 2018; and interview with P. G. Yoshida, former Lead Shepherd, Energy Working Group, APEC, 19 July 2018.

consumption subsidies are currently in decline (Merrill et al. 2018), upstream production subsidies appear on the rise (OECD 2018a). Domestic fiscal pressures could be another key driver of reform (Skovgaard and van Asselt 2018). Yet, while in many cases such decisions may be taken independently from the international context, global developments may also help to inform decisions taken in this regard. Steenblik, for instance, notes that a focus on tax reform in China's 2016–2020 five-year plan may have been partially informed by the country's heightened awareness of shortfalls in its internal tax expenditure monitoring system, following its FFSR peer review under the G20.[23] This may suggest that capacity-building and information-sharing can play a more significant role than high-level international commitments in driving reform. Finally, it is worth bearing in mind that efforts to promote reform may take years to come to fruition (with possible setbacks along the way). As such, this analysis should be considered an initial indication, rather than a decisive assessment, of international institutions' contributions.

8.4.2 Consequences of Institutional Complexity: What Are the Implications for Fossil Fuel Subsidy Reform?

While the overall effectiveness of international institutions in FFSR is difficult to establish, the fact that multiple international institutions are active in this area appears to be largely advantageous for promoting reform.

One advantage of institutional complexity is that different international institutions are associated with different approaches and types of expertise, such as agenda setting, capacity-building, and research.[24] The efficiency of the FFSR institutional complex is strengthened by the fact that different organizations can contribute to FFSR efforts in their speciality area(s), as opposed to one institution needing to specialize in all these approaches. At the same time, the fact that multiple institutions are engaged in this area has likely helped ensure that more resources are dedicated to international reform efforts.[25] Having multiple institutions working in this area also provides FFSR advocates with increased opportunities to keep this topic on the international agenda, with the respective framing tailored according to the institution's financial, climate change, trade, or broader social mandate.[26]

[23] Interview with R. Steenblik, former Senior Trade Policy Analyst, OECD, 20 July 2018.
[24] Interview with senior official, Ministry of Foreign Affairs and Trade, Government of New Zealand, 9 August 2018.
[25] Interview with R. Steenblik, former Senior Trade Policy Analyst, OECD, 20 July 2018.
[26] Interview with senior official, Ministry of Foreign Affairs and Trade, Government of New Zealand, 9 August 2018.

Moreover, the involvement of multiple forums allows advocates of FFSR to point to developments in other institutions to enhance ambition in their own forum, lest it falls behind.[27] One example of such positive reinforcement is the peer-review mechanisms established under both the G20 and APEC, described in more detail in Chapter 5. Nevertheless, it should be noted that such dynamics also create potential for upholding the lowest common denominator. This may constitute one explanation for why otherwise more ambitious groupings such as the Friends have opted not to set a timeline for FFSR (see Chapter 5). Finally, institutional complexity also offers the opportunity to widen the geographic scope of FFSR efforts. For instance, the fact that peer reviews are conducted under both the G20 and APEC has allowed economies from both groups to become engaged. Likewise, engagement under the High-level Political Forum on Sustainable Development (HLPF) has provided opportunities to increase traction for reform among various African countries.[28]

Despite such benefits, there are also certain challenges associated with the institutional complexity in this area. First, and like in the case of renewables, it heightens the risk of duplication of work. Although the peer reviews undertaken under the G20 and APEC can largely be seen as synergistic (Chapter 5), both forums have had to identify guidelines and approaches for review, which means that the process may have not been as efficient as it would have been under one single institution. Another, perhaps more consequential, example is the subsidy estimation work conducted by the various international organizations that produce estimates of fossil fuel subsidies, namely the IEA, IMF, OECD, and, in the future (as custodians of SDG Indicator 12.c.1), UNEP. For instance, although the IMF reports estimates for more countries than the IEA does, both organizations take a similar approach to subsidy estimates that take consumer price support as a starting point. Better coordination among the various institutions involved could help minimize the risk that labour-intensive efforts are unnecessarily repeated and, indeed, prevent inconsistencies in definitions and data from being used as an excuse to postpone action (see OECD 2018b, 10).

A second potentially problematic consequence of institutional diversity in this area has been competition among standards for defining a subsidy. At US $5.3 trillion a year, the IMF's 'post-tax' estimates of fossil fuel subsidies put such support in another order of magnitude compared to OECD and IEA estimates (Coady et al. 2017; Chapter 5).

The ambiguity has been a contributing factor for countries to claim they do not have any fossil fuel subsidies at all (e.g. South Africa, Burton et al. 2018). At the same time, such contestation of what constitutes a subsidy may have certain

[27] Ibid.
[28] Ibid.

advantages: it may enable countries to engage in reform at a pace suitable to their national circumstances;[29] and different definitions and valuation approaches can highlight complementary information about subsidies, such as, in the case of the IMF definition, their broader societal cost. The extent to which definitions diverge should also not be overstated since there are several areas of measurement on which international organizations are in agreement (Koplow 2018).

8.4.3 Management Options

These findings suggest that there are a few areas in which improved management between different institutions could enhance the effectiveness of international FFSR governance. In terms of duplication of work, while there may be an ownership rationale for the G20 and APEC to take their own approaches to VPRs, better coordination between the intergovernmental organizations involved in monitoring fossil fuel subsidies, such as the IEA, IMF, OECD, UNEP, and the World Bank, may allow both institutions to generate their data more efficiently, and indeed, is something that their members 'could be demanding'.[30] One challenge in this regard, however, is that the IEA depends on data sales for much of its revenue.

Whether international FFSR governance would benefit from enhanced coordination around the definition of a fossil fuel subsidy remains an open question. The first internationally agreed-upon methodology for the measurement of fossil fuel subsidies, issued in the context of monitoring progress on SDG indicator 12.c.1. on fossil fuel subsidies, marks an important step in this regard (UNEP et al. 2019). If efforts to elevate FFSR to the World Trade Organization (WTO) space prove successful (Verkuijl et al. 2019), the WTO's overarching definition for subsidies may also gain more traction in this context. Nevertheless, given that fossil fuel subsidies' definitional ambiguity may also be associated with certain advantages, it will be important to ensure that such a universal definition neither sets too high a threshold for action – creating a risk that some countries may disengage – nor too low a bar, which would see certain policies be needlessly excluded from FFSR discussions. Going forward, it will be important for advocates of reform to get this balance right.

8.5 Assessments of Effectiveness for the Carbon Pricing Subfield

8.5.1 Assessment of Outputs, Outcomes, and Impacts

Placing a (substantial) price on carbon emissions constitutes a key component in the response to climate change and is, according to some scholars, the most or even

[29] Ibid.
[30] Interview with R. Steenblik, former Senior Trade Policy Analyst, OECD, 20 July 2018.

the only effective instrument for mitigating climate change (Nordhaus 2008; Rabe 2018). As discussed in Chapter 6, a range of public, private, and hybrid institutions promoting carbon pricing internationally have emerged over the last twenty-five years. Due to the partial overlaps in terms of governance functions and the interlinkages between these institutions, it is difficult to pinpoint the effectiveness of the individual institutions. Yet, it is possible to discuss their combined output, outcome, and impact effectiveness.

First, outputs have been substantial and increasing exponentially over time. Companies that join private institutions – such as the UN Global Compact, Caring for Climate, or the Carbon Neutral Protocol – thereby commit to adopt mitigation strategies, including internal carbon pricing or ensuring carbon neutrality inter alia via offsetting. Joining the Carbon Pricing Leadership Coalition (CPLC), for instance, entails a commitment to support carbon pricing, although not necessarily to adopt it. When it comes to aviation, the Carbon Offset and Reduction Scheme for International Aviation (CORSIA) will in the future constitute a mandatory instrument for pricing emissions placed on the individual airlines. Regarding more technical output, most of the institutions in the subfield have been active in producing reports and other information that raised awareness and increased knowledge of carbon pricing. They also established standards for offsets and for carbon-market units. The subfield is less effective, however, when it comes to operational activities such as research and development as well as financing. Here, only the Partnership for Market Readiness provides rather modest amounts for capacity-building.

Second, concerning outcome, there has been significant behavioural change in terms of carbon-pricing policies. By early 2018, sixty-six such policies had been adopted globally by public actors (states as well as supra- and sub-national polities such as the EU or American states), and an additional fifty-two carbon pricing policies were being actively considered (Skovgaard et al. 2018).[31] The policies were put into place in all regions of the world, with a notable spike from 2015 and onwards, coinciding with the emergence of many of the institutions. While these figures do not include carbon pricing by companies on aviation, the 2016 adoption of CORSIA as a future mandatory pricing scheme in this sector fits the trend.

Yet, it is difficult to assess to what degree the output of the institutions has affected behaviour change among the actors targeted by that output (e.g. states, companies). The decision to adopt carbon pricing is inherently a polity- or business-level decision. With their standards and commitments, the governance functions of the institutions may incentivize the adoption of carbon pricing, but they may well lack the leverage to drastically alter polity- and business-level

[31] These figures do not include carbon pricing adopted by private actors.

decisions (e.g. sanctions or shaming of norm violation). From the mid-1990s to the early 2010s, private institutions, particularly IETA, have been important in promoting carbon markets, particularly in industrialized countries (Meckling 2011; Paterson 2012; Paterson et al. 2014). More recently, the Partnership for Market Readiness, as well as other institutions embedded in the World Bank and the United Nations Framework Convention on Climate Change (UNFCCC) Secretariat, have provided expert assistance to several of the developing countries that had adopted or were considering carbon pricing within the last ten years. They also facilitated learning processes among such countries.[32] It is thus plausible that this assistance has increased the likelihood of carbon-pricing proposals being adopted, but this is ultimately a subject for future research.

Third, the assessment of impact proves even more difficult. As an approximation, we briefly focus on the impact of the carbon-pricing policies that have already been implemented, while bracketing the question to which degree they have been driven by certain intergovernmental or transnational institutions. The impact effectiveness of the public carbon pricing policies can be measured in three ways. The first is to appraise the share of global emissions covered. The World Bank and Ecofys (2018) estimated that public carbon-pricing policies implemented by 2018 cover about 15 per cent of global emissions, rising to 20 per cent once the Chinese emission trading system (ETS) (scheduled for 2020) is operational. This is below the CPLC's goal of 25 per cent of global emissions by 2020, but still a sizeable share and a drastic increase compared to about 8 per cent by 2012 and less than 1 per cent by 2004 (World Bank and Ecofys 2018).

A second indicator, and arguably a more important one than the share of global emissions covered, is the incentive for reducing emissions that carbon pricing actually provides. This incentive can be measured in terms of the price of emitting one metric tonne of CO_2-equivalents. Mainstream climate economists argue that getting the price right is the chief objective of carbon pricing (Tol 2011). The price is right if it corresponds to the costs to society of emitting one tonne of CO_2 equivalents, meaning that the externality has been fully internalized. To which degree emitters actually choose to cut emissions is less important in this thinking – a notion that might be at odds with the goal to keep temperature increases to 1.5 or 2 degrees (UNFCCC 2015). Yet, no matter whether the objective is internalizing the externality of climate change or limiting temperature increases, current carbon prices are too low. According to the World Bank and Ecofys (2018), 46 per cent of the emissions subject to carbon pricing are valued below 10 US $/tonne, and most of the emissions above 10 US $/tonne are priced between 10 and 20 US $/tonne. As a reality check, the report by the High-Level Commission on Carbon Pricing

[32] Interview with senior official from the Partnership for Market Readiness, 27 August 2018.

(2017) found that price levels should be between 40 and 80 US $/tonne in 2020 to meet at least the 2 degrees target. Likewise, a meta-study of various economic estimates about the social costs of carbon found that the actual average price should be 80 US $/tonne (Tol 2011).

Third, it is difficult to isolate the impact of carbon-pricing policies, since emissions are influenced by various additional factors – including fuel prices, technology development, economic growth, and other emissions-reducing policies (e.g. fossil fuel subsidy reform or policies supporting renewable energies). These difficulties notwithstanding, existing studies of individual carbon-pricing policies indicate that their impact is limited. Carbon taxes have had at least some success in reducing emissions – as they generally have higher price levels than carbon markets and mainly have been adopted by smaller, European countries (Rabe 2018, 9). The impact of carbon markets, however, is more modest. On the upside, the sectors covered by the EU ETS, by far the world's largest carbon market, have experienced falling emissions since its inauguration in 2005. However, this drop in emissions is predominantly attributed to the economic crisis and renewable energy and energy-efficiency policies, with the ETS playing a smaller role (Hu et al. 2015; Bosello et al. 2016). Likewise, the Californian ETS, which is also among the largest carbon-pricing schemes in the world, has played a limited role in curbing emissions compared to other policy instruments such as renewable-energy policies (Bang et al. 2017).

8.5.2 Consequences of Institutional Complexity: What Are the Implications for Carbon Pricing?[33]

The carbon-pricing subfield is characterized by a number of institutions (13) that fall somewhere between the figures for the renewable energy and fossil fuel subsidy reform subfields. The same way that it was much easier to assess the output than the outcome and especially the impact or environmental effectiveness of carbon pricing, it is also easier to do so for the consequences of institutional complexity. We therefore concentrate on output and outcome in this subsection.

Regarding potential positive effects, institutional complexity has improved output in terms of simply increasing knowledge-sharing in terms of technical reports, workshops, and other dissemination formats. Concerning outcome, our informants highlight that the sheer number of institutions promoting carbon pricing should have a positive impact to keep it on the political agenda. Furthermore, the

[33] This section and the following are based on insights from interviews with officials from the UNFCCC Secretariat, the Carbon Pricing Leadership Coalition, the Networked Carbon Markets, and the Partnership for Market Readiness; as well as to a lesser degree from other carbon pricing institutions. The interviews were carried out May 2017–August 2018.

diversity of institutions, especially in terms of their memberships, helps to reach a wide variety of actors (business, policy-makers, civil society) from different sectors, e.g. with CORSIA and IATA_COP specifically targeting aviation emissions.

As for possible negative effects, the output of the various institutions is not necessarily coherent. As discussed in Chapter 6, the institutions' interpretation of the core norm of carbon pricing may diverge, with different objectives emphasized (e.g. whether the objective is functioning carbon markets or pricing emissions through carbon markets or taxes), and several informants therefore highlighted the risk of incongruent or even conflicting messages. At the same time, the interviewees also stressed that (especially cognitive) interlinkages between the institutions, as well as deliberate management efforts, help to reduce such incoherence. The risk of conflicting messages also pertains to outcome effectiveness. One example is the various institutions that promote particular standards for linking carbon markets, either under Article 6 of the Paris Agreement or for voluntary offsets. Having several standards may result in them undermining each other and incentivizing forum shopping by members. Incongruent messages also characterize the overall choice between carbon markets and taxes, since some institutions only promote carbon markets, whereas others promote both carbon markets and carbon taxes. Finally, different audiences – be they governmental, business, or civil society actors – may be less convinced if they are presented with differing arguments about the merits of carbon pricing, which may undermine the legitimacy of the instrument.

Altogether, it is difficult to gauge whether the positive consequences (larger volume of output, outreach to a diversity of audiences) outweigh the negative ones (incoherent messages and standards). This notwithstanding, and as we discuss in the following subsection, management efforts should target the negative consequences rather than reinforcing the positive ones. The positive consequences are mainly a direct consequence of the number and composition of the institutions and exist independently of management efforts.

8.5.3 Management Options

Given the current moderate levels of (mainly informal) management of the carbon-pricing subfield, it is perhaps not surprising that informants thought that more management efforts would increase effectiveness without being a game-changer. As an option, they particularly pointed to increased coordination between the existing institutions, rather than orchestration by a particular institution. Such coordination could mainly imply scaling up existing coordination efforts, while promoting a common narrative around a shared understanding of key tenets. Such tenets may include, for instance, that there is no one-size-fits-all approach but that

the promotion of carbon pricing needs to be adjusted to local circumstances. With such a form of coordination, the aforementioned contradiction or incongruence of messages could be limited, as could incoherent standards for linking carbon markets or voluntary offsets.[34]

Beyond incoherence, existing informal divisions of labour, e.g. between the Partnership for Market Readiness (PMR) and the UNFCCC Secretariat (see Chapter 6), could be supplemented by a more overarching division of labour – one that also covers areas where such coordinating arrangements do not currently exist. Such arrangements are relevant for determining which institutions should target which actors, not only among specific business sectors or groups of countries but also among different ministries and agencies within the same government.[35] A respective division of labour could also take into account actors that may be currently overlooked, since institutions may easily cluster around the same actors when seeking them out independently of each other.

Our interviewees were not in agreement regarding whether coordination should cover all institutions within the subfield or just some, e.g. the UNFCCC and the World Bank–embedded institutions (CPLC, PMR, and Networked Carbon Markets, see Chapter 6). Altogether, they indicated that more coordination could improve effectiveness, mainly in terms of outcome, i.e. behavioural change, since output was already relatively high and would not be significantly affected by coordination. This said, increased coordination would not necessarily improve outcome effectiveness radically, since incoherence is not a major impediment to such effectiveness and is already addressed through existing coordination to some degree.

8.6 Conclusions

This chapter has evaluated the extent to which, and the ways in which, three subfields of the climate-energy nexus – renewables, fossil fuel subsidy reform, and carbon pricing – can be viewed as effective. The study has advanced a nuanced picture of how institutional complexity affects effectiveness, as well as presenting a set of management options for each subfield to enhance effectiveness. In what follows we compare some of the similarities and differences among the results from each subfield and discuss what our findings mean for the performance of the climate-energy nexus as a whole.

The chapter yields three broad insights. First, all three subfields appear to be successful in producing outputs, especially in terms of information-sharing and

[34] Interview with senior official from the UNFCCC Secretariat, 20 September 2018.
[35] Interview with senior official from the Partnership for Market Readiness, 27 August 2018.

capacity-building. While such outputs may seem trivial at first sight, it is important to note that institutional arrangements in other fields of global environmental governance have failed to produce significant results even at this first level of effectiveness – such as the more than 300 multi-stakeholder partnerships for sustainable development launched at the World Summit for Sustainable Development in Johannesburg 2002 (Pattberg et al. 2012).

At the outcome level, performance is more difficult to assess due to practical reasons of data-gathering and establishing causal relationships and, where this is possible, the success levels seem somewhat weaker. Results show that the institutions across the three subfields have likely influenced behavioural changes amongst actors, for example, through promoting learning processes and policy reform. However, these outcomes have not been as far-reaching as to successfully alleviate the collective action problems that are underlying the respective subfields.

On the whole, therefore, we find little concrete evidence of the institutional complexes across the subfields significantly contributing to problem solving in terms of scaling up renewables, stringent carbon pricing, and alleviation of fossil fuel subsidies. Having said that, it is unclear whether lack of outcome and impact level effectiveness is simply due to data-gathering and analytical challenges.

Second, institutional complexity can both help and hinder effectiveness. The existence of multiple institutions within a field may result in duplication of efforts and counterproductive competition, but can also create positive feedback loops and productive competition. As seen in the example of carbon pricing, even the mere fact of having many institutions working on one issue promotes political attention. In the area of fossil fuel subsidy reform, the engagement of multiple institutions has created new opportunities for FFSR advocates to keep the issue on the international agenda by framing the need for reform in different ways. A similar effect is noted in the subfield of renewable energy, which has witnessed a proliferation of actors, in particular nonstate and sub-national ones, that participate in various institutions and voluntarily create and abide to new rules and norms. To summarize these observations, the sheer magnitude of new actors and institutions that constitute the climate-energy nexus enhances political attention.

Moreover, institutional complexity may facilitate experimentation and learning at multiple venues, jurisdictions, and scales and allows for targeting actors that significantly differ in their preferences and opportunities and constraints they face, e.g. in countries with varying levels of economic and social development. This flexibility, on the other hand, risks leading to conflictive norms, forum-shopping, and diluted ambition levels. Altogether, this ambivalence is in line with previous literature on institutional complexity and fragmentation that highlights both advantages and disadvantages of such complexity (Keohane and Victor 2011; Zelli and van Asselt 2015).

Third, to the degree that international institutions can influence actors, a coordinated approach is arguably the most important factor in improving effectiveness. This should particularly imply the promotion of a common narrative and establishment of a division of labour between institutions, rather than adding further orchestration efforts for example. This said, such coordination attempts are currently largely lacking across all three subfields – which points to a major challenge: institutional complexity often arises due to a divergence of priorities amongst powerful actors (Keohane and Victor 2011), and this very conflict of interests may also hamper any coordination efforts.

In sum, institutions working within the climate-energy nexus face difficult challenges to address. On the one hand, these institutions are strengthened by having other institutions to collaborate with to reinforce their work. On the other hand, competition over resources, as well as duplications, contradictions, and incongruence of the work of different institutions, undermine some of these benefits.

The renewable energy subfield illustrates this ambiguity. On the one hand, internationally set goals provide a joint vision across institutions. On the other hand, the coordination between the multitude of institutions is far from sufficient. Further research is thus needed to look into how such coordination could be achieved to improve the effectiveness of the climate-energy nexus. Such research should look beyond the meso level and also examine interactions across subfields.

What this analysis has shown is that institutions within the three selected subfields have laid much of the groundwork for effectively contributing to their respective subfields. What is required now is the closing of governance gaps, crucially in finance and implementation, and greater cooperation between institutions to overcome some of the downsides of institutional complexity.

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