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Conceptualizing Regime Complex Effectiveness

> Some regimes matter in the sense that they make a (sometimes sizable) difference not only in terms of outputs and outcomes but also in terms of solving the problems that lead to their creation.
> –*Oran Young,* Effectiveness of International Environmental Regimes

The Intergovernmental Panel on Climate Change (IPCC) has stressed the urgent need for a rapid transition to net zero as the window narrows to abate carbon emissions before we pass global warming tipping points (IPCC 2023). To achieve global net zero by 2050, between USD 2 trillion and USD 9 trillion in annual investments is needed in renewables, infrastructure, and energy transition technologies (McKinsey 2022; Wood Mackenzie 2023). Emerging markets and developing economies play a critical role in achieving global net zero ambitions, owing to their economic and population growth forecasts and rising energy demands. The EMDEs have an opportunity to "leapfrog" and adopt increasingly affordable clean energy technologies, capturing the significant benefits associated with clean energy technologies along a greener industrialization pathway, such as reducing air pollution, improving energy access and sanitation, and reducing waste (McKinsey 2023). Energy transitions in EMDEs will require climate finance and development to reduce additional risks for private climate investments, as well as to increase technology transfer and reforms of international investment agreements to support the global transition away from fossil fuels (Dechezleprêtre et al. 2012; UNCTAD 2023a, 2023b). How can we understand the complex international institutional landscape that is facilitating the global transition, and the array of capital, resources, and diffusing norms that will impact energy transitions in EMDEs? This chapter considers how complex global governance influences energy transitions at the domestic level in EMDEs.

The sphere of governance surrounding the global energy transition and clean energy issue area is characterized by proliferating and overlapping international

institutions and fragmented, complex governance, which I conceptualize as the clean energy regime complex. Regime complexes can be defined as an arrangement of partially overlapping, semi-hierarchical institutions, rules, and norms governing a particular issue area (Alter and Meunier 2009; Alter and Raustiala 2018; Raustiala and Victor 2004). The regime complex concept helps us capture dynamics of interactions between regimes and dynamics of overlapping and interacting institutions and networks within a sphere of complex governance. However, the regime complex concept must further expand in scope, both horizontally to incorporate a variety of actors and vertically to capture its impacts on domestic politics.

A regime complex is a complex system because it encompasses many actors and organizations and is characterized by institutional interactions and decentralized decision-making (Harrison 2006; see also Gehring and Faude 2013; Orsini et al. 2013). The interactions, feedback loops, and overlaps are some of the evident systemic effects of a regime complex that create interdependencies (Hollway 2021). The relative hierarchy and differentiation among institutions within a regime complex architecture can affect the patterns of cooperation in an issue area (Aggarwal 1998; Green 2022; Henning and Pratt 2023). Often differentiation and hierarchies are driven by the relative power of their member states, which then affects how overlapping international organizations resolve jurisdictional conflicts through institutional deference (Pratt 2018).

Investigating the effectiveness of regime complexes, particularly in the realm of clean energy and energy transitions, fundamentally relies on the interaction between the regime complex and domestic politics. The clean energy regime complex involves state actors, multilateral organizations such as multilateral development banks or intergovernmental organizations, and bilateral organizations, bilateral investment treaties, bilateral development agencies, and transnational actors and networks. While state actors and multilateral organizations are the necessary foundation for an international regime, the inclusion of bilateral organizations and transnational network arrangements distinguishes a regime complex structure. Keohane and Victor (2011) incorporate aspects of bilateral agreements and initiatives in their definition of a regime complex, as do other scholars working on club governance (see also Helfer 2009; Lesage et al. 2010; Nordhaus 2015). The incorporation of bilateral development initiatives is a critical element of the clean energy regime complex, as they play a central role in implementation. The transnational aspects of regime complexes include the cross-border activities of non-state actors, advocacy networks, international organizations, NGOs, and subunits of states and their horizontal government networks or vertical networks with supranational organizations acting across state borders (Andonova et al. 2009; Bulkeley et al. 2014; Hale and Roger 2014; Keohane and Nye 1989; Nye 1990; Slaughter 2004). Public non-state actors may include transnational actors of

subnational governments and municipalities, or civil society organizations and grassroots community networks. Private, transnational initiatives comprise multinational corporations, industry lobbies, NGOs, foundations, and transnational private networks like banks. Public-private partnerships also play an important part in regime complex dynamics. The inclusion of a wide range of actors in the conceptualization of the clean energy regime complex is important for capturing deeper insights into the different scales of governance, the diverse interactions of these actors, and pathways through which this inclusivity can lead to increased effectiveness.

The existing regime complex literature is limited in its exploration of regime complex effectiveness, as well as the interaction between the international institutional landscape with domestic politics in EMDEs. The clean energy regime complex can be viewed from a sphere of governance at the international and transnational levels, but it interacts with state and substate actors in EMDEs to foster energy transitions, poverty reduction, and sustainable development. This book theorizes the regime complex's impacts at the domestic level through a problem-solving approach. The regime complex as originally formulated by Raustiala and Victor (2004) focuses specifically on multilateral actors involved in international policymaking. Scholars have since integrated transnational actors and private networks into the regime complex conceptualization (Abbott 2012; Chelminski et al. 2022; Green 2022; Green and Auld 2017), while others incorporated bilateral actors as well (Alter and Meunier 2009; Bernstein and Cashore 2012; Kahler 2016; Keohane and Victor 2011). This book adopts the conceptualization which includes multilateral and bilateral organizations, and transnational actors into the definition of the regime complex. These actors have a fundamental role in formulating international policy, financing clean energy and implementing policy diffusion, social learning and capacity building on the ground in EMDEs, and are therefore integral actors to include in the regime complex. The regime complex architecture for clean energy at the international level is fragmented and represented by proliferating and overlapping organizations. There is functional differentiation among organizations in the clean energy regime complex, wherein some organizations are focused on knowledge production, international policymaking and convening international forums, while others concentrate on implementing pilot projects, financing, and technical assistance on the ground in EMDEs. The hierarchy among the organization active in the clean energy regime complex is limited, albeit Chelminski et al. (2022) find that some organizations have greater legitimating power compared to others. The governance landscape is also heterogeneous across countries and sectors in terms of which organizations are active where: the organizations/institutions active in

recipient countries differ from country to country and across sectors, which may create asymmetries in access to finance across EMDEs.

This chapter develops a theoretical framework for analyzing the effectiveness and impact of the clean energy regime complex. The theoretical framework explores a tension between the agency and interests of a variety of actors against the constraints of the complex and a dense institutional landscape. If the space of analysis is reduced to the regime complex system, it is possible to examine how this complex system affects the interests and behaviors of actors within it, and those impacted directly and indirectly by it.

Complex Governance Effectiveness

To conceptualize effectiveness, this book draws from the regime literature, which outlines four approaches to measuring regime effectiveness: problem-solving, behavioral, process and capacity, and transformational approaches (Haas 1989; Victor et al. 1998; Young 1992, 1996; Young and Levy 1999). In the *problem-solving approach*, regime effectiveness is measured by the extent to which a regime or treaty addresses the governance problem it was designed to solve. Under the *behavioral approach*, the regime directly causes behavior to change. The *process and capacity approach* measures effectiveness by the extent to which states comply with the rules or enforce them within domestic legal contexts. The *transformational approach* measures how well a regime can empower experts to change state interests or practices. This book adopts a *problem-solving* or *process approach* to measure the effectiveness of complex governance in solving the governance problem around which institutions are designed, with a focus on domestic-level impacts. The problem-solving and process approaches to measuring effectiveness are also necessary to understand how the regime complex has changed behavior and interests of involved actors, as well as the performance of policies and institutions that contribute to the effective management of a problem.

Effectiveness and the impact of a clean energy regime complex on energy transitions can be operationalized through different effects. One effect can be represented through different phases of policy activity: agenda setting, international policy formation, and national policy development (Keohane et al. 1993). Agenda setting and international policy formation help create facilitating conditions for national-level policy responses. While there is an assumption that national regulations will lead to change in the behavior of the actors necessary to improve an environmental problem or externality, this causal pathway needs to be demonstrated through observable data on change in environmental effects in order to show that the international institutions have made a tangible impact on the environmental problem. Thus other effects are indicative of impact as well, such as domestic

policymakers changing approaches to problem solving, reducing domestic policymakers' perceptions of risks with particular policy or energy security approaches, increasing investment (domestic or foreign) in the renewables sector or transition away from fossil fuels, or institutional changes to the domestic government to increase capacity for renewable energy policy and programs.

Much of the literature on effectiveness in international relations and environmental governance is devoted to evaluating the effectiveness of integrated regimes. In contrast, establishing the effectiveness of less-integrated regimes or fragmented governance such as regime complexes is challenging since the aims of the regime complex are rarely integrated and have only voluntary rules and procedures, if they exist at all. While studies of regime complex effectiveness are limited, a few scholars have put forth frameworks and indicators to measure effectiveness or influence (Bernstein and Cashore 2012; Carbonnier et al. 2011; Kalfagianni and Pattberg 2011; Keohane and Victor 2011; Young 2011; Young and Levy 1999). It is necessary to understand the effectiveness of regime complexes not only because they increasingly characterize many of the governance solutions offered in recent years (e.g. health, forestry, extractives, finance, marine biodiversity), but also to know where they succeed and fail in comparison with the traditional international regime. International regimes are outlined by much of the environmental governance and regime literature as a necessary condition or solution to global public goods problems, so the study of regime complex effectiveness provides an alternate possibility, particularly in our increasingly complex world.

To create an initial framework for analyzing the different effects of a regime complex and the overall effectiveness of this governance arrangement, I adapt Young and Levy's (1999) typology of pathways through which regimes affect outcomes of regime complexes and Carbonnier et al.'s (2011) interpretation of this framework for non-binding agreements, as it provides insights to the many ways a regime complex can influence state behavior and national policy and realign domestic coalitions.[1] Other works on regime effectiveness, such as Mitchell (1994) and Downs et al. (1996), only focus on the overall effectiveness as measured by one outcome variable: compliance. Haas et al. (1993: 11) provide a more dynamic definition of effectiveness by looking at high levels of government concern for an issue, hospitable contractual environment, and sufficient capacity for implementation. However, their definition of effectiveness is not quite applicable to measuring the effectiveness of the various voluntary and non-binding agreements that make up parts of a regime complex. Green and Auld (2017) outline how integrating private

[1] Carbonnier et al. (2011) applied Young and Levy's (1999) framework to voluntary regimes as well to measure effectiveness, which they found useful. I will also look at the application of this framework as a reference point.

authority can enhance the "problem-solving" ability of regime complexes through four mechanisms: incubation, reformulation, diffusion, and incorporation by reference. Young (2011) as well as Breitmeier et al. (2006) outline additional functionality of regimes in knowledge production, namely through programmatic activities that help raise awareness of issues and could further catalyze normative change. Young and Levy's (1999) use of multiple mechanisms allows one to envision dynamic effects leveraged by a complex system. Carbonnier et al.'s (2011) reinterpretation provides an additional lens of analysis to interpret the effectiveness of non-binding agreements. I adapt these various models to focus on ways that a regime complex can impact actor behavior and problem-solving capacity through dynamic effects such as modifying utility, facilitating learning, and building capacity (see Figure 2.1).

As Young and Levy (1999) pointed out, successful regimes can activate several mechanisms simultaneously to produce behavioral effects, which is aligned with the types of mechanisms and effects we are likely to see with regime complexes. The looser, voluntary governance arrangements can elicit cooperative behavior on an issue, subsequently improving a problem. These arrangements are typically more flexible and less prone to concern for the costs of non-compliance, and therefore can allow actors to adopt ambitious targets and far-ranging commitments. The non-binding commitments start a process of cooperation and commitment to solving a problem that can later be ramped up or combined with civil society monitoring and advocacy (Carbonnier et al. 2011). Depending on the problem, non-binding agreements or informal law can be as effective as legally binding treaties in solving a problem (Pauwelyn et al. 2012b). In the case of a regime complex, non-binding commitments can combine with overlapping institutions and networks, leading to enhanced cooperation and commitments in an issue area. These overlapping institutions can also lead to increased transaction costs. Conceptualizing regime complex mechanisms as having dynamic effects is helpful to understand how the clean energy regime complex can be effective in catalyzing change around energy transitions at the domestic level in EMDEs.

Bernstein and Cashore (2012) outline ways that complex governance can influence domestic policy-making processes through four pathways, and "direct access" most closely aligns with the three mechanisms of effectiveness that I outline. They elaborate that influence through domestic access to domestic policy-making processes "occur[s] through direct funding, education, training, assistance and capacity-building, and possibly even through attempts at co-governance via partnerships between domestic and international public and private actors and authorities" (Bernstein and Cashore 2012: 593). Table 2.1, adapted from Young and Levy (1999) and Carbonnier et al. (2011), presents the positive and negative indicators of

Table 2.1 *Mechanisms of regime complex effectiveness*

Type of effects	Utility modifier	Social learning	Capacity building
Regime complex positive effects	Participation in a regime complex may provide access to finance and capital markets, increasing incentives for cooperation.	Provision of new facts creates a more accurate picture of the problem, which can lead to a new perspective on solving a problem, alternative measures for problem-solving, and implementation.	Provides training and education to build human capital and technical expertise through workshops, training programs, and international forums.
Regime complex negative effects	Voluntary agreements and lack of centralization can lead to asymmetric access to markets and finance.	Presence of multiple epistemic communities or experts may promote different discourses, leading to diverging behavior.	Uncoordinated efforts may mean gaps in training and education of key domestic actors.

Source: Adapted from Carbonnier et al. 2011; Young and Levy 1999; also see Bernstein and Cashore 2012

effectiveness in a regime complex.[2] This table is used to evaluate the effectiveness of the regime complex in addressing clean energy technology development and energy transitions in Indonesia and the Philippines. Building on these authors, I operationalize the "mechanisms of effectiveness" of a regime complex as the dynamic effects (and independent variables), including utility modifier, social learning, and capacity-building mechanisms. I conceptualize the effectiveness of a regime complex through an examination and operationalization of its mechanisms. Since the effectiveness of the regime complex is defined as the regime complex's ability to achieve its goals or address the problems it was created to solve, the dependent variable in the analysis of the clean energy regime complex is the energy transition in EMDEs, which is demonstrated through material changes in barriers to technology deployment and regulatory change (adoption and/or reform), as well as through the growth in installed renewable energy generation capacity. The mechanisms of effectiveness are traced to identify their impact on the barriers to renewable energy technology development and on subsequent growth in installed capacity.

A regime complex has the potential to influence international cooperation and domestic political interests in several ways. As shown in Figure 2.1, the effects on

[2] Capacity building was replaced by Young and Levy's concept of "realignment," and so capacity building was not in their original framework.

both domestic politics and international cooperation (vertical and horizontal interplay) often occur simultaneously. It is possible to isolate individual effects, but this does not capture the full picture of interaction effects among different levels of governance.

A regime complex can have direct or indirect effects, whereby the mechanisms of a regime complex can directly influence outcomes or generate indirect effects that eventually lead to behavior change when combined with multiple mechanisms. The longer the causal chain between regime complex mechanisms and outcomes, the more indirect the effect. As regime complexes are characterized by many institutions and complexity, there are likely to be indirect effects on domestic actor behavior as these elements interact with each other, leading to different outcomes. For example, development banks promote different problem-solving approaches to remove a barrier to renewable energy technology deployment, such as addressing financial risks associated with early-stage geothermal exploration drilling over time through policy dialogues between the development banks and government ministries. The development banks may succeed in reframing and restructuring risks and expanding possible pathways to resolve barriers in domestic politics through promoting normative diffusion and social learning. Regime complexes can lead to positive and negative outcomes since the characteristic overlaps and interactions of institutions can lead to either redundancies or synergies that help or thwart the effectiveness of problem-solving.

The four mechanisms related to regime complex effectiveness are explored and conceptualized in what follows, including utility modifier, social learning, and capacity-building mechanisms. The interaction between the regime complex and domestic politics is conceptualized as well. These dynamics will be examined in the empirical chapters as they relate to the regime complex mechanisms for driving energy transitions in EMDEs.

Utility Modifier Mechanism

Turning to the mechanisms of influence in a regime complex, the clean energy regime complex can be effective when it changes actors' cost-benefit analysis as new rules or opportunities are introduced. As Young and Levy (1999: 22) note, "We can simply ask how specific rules and regime activities will influence the costs and benefits that established actors factor into their utilitarian calculus." Carbonnier et al. (2011) add that rules and regulations are not the only tools of effectiveness; market incentives are also effective. Through the utility modifier mechanism, the regime complex can modify the utility of domestic coalitions as well as of state actors on an international level. Market mechanisms are highly relevant and significant in incentivizing private investment in the clean energy sector (Aklin and Urpelainen 2018).

State participation in different institutions within a regime complex may provide access to finance and capital markets, which changes a state actor's calculation of costs and benefits. Through the utility modifier mechanism, the clean energy regime complex can help actors overcome the investment inefficiencies and market barriers to technology diffusion by providing access to finance, encouraging foreign direct investment in R&D, and improving information on market opportunities. Participation in institutions within a regime complex can also provide evaluations of opportunities to reduce costs or improve benefits if particular policies are put in place. For example, participation in the United Nations Environmental Programme's (UNEP) Green Economy Initiative provides countries with analysis and assessment of the sustainability, poverty reduction, and macroeconomic implications of investing in green sectors in their countries, which can change calculation of costs and benefits of shifting policies.

However, one negative effect of regime complexes is the potential for asymmetric access to markets and resources, as efforts and initiatives to solve a specific problem are voluntary and not coordinated through a central, intergovernmental body. This can lead to power and information asymmetries among countries that have unequal access, such as when certain countries are targeted as priorities for development aid over others; this is particularly evident in the realm of global health-related development aid asymmetries (Chorev 2020; Fergus 2022), but asymmetries are also evident in the realm of international development aid for clean energy as discussed in Chapter 3 (see Figure 3.5; IEA et al. 2022). These asymmetries can have a negative impact on cooperation and effectiveness of the regime complex if the actors that lack access to resources and information are the same actors at the root of the problem the regime complex is attempting to solve.

A regime complex's impact through the utility modifier mechanism is likely limited to short-term change without the complementary support provided through social learning and capacity-building mechanisms. The social learning and capacity-building mechanisms represent the major pathway through which a regime complex can address the technical capacity barriers to clean energy technology deployment, which is necessary to ensure long-term policy and behavior change, as detailed next.

Utility modifier mechanism: Through the *utility modifier mechanism*, the regime complex reduces the financial barriers to renewable energy development and improves access to financing, which complements other forms of financial support.

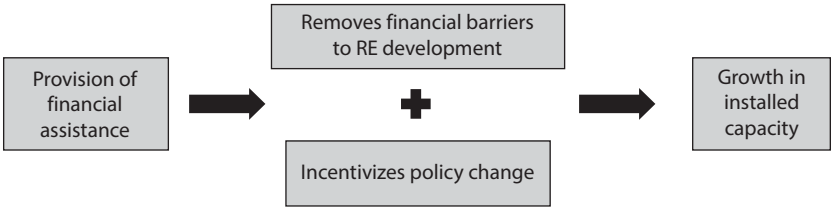

Figure 2.1 Regime complex utility modifier mechanism's impact on effectiveness.

Social Learning Mechanism

The regime complex can facilitate a change in behavior at the domestic level through the *social learning mechanism*, whereby new information and discourses are introduced at international forums and workshops and policy advice is offered by numerous multilateral and bilateral actors. Social learning can occur through the provision of information that produces a better picture of a problem, which can lead to a new perspective on solving a problem or alternative measures for problem-solving and implementation (Haas 1989; Young and Levy 1999). Social learning requires a change in beliefs concerning cause and effect, not merely the transfer and reproduction of existing policies (Dobbins et al. 2007; Elkins and Simmons 2005; Simmons et al. 2008). Social learning occurs when the cognitive changes that occur through the provision of new information by the regime complex results in change in policy approaches or objectives (Clark et al. 2001; Sabatier 1988).

Ideas and information can be injected by the regime complex into policy spheres and taken up through persuasion of a wider range of actors, stimulating public interest through outreach and media, or direct government interventions as policymakers search for policy alternatives to overcome political contestation (Heclo 1974).[3] The clean energy regime complex can influence social learning in EMDEs by disseminating information, convening international meetings to spread scientific knowledge, and developing monitoring and verification activities with domestic research constituents (Haas and McCabe 2001). As countries become engaged in the clean energy regime complex, there is an increased exposure to ideas and knowledge related to renewable energy technology development and the reinforcement of its connection with emissions reduction and climate mitigation. This participation can include state and non-state actors. In cases where governments are reluctant to change policy, non-state actors, such as civil society groups, can gain strategies for policy advocacy and mobilization through participation in various initiatives and forums hosted by the clean energy regime complex (Andonova and Tuta 2015).

[3] Also see Schimmelfennig and Sedelmeier (2005) for the example of norm diffusion via the "Europeanization" of Central and Eastern Europe.

Social learning manifests through policy changes made by government institutions and transferred across different ministries and levels of hierarchy, reflecting that the norms and policies that were originally promoted by international actors are taken up or adapted to fit the perspective of the government. The mechanism of social learning is demonstrated through policy dialogues between multilateral development banks, international organizations, or bilateral development aid meetings with relevant government ministries in EMDEs, or through high-level international meetings where norms are diffused, such as UNFCCC COPs or G20 Summits. Social learning is demonstrated through a change in the rules and regulations governing renewable energy resulting from learned information and problem-solving approaches to renewable energy development among international actors. For example, in Indonesia, as government officials learn of the negative externalities associated with fossil fuel subsidies such as the distortion of energy prices, the benefits of fuel subsidy reform become more apparent (Chelminski 2018). Social learning involves reframing issues and problems.

I expect that the clean energy regime complex can influence social learning in domestic politics through policy dialogues that disseminate information, reframe risks and problems by recommending alternative approaches to solving problems, and convening international meetings to spread scientific knowledge. The social learning and normative shifts in problem-solving or risk mitigation are likely to follow a longer-term timeline of impact as trust is built between government ministries and representatives from development banks or international organizations (see Figure 2.2).

Social learning mechanism: The regime complex diffuses norms of renewable energy development to policymakers at the national and subnational levels to support policy reform, and the social learning demonstrated through cognitive shifts helps address regulatory barriers to renewable energy development.

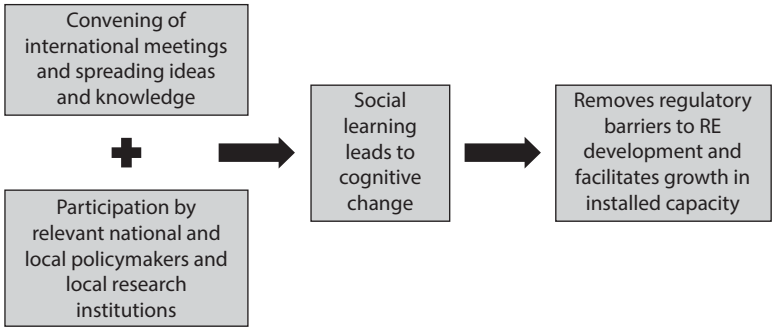

Figure 2.2 Regime complex social learning mechanism's impact on effectiveness.

Capacity-Building Mechanism

The *capacity-building mechanism* is the provision of resources directed to building human capacity through training and education. As Chayes and Chayes argue (1993), a lack of compliance with international agreements may result from a failure of institutional capacity on the part of governments to carry out the necessary steps for compliance, rather than willful non-compliance. This indicates that for states to comply with international agreements and implement their own national policy, there must be a certain level of institutional capacity or resources within government bureaucracy to undertake the endeavor. Similarly, Naqvi (2022) outlines that failure of governance of the power sector in Pakistan – as exemplary of EMDEs – is not due to lack of political will or a "weak" state but rather due to unevenness of capacity across various state- and local-level dynamics. To implement policy directives on renewable energy deployment, there must be an adequate technical workforce to design, engineer, construct, operate, and maintain renewable energy projects.

The capacity-building mechanism is therefore an important element of the regime complex, as workshops and trainings, technical capacity building, or technical assistance are a part of the resources offered by numerous international organizations and bilateral donors. The workshops and trainings provide the opportunity for international organizations to work directly with government representatives and stakeholders in EMDEs to build technical knowledge and provide relevant training such as calculating the additionality of renewable energy projects for the UNFCCC Clean Development Mechanism (CDM) accounting or workforce development. Through the capacity-building mechanism, the clean energy regime complex directly transmits knowledge through hands-on skills training or "learning by doing," such as joint monitoring and verification activities, whereas social learning can be more passive through policy dialogues and high-level international conferences that diffuse norms and reframe issues.

An important aspect of capacity building is the development of technical capacity, whereby international development assistance aims to build the technical skills of the labor force through scholarship programs or training. Another example is the Sustainable Energy for All Global Framework, which facilitates building the institutional capacity of local governments in EMDEs to collect data and local statistics on energy access, renewable energy, and energy efficiency, helping track progress toward goals in the Sustainable Energy for All Initiative.[4] While both institutional and technical capacity building focus on building human capacity to foster growth in renewable energy development, technical capacity is distinct,

[4] See www.se4all.org/tracking-progress.

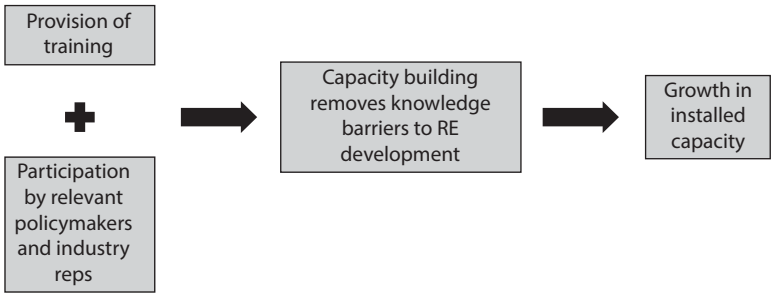

Figure 2.3 Regime complex's impact on effectiveness through the capacity-building mechanism.

particularly as it relates to renewable energy development, as developing energy resources requires high levels of technical skill. Without local technical capacity, EMDEs are dependent on the technical skills of international corporations or consultants and miss opportunities for creating jobs and technical expertise at the domestic and local levels. Therefore, the development of technical capacity is necessary to ensure long-term, self-reliant development of the energy sector.

The regime complex addresses technical capacity barriers to renewable energy development through the capacity-building mechanism, which is a necessary condition for ensuring effectiveness in the short and long term. Through the capacity-building mechanism, the regime complex can impact the institutional capacity of government ministries, technical knowledge of policymakers, and advance technical workforce development. For the clean energy regime complex to ensure effectiveness, relevant local and national level government officials and industry representatives must participate in training and capacity-building exercises (see Figure 2.3).

Capacity-building mechanism: The regime complex provides training and capacity building that support the development of technical and institutional capacity, reducing technical capacity barriers to renewable energy development.

Convergence of Domestic Political Interests

The impact of regime complexes on domestic politics is understudied in regime complex literature, even though the relationship between international and domestic politics is analyzed extensively in adjacent literatures such as comparative environmental politics (Hochstetler 2020; Sowers et al. 2023). International politics can impact domestic politics through trade and economic incentives, international coercion or conflict, and idea diffusion (Dobbins et al. 2007; Gourevitch 1978; Simmons et al. 2008). To fully grasp regime complex effectiveness, the interaction

between the international, domestic, and subnational cannot be ignored (Evans et al. 1993). A regime complex can unlock new market opportunities for actors, with the potential to change domestic interests. The incentives offered by the regime complex can restructure the domestic economy by undermining or appeasing special interest groups that oppose certain policy changes (Evans et al. 1993). The regime complex can thus offer new incentives and reframing of issues that facilitate a convergence of domestic interests in favor of a particular policy change or reform (Derthik and Quirk 1985). However, if domestic interests do not converge in the direction of policy change, then a regime complex is not likely to be effective in achieving goals of supporting policy change and removing barriers to renewable energy development. In this case, domestic politics plays an important role in mediating the impacts of a regime complex through lack of political will to implement policy changes or special interest groups that block momentum.

Another example of regime complex impact on domestic politics is through the creation of opportunities for subnational civil society and private actors to influence domestic politics through leveraging transnational networks and coalitions in favor of policy change. This can happen directly through the creation of public-private partnerships (Andonova 2014, 2017; Bulkeley et al. 2014; Green 2014; Green and Auld 2017) and sets off multi-stakeholder initiatives (Carbonnier et al. 2011). This can also happen indirectly through the work of transnational advocacy networks that raise civil society and international awareness of critical issues, leading to a boomerang effect changing state and industry behavior (Keck and Sikkink 1998). Alternatively, regime complexes provide subnational actors such as municipalities, NGOs, or civil society organizations opportunities to engage in transnational networks or international forums, which can expand engagement among subnational actors in a variety of different transnational governance initiatives in an issue area (Slaughter 2004). These networks, initiatives, and partnerships diffuse ideas that can eventually impact politics. The ideas channeled through institutions can be reflected in the incentives offered and the interest groups served by them (Goldstein and Keohane 1993). Nevertheless, domestic politics can also mitigate the effectiveness of transnational (Andonova et al. 2017) and international actors, such as the regime complex.

Regime complex effectiveness is mediated by the convergence or divergence of domestic political interests surrounding the ideas it channels. The incentives offered by a regime complex can be directed at special interest groups, but without broad-based domestic support for policy change and implementation there will be limited impact. In the case of the clean energy regime complex, the adoption of a policy removing barriers to renewable energy development is more likely when special interest groups are in favor of policy change and in support of renewable energy development. In contrast, divergent subnational political interests are expected to hinder regime complex effectiveness. If domestic political interests

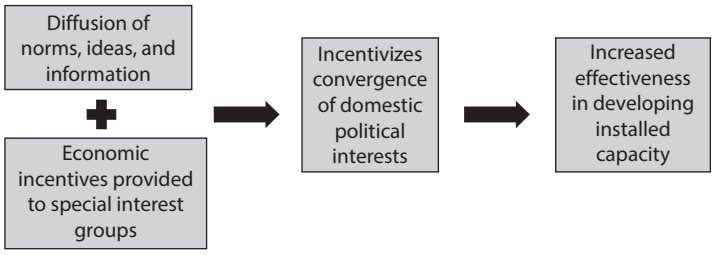

Figure 2.4 Regime Complex Impact on Domestic Political Interests Convergence.

for energy development are divergent – for example, split between conventional energy and renewable energy – the clean energy regime complex will be limited in incentivizing policy change and renewable energy development. If the regime complex is successful in incentivizing broad-based support across diverging special interest groups (Derthik and Quirk 1985), there is a greater chance for policy change and renewable energy development, representing effectiveness. The evolution of renewable energy development over time will signify the effectiveness of the clean energy regime complex (see Figure 2.4).

Convergence of domestic political interests: The regime complex incentivizes renewable energy development across diverging special interest groups to foster broad-based political support for policies or technology choices. The incentives or norms diffused by the regime complex may alleviate vested interests blocking or stalling renewable energy development.

Overcoming Technology and Policy Lock-In

As the regime complex interacts with domestic political interests and responds to external shocks, there are ways through which the mechanisms of the regime complex can overcome specific blocking factors. The main domestic blocking factors include policy or technology lock-in, interest and advocacy groups, and corruption or rent-seeking. *Policy and technology lock-in* occurs as technology and institutions co-evolve through path-dependent processes. The "lock-in" occurs when technological infrastructures and the organizations they create are mutually reinforcing, locking out other alternative technologies (North 1990; Unruh 2000, 2002). Once institutions are established, they tend to become locked in and only undergo incremental change over time due to path dependency. These institutions further reinforce technological infrastructures. *Special interest groups* and *advocacy coalitions* are subnational groups that share a set of norms or causal beliefs and work in concert to achieve certain political objectives, such as policy change (Sabatier 1988; Sabatier

		Domestic blocking factors		
		Policy and technology lock-in	Interest groups	Corruption/rent-seeking
Regime complex mechanisms	Social learning	Learning can promote alternatives policies or technology.	Policy advising can promote reforms that change benefits received by interest groups.	Institutional reform can help overcome rent-seeking and corruption.
	Utility modifier	Provides finance for alternative technology development despite lock-in.	Financial incentives for interest groups	Financial incentives for alternative payoff structure
	Capacity building	Capacity building for technical or institutional capacity for new policy or alternative technology deployment	Capacity building can provide advocacy strategies for interest groups.	Training to provide alternative income or workforce development

Source: Adapted from Chelminski 2022

Table 2.2 Regime complex's impact on domestic political interests convergence.

and Jenkins-Smith 1993). These groups can also favor the status quo and prefer to block particular policy changes. *Rent-seeking* is a form of corruption that involves pursuing preferential treatment by public decision makers, such as side payments, kickbacks, or competitive lobbying (Lambsdorff 2002). Corruption and rent-seeking can prevent policy change or block progress on alternative technologies. The regime complex can address the domestic blocking factors and technology and policy lock-in through the mechanisms of effectiveness, as illustrated in Table 2.2. The regime complex promotes alternative policies and technologies through policy advising (social learning mechanism), provides financial incentives to interest groups or to fund alternative technologies (utility modifier mechanism), and overcomes blocking factors by providing technical or institutional capacity for alternative technologies and strategies to advocacy groups (capacity-building mechanism).

To further develop the interaction between the regime complex's mechanisms of effectiveness and overall impact in overcoming domestic political interests, Figure 1.2 illustrates the interaction between the regime complex and domestic political

interests, and demonstrates the conditions under which the regime complex may be able to overcome lock-in.

As illustrated in Figure 1.2, the two opportunities for the clean energy regime complex to have an impact and overcome policy or technology lock-in are mitigated by levels of energy security and political will. As energy security decreases and political will to pursue alternative technologies and policies increases, there is the greatest opportunity for the regime complex to overcome lock-in through a mix of capacity-building and financial incentives. By contrast, the lowest possibility for the regime complex to overcome lock-in is when energy security levels are high and there is a lack of political will to pursue alternative technologies. In the other two corners of the matrix – strong energy security and political will for change on one side; high energy insecurity and lack of political will for change on the other – there is a potential opportunity for change. These opportunities depend on the mix of regime complex mechanisms that may overcome lock-in.

Conclusion on the Clean Energy Regime Complex Framework

To achieve global net zero ambitions, trillions of dollars in annual climate investments are urgently needed by 2050 to avoid global tipping points. Additional support is needed in EMDEs to de-risk private investment flows, build capacity, and diffuse international norms around the energy transition. The clean energy regime complex is a useful conceptualization to understand how the variety of international actors and organizations are working toward catalyzing energy transitions in EMDEs. However, it is critical that the regime complex concept expands horizontally – to incorporate many different multinational and bilateral development agencies, transnational actors, and international organizations in the clean energy issue area – as well as vertically – to explain how the regime complex influences domestic politics on the ground. I conceptualize the regime complex's impact on domestic politics through three mechanisms: utility modifier, social learning, and capacity building, which facilitate the necessary changes in norms, regulatory reforms, new approaches to problem-solving, or changing incentives to converge interests around an energy transition. Through the *utility modifier mechanism*, the regime complex reduces the financial barriers to renewable energy development and improves access to financing. The regime complex diffuses norms of renewable energy to policymakers at the national and subnational levels to support policy reform through the *social learning mechanism*. Social learning is demonstrated through cognitive shifts that help address regulatory or financial barriers to renewable energy development. The regime complex supports the development of human and institutional capacity, reducing technical and institutional barriers to renewable energy development through the capacity-building

mechanism. These mechanisms work in concert, and their interplay is critical to fostering change. Financial assistance through the utility modifier mechanism is crucial to filling financial gaps or reducing financial risks associated with investing in EMDEs. The clean energy regime complex is most effective when it can facilitate long-term change in norms and perspectives around energy transitions. Financial assistance via the utility modifier mechanism is unlikely to lead to long-term change if it is not combined with normative diffusion (through social learning) and capacity building. However, the interplay of these mechanisms does not guarantee success in terms of ushering in an energy transition, as the clean energy regime complex encounters technology and policy lock-in and vested interests at the domestic level.

I argue that the clean energy regime complex can be effective when it addresses barriers to renewable energy deployment and seizes opportunities when domestic political will is high and energy security concerns over an energy transition can be assuaged. An exogenous shock and energy crisis may trigger opportunities for change to occur, but the regime complex must address the domestic blocking factors and technology and policy lock-in through the mechanisms of effectiveness. The regime complex can provide financial incentives to interest groups or to fund alternative technologies to encourage convergence of domestic political interests (utility modifier mechanism). Through the social learning mechanism, the regime complex can help promote alternative policies, technologies, or problem-solving approaches through policy advising, which can further support convergence of domestic political interests in the techno-political elite. The clean energy regime complex, via the capacity-building mechanism, can overcome technology lock-in by providing technical workforce development support or technical assistance for deploying alternative technologies.

It is crucial to examine how the clean energy regime complex can be effective in spurring clean energy transitions in EMDEs, but to do this, we must examine regime complex influence on domestic politics. This book provides a framework for understanding how a regime complex can be effective in changing and influencing domestic politics, particularly in EMDEs. The framework outlined in this chapter offers a lens to examine governance in a world of complexity, through a focus on mechanisms and pathways to overcome lock-in and facilitate change at the domestic level.