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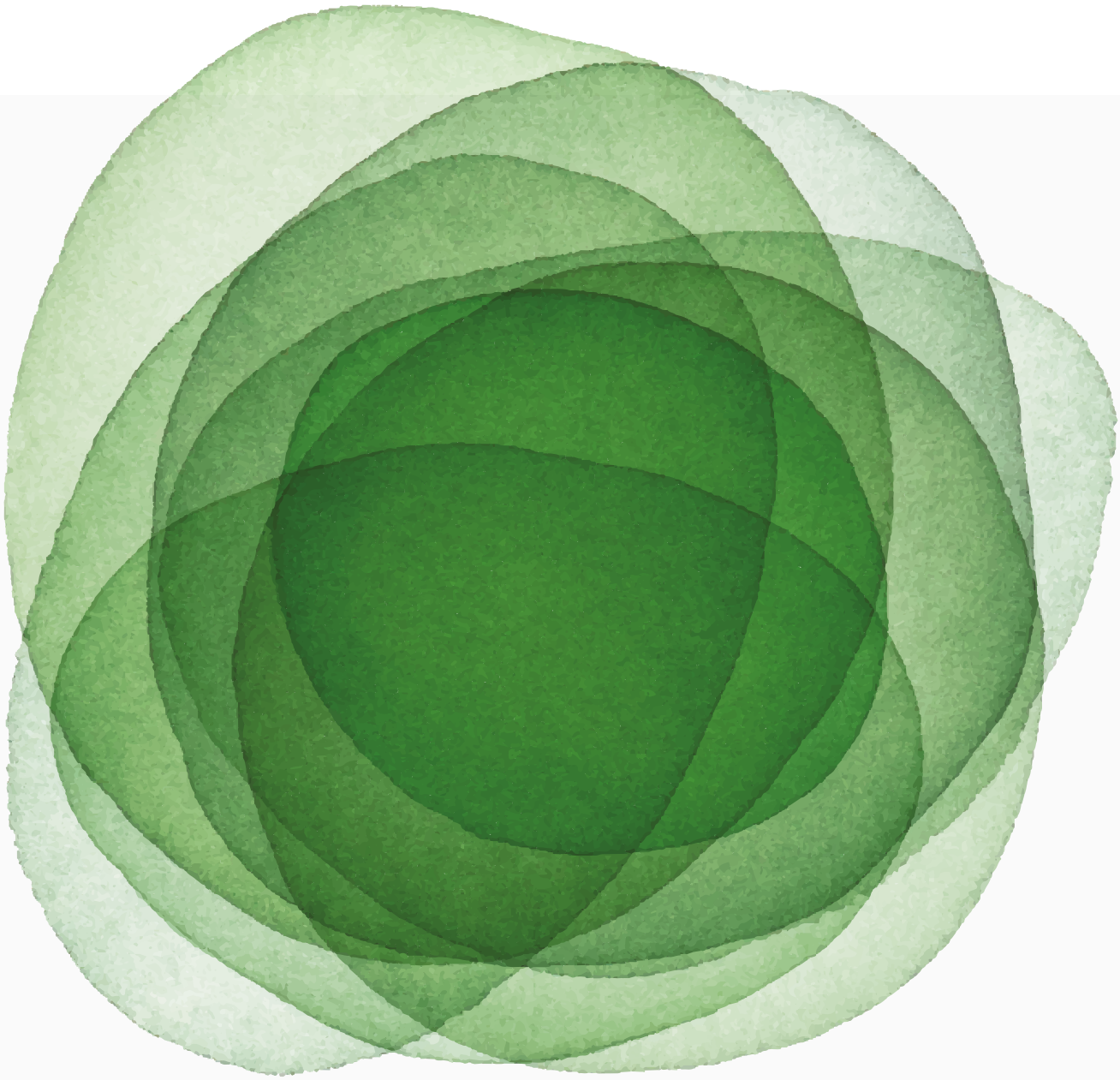
Governance of Emissions Trading Systems



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EMISSIONS TRADING CONTINUES TO EXPAND AS A FLEXIBLE POLICY RESPONSE TO CLIMATE CHANGE.

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EXECUTIVE SUMMARY

Emissions trading continues to expand as a flexible policy response to climate change. Its implementation raises complex governance challenges, however, and calls for robust institutional, regulatory and procedural frameworks. Unlike aspects of technical design and implementation, the governance of emissions trading systems (ETSs) has found less extensive treatment in the available knowledge base. However, existing systems offer valuable insights into the successful governance of emissions trading from the initial establishment and routine operation of an ETS to the review of its performance and the management of change. This report draws on such experiences to provide guidance on the governance of an ETS across all stages of its evolution.

Governance relates to the ways in which authority is channeled at multiple levels and through a variety of actors to manage social affairs. Research has shown the relevance of governance for successful policy design and implementation, including in the context of climate change. Governance functions are exercised by public and private actors, such as the three branches of government – that is, the legislative, executive, and judicial branches – as well as non-governmental organizations (NGOs), market service providers, and the media. These carry out their roles through different tools and processes, including policies that influence individual or collective behavior. Successful governance tends to be characterized by a high level of participation, transparency, and accountability, adherence to the rule of law, efficiency, and fairness. Although these are not principles in a formal sense, they can guide governance decisions.

Premised on an artificially constrained supply of emission units created via policy decision, ETSs pose unique governance challenges at every stage of their design and implementation. With an incentive structure that differs from more traditional markets and with traded units that are intangible and instantly transferable in significant quantities, ETSs can be susceptible to strategic and fraudulent market behavior. Sound governance of an ETS and the market it engenders is therefore key to manage and prevent such risks. As with governance more generally, the governance of an ETS relies on the activities of various actors and recruits a number of tools and processes. Some actors, such as the public agency mandated with administering the ETS, are specific to emissions trading, while others, such as financial intermediaries and trading platforms, can also be found in other markets.

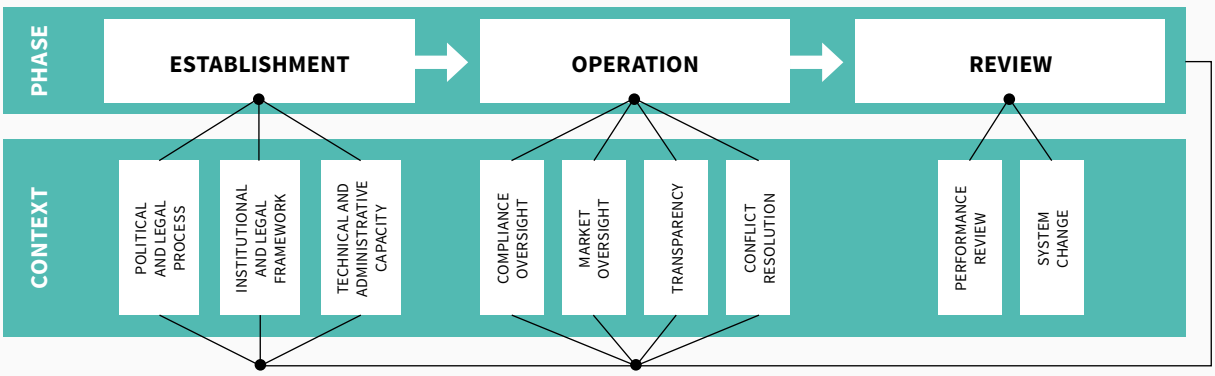
Overall, an ETS follows the same cycle as other policies, from its initial establishment through its routine operation to its review and amendment. Each phase in this cycle is characterized by a distinct set of governance contexts. For instance, when establishing an ETS, aspects related to governance already emerge during the preceding political and legal process and extend to the creation of a legal and institutional framework, as well as the provision of technical and administrative capacities. Routine operation of an ETS, in turn, gives rise to governance functions in the context of compliance and market oversight, transparency, and conflict resolution. Finally, reviewing how an ETS performs is its own governance context, and can result in system changes. Figure 1: Governance Phases and Contexts of an ETS below illustrates the governance contexts encountered in each phase of an ETS.

Each of these governance contexts entails different governance functions, with their own actors, tools, and processes. When establishing an ETS, governance functions that need to be met in the preceding political and legal process range from engaging stakeholders and building consensus to adoption of a robust legal basis and performing a regulatory impact assessment. As this inception phase of an ETS proceeds to the elaboration of its institutional and regulatory framework, it requires defining institutional responsibilities, deciding on its level of formality and centralization, and embedding it in the existing legal system. Governance of an ETS also requires ensuring sufficient capacities – such as technical expertise, professional staff, and financial resources – of relevant authorities and stakeholders, including compliance entities.

Governance relates to the ways in which authority is channeled at multiple levels and through a variety of actors to manage social affairs.

Once the ETS has been established, the phase of routine operation begins, which introduces new governance contexts and needs. In this phase, governance functions relate to compliance oversight, which includes oversight of emissions reporting, collecting and managing emissions data, and performing accre-

Figure 1: Governance Phases and Contexts of an ETS



ditation and oversight of verifiers; market oversight, which includes determining conditions of market access and participation, regulating market activities as well as traded units and financial products, and implementing safeguards against market manipulation and fraud; transparency, which includes disclosure of emissions data and information about ETS performance and market activities to selected stakeholders or the broader public; and conflict resolution, including in the event of judicial proceedings.

Finally, at certain points in its evolution, an ETS will face the need for a review of its performance and potentially for adjustment or modification.

Such a review will often be mandated at periodic intervals in the legal framework, but it can also be discretionary, for instance in response to unforeseen developments. If the review culminates in a decision to modify the ETS, many of the governance functions already encountered during its initial establishment acquire relevance again. Managing system change can range from minor design recalibrations to more fundamental changes, such as the expansion of an ETS to new sectors and activities, the establishment of a link to another ETS, or finally, the termination of an ETS. Table 1 below maps governance functions in each governance context, based on the relevant governance principles.

Table 1: Principles of Successful ETS Governance

Transparency	Transparency	Disclosure of Emissions and Market Data
	Compliance Oversight	Oversight of the Compliance Cycle
	Market Oversight	Oversight of Market Actors and Activities
Accountability	Compliance Oversight	Oversight of the Compliance Cycle
	Market Oversight	Oversight of Market Actors and Activities
	Conflict Resolution	Resolving Judicial Disputes or Mediation
Rule of Law	Political and Legal Process	Creating a Robust Legal Basis
	Institutional and Regulatory Framework	Defining Institutional Responsibilities
		Deciding the Level of Formality/Centralization
		Embedding in the Broader Legal Framework
	Conflict Resolution	Resolving Judicial Disputes or Mediation
	System Change	Managing Modifications to the ETS
Effectiveness and Efficiency	Political and Legal Process	Regulatory Impact Assessment (RIA)
	Technical and Administrative Capacity	Capacity Needs of Public Authorities
		Capacity Needs of Different Stakeholders
	Market Oversight	Oversight of Market Actors and Activities
	Performance Review	Assessing the Performance of the ETS
	System Change	Managing Modifications to the ETS
Equity and Fairness	Political and Legal Process	Regulatory Impact Assessment (RIA)

Table 2: Governance Functions during the Operation of an ETS

Phase	Governance Context	Governance Function
Establishment	Political and Legal Process	Stakeholder Engagement and Consensus Building
		Creating a Robust Legal Basis
		Regulatory Impact Assessment
	Institutional and Regulatory Framework	Defining Institutional Functions and Responsibilities
		Deciding the Level of Formality and Centralization
		Embedding in the Broader Legal Framework
	Technical and Administrative Capacity	Capacity Needs of Public Authorities
		Capacity Needs of Regulated Entities and Other Stakeholders
Operation	Compliance Oversight	Oversight of the Compliance Cycle (MRV and Enforcement)
	Market Oversight	Oversight of Market Actors and Activities
	Transparency	Disclosure of Emissions and Market Data, Information on Revenue Use
	Conflict Resolution	Resolution of Judicial Disputes or Mediation
Review	Performance Review	Assessing the Performance of the ETS and the Need for Modifications
	System Change	Managing Modifications to the ETS, including Linking and Termination

Unlike aspects of technical design and implementation, the governance of emissions trading systems (ETSs) has found less extensive treatment in the available knowledge base.

01. Introduction

Emissions trading has seen growing popularity as a flexible policy response to climate change, although its implementation gives rise to complex governance challenges. Unlike technical design and implementation, the governance of emissions trading systems (ETSs) has found less extensive treatment in the available knowledge base. This report draws on experiences in existing systems to offer guidance on the governance of an ETS across the various stages of its evolution.

Emissions trading is a policy instrument based on tradable units that allow covered entities to emit a specified amount – usually a metric ton – of GHG emissions over a specified period of time. By enabling trade in such units, an ETS creates a market in which the opportunity cost of emissions is revealed by the forces of demand and supply, resulting in an explicit price on carbon. It offers compliance flexibility by decentralizing the decision about where and when to abate GHG emissions and incentivizes abatement where it is cheapest. By levelling the cost faced by covered entities for each ton of emissions, this approach helps achieve climate policy objectives at the lowest overall cost (Fischer and Newell 2008).

Given these benefits, emissions trading has enjoyed growing popularity as a scalable and cost-effective response to climate change. Following earlier experiences with emissions trading for air pollutants and inclusion of an international mechanism for emissions trading between states in the 1997 Kyoto Protocol (Cole 2016), it has seen substantial uptake at the regional, national and subnational levels. European countries introduced the first domestic systems for GHG emissions, culminating in the establishment of the European Union Emissions Trading System (EU ETS) in 2005. ETSs were subsequently deployed in North America and the Asia-Pacific region, and new systems are currently emerging in Latin America and Asia. At the start of 2021, 24 ETSs were in force in 36 jurisdictions, covering 16% of global GHG emissions (ICAP 2021). When China launched a national ETS in 2021, emissions coverage almost doubled (World Bank 2021b).

ETSs come in a variety of shapes and forms. Most systems are mandatory, requiring compliance by covered entities, but some allow for voluntary participation. A majority of ETSs have absolute GHG emission ceilings, or 'caps', although some are subject to an emissions intensity target, where the limit on emissions is set relative to a particular output, such as the carbon intensity of a unit of product. Some cover only one sector or activity, while others aim for comprehensive coverage of all major sources of emissions across the economy. There is thus no single template for an ETS, and the design will invariably reflect the circumstances in the implementing jurisdiction. What all ETSs have in common, however, is that they raise a complex set of governance challenges.

Sound governance is critical to ensure a functioning ETS, placing high demands on the institutional, regulatory, and procedural frameworks within which it operates.

Sound governance is critical to ensure a functioning ETS, placing high demands on the institutional, regulatory, and procedural frameworks within which it operates. Reflecting the foregoing heterogeneity, no universal prescriptions exist for successful ETS governance. Even more than its technical design, the governance of an ETS depends on the specific context in which it is implemented, which may explain the relative scarcity of relevant guidance material and recommended practices. Still, with a growing experience base, existing ETSs offer valuable insights into different aspects of this challenge. Drawing on insights from established and emerging ETSs, this report introduces central concepts and principles related to governance (Chapter 2), describes the main governance requirements in an ETS (Chapter 3), and subsequently traces relevant experiences made across three stages in the evolution of an ETS: its initial establishment (Chapter 4), its subsequent operation (Chapter 5), and its review and modification (Chapter 6).

02. What Is Governance, and Why Does It Matter?

Governance relates to the ways in which authority is channeled at multiple levels and through a variety of actors to manage social affairs. Although contemporary notions of governance extend beyond the state, this report focuses on the exercise of public authority through formal institutions. Research has shown the relevance of governance for successful policy design and implementation, including in the context of climate change. This chapter defines the concept of governance and discusses its importance, before proceeding to identify relevant actors, tools and processes, as well as a series of principles that can guide sound governance decisions.

2.1 Defining Governance

Governance can be understood as "the process through which state and nonstate actors interact to design and implement policies within a given set of formal and informal rules that shape and are shaped by power" (World Bank 2017). Derived from the ancient Greek verb kybernan (κυβερνάω), a nautical term to describe the steering of a ship, governance was traditionally associated with the activity of ruling, and thus with public authority exercised through formal government institutions such as executive, judicial and legislative bodies. As the relationship of state and society evolved, however, this understanding has expanded beyond government to include social practices at multiple levels – international, national, regional and local – as well as private forms of governance.

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Contemporary governance encompasses the activities of governments as well as many other channels through which authority can be exercised (Rosenau 1995). As a result, the concept is exceptionally broad – representing "the sum of the many ways individuals and institutions, public and private, manage their common affairs" (Commission on Global Governance 1995) – and manifests itself at different and often overlapping levels, rendered operational through a complex network of actors and interests. In this report, the focus will largely rest on the exercise of public authority through formal government institutions, including the tools and processes through which these institutions manage public policies (see also below, Chapter 2.3).

Applied to the context of climate change, governance displays a similar conceptual breadth. Climate governance has been described as "all purposeful mechanisms and measures aimed at steering social systems towards preventing, mitigating, or adapting to the risks posed by climate change, established and implemented by states or other authorities"(Jagers and Stripple 2003). Much of this will occur at the level of changing ideas, norms, and expectations to bring about shifts in interest perceptions and to foster stable and supportive coalitions for change (Meadowcroft 2009).

Again, however, this report takes a narrower view of governance that is focused on the role of government institutions as architects and especially as implementers of climate policy. Acknowledging the importance of governance for climate policy design and implementation, the Intergovernmental Panel on Climate Change (IPCC) has stated that "institutions and processes of governance shape and constrain policy-making and policy implementation in multiple ways relevant for a shift to a low carbon economy" by setting the incentive structure and political context of decision making, and by affecting patterns of thinking and understanding of policy choices (IPCC, 2015). That interface between governance and climate policy – applied to a particular climate policy, emissions trading – is the central focus of this report. Why it matters is explained next.

2.2 Why Governance Matters

It makes intuitive sense that governance matters. Nonetheless, the elusive boundaries of the concept make it difficult to capture its relevance in straightforward terms. Systematic research on the role of governance has primarily occurred in the study of economic development, where measurement of a variety of governance indicators suggests a strong causal relationship with improved social and economic development outcomes (Kraay, Zoido-Lobaton, and Kaufmann 1999). Such is the link between

governance and economic wellbeing that it was once declared "perhaps the single most important factor in eradicating poverty and promoting development" by a former Secretary-General of the United Nations (Annan 1998).

Specifically, robust governance has been associated with functioning and accountable institutions that stakeholders regard as legitimate, through which they participate in decisions that affect their lives, and by which they are empowered. In contrast, weak governance has been linked to unpredictable or arbitrary government behavior, excessive rules and regulations, misallocation of resources, and lack of transparency in decision making (World Bank 1992). How well institutions govern is not always a matter of choice. However, a lack of human and financial resources can significantly hamper the capacity for governance. Thus, in the exercise of public authority, governance is both a function and determinant of the capacity of governments to prepare, implement, and enforce policies, and to review and improve their performance over time.

Climate policy is no exception. Empirical research has, for instance, revealed that perceptions of weak governance coincide with weaker climate policies (Rafaty 2018). Investigating the political economy of carbon pricing – including, specifically, emissions trading – another empirical study of 167 national and 95 subnational jurisdictions identified well-governed institutions as one of two conditions for successful implementation (Levi, Flachsland, and Jakob 2020). In particular, it found that three governance indicators – perception of corruption, lack of technical capacity, and the absence of independent institutions – affect the likelihood that a carbon price is adopted, and also have a bearing on the level of the carbon price in that jurisdiction. Public trust in governments has likewise been shown to correlate positively with carbon pricing levels (Klenert et al. 2018).

The many ways in which governance acquires relevance in the context of an ETS will be revisited in greater detail in Chapter 3 below. What past research has sufficiently established, however, is that governance matters across all stages of the policy cycle,[1] from the initial formulation through implementation to the eventual evaluation of policy results. That is also the framing used in the main section of this report, in which relevant governance functions are identified and discussed for each of the main phases in the evolution of an ETS, namely its establishment, its routine operation, and finally, its periodic review and the management of change. Before turning to the role of governance in an ETS, the remainder of this chapter will describe key actors, tools and processes of governance, along with a set of principles that have been suggested as conditions for successful governance.

2.3 How Governance Occurs: Actors, Tools and Processes

As indicated earlier, governance is by nature a broad concept. Its academic study is often highly abstract and theoretical, assessing, for instance, the role of hierarchies, markets, and networks in the coordination of social action. Without diminishing the importance of such scholarship, this report intentionally assumes a narrower and more applied focus, with a specific interest in the exercise of public authority by formal government institutions and selected stakeholders. Starting with a more concrete understanding also allows for the identification of a typology of channels through which governance manifests itself in practice, including in the design and implementation of policies.

In the theoretical literature, governance is sometimes broken down into a structural and a process dimension, distinguishing between its institutionalized manifestations and the modes through which it effects social coordination (Börzel, Risse, and Draude 2018). For this report, the structural dimension is further dissected into the more concrete channels of actors and

(1) On the concept of the policy cycle, see Section 2.3 below.

tools of governance (see Figure 3). Like the concept of governance itself, however, these channels have fluid boundaries and can overlap along the margins. Creation of a new administrative entity can, for instance, be a tool for governments to exercise public authority, yet that entity can then become an actor in its own right. Likewise, some tools, such as information disclosure, can evolve into a continuous process.

Rather than provide conceptual precision, the channels highlighted in this section are meant to help visualize the ways in which governance occurs. While the specific details vary, these channels manifest themselves at all levels of governance, including different geographic levels – local, national, or international – as well as public, private, and hybrid governance. Different levels of governance can interact and influence each other, adding new channels and a further layer of complexity. Below, the main channels of governance are described in greater detail, with examples used to further illustrate their significance in practice.

Actors. In the context of governance, actors denote individuals or a group of individuals in formal and informal organizations who are engaged in purposive action to exercise governance or influence it, or who are, in turn, affected by it. Although the relevant actors will vary depending on the context – with different sets of actors shaping local, national, and international governance processes – the primary actors are usually formal government institutions, such as legislative, judicial or administrative bodies. Legitimized through a social contract with the constituency whose interests they represent, governments and their bureaucracies are endowed with the ability to reach binding decisions and enjoy a monopoly on enforcement through sanctions.

Still, the public sector is by no means the only relevant actor. Many private actors – both formal and informal – play important roles in governance, including business, NGOs, political parties, research institutes, and the media. Finally, to the extent that it is not organized through civil society organizations such as NGOs, the general public – as the entirety of private citizens – can become an important actor, for instance when it is the addressee of public disclosures or a stakeholder in public consultations. As Chapter 3.2 will show, private actors are involved at various points in the governance of an ETS.

Tools. When engaging in governance, these actors can draw on a wide variety of tools to achieve desired governance outcomes. Tools include different

Figure 2: Dimensions and Channels of Governance

GOVERNANCE DIMENSION	STRUCTURAL		PROCESS
GOVERNANCE CHANNEL	ACTORS	TOOLS	PROCESSES
EXAMPLE(S)	GOVERNMENT INSTITUTIONS, NGOS	INFORMATION, POLICIES	LEGISLATIVE PROCEDURES, POLICY CYCLE

material and ideational resources used in the course of governing, such as staff, finance, or information. Information, for instance, can take the form of innovative ideas, technical expertise, or statistical data. Tools also encompass relevant services and infrastructure, such as databases to access such data. One tool acquires particular importance in the exercise of public authority, however, and merits a more detailed description: the formulation and implementation of policies.

Broadly understood, policies are actions which set out objectives and the means to achieve them (Howlett and Cashore 2014). Although actors other than governments can adopt policies, this report focuses on public policies, which are statements by a government of what it intends to do or not to do, or what it encourages or requires public and private actors to do or not to do (Birkland 2020). Most often, these statements take the form of laws, regulations, rulings, decisions, orders, plans, guidelines or other expressions of government policy to shape and control social outcomes. They do so by influencing individual or collective behavior – for instance that of organizations – through incentives and prohibitions, rights and obligations, planning measures, and other types of government intervention in social affairs, including in markets.

As governance has become more decentralized, however, there has also been a shift in the types of policies governments rely on. Public authority exercised by administrative institutions is increasingly being complemented by the activities of autonomous stakeholders who undertake some of the work of governing, implementing policies, providing public services, and even regulating themselves (Bevir 2012). Public-private partnerships (PPP) exemplify such forms of hybrid governance, consisting of one or more government actors cooperating with private actors through loose alliances or formal agreements to jointly deliver a public service. Contracting out relevant services is also common in the operation of ETSs, where private actors have taken on a number of important governance functions under a PPP (see below, Chapter 4.2.1).

Processes. Processes are a series of actions taken in order to achieve a particular outcome, and may occur once or recur periodically. They can assume the shape of formal procedures, such as the legislative process with its precisely defined steps and roles of different actors, or be more informal, such as informational outreach and knowledge exchange in the course of capacity building activities. Processes are thus central to governance, although one particular process is usually excluded from its scope: the political process. Whereas politics focuses on the often antagonistic process of reconciling different interests to reach collective decisions, governance is instead more interested in the administrative and procedural elements of governing (Offe 2009).

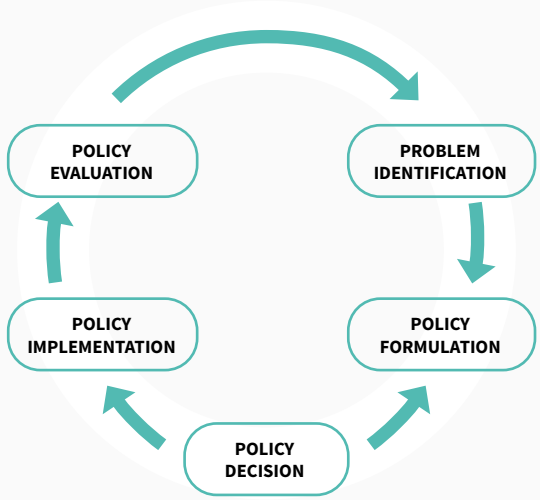
Processes are also very relevant for the formation and implementation of policies, one of the central tools of governance. Policies are not static, but part of an ongoing technical and political process in which policy choices and their effects are continually assessed and revisited. A useful concept to illustrate the role of process in public policy making is that of the policy cycle, which describes an idealized sequence of how policies are formulated, implemented and assessed (Lasswell 1971). While different iterations of the policy cycle have been proposed, they commonly identify a number of similar stages in the policy process (Cairney 2020). The policy cycle begins with the identification of a problem and deciding whether or not it should be included in a policy agenda. If it is included in the policy agenda, the process continues with the formulation of a policy proposal, which involves defining the policy objectives, identifying alternative policy options, estimating their costs and effects, and choosing the most appropriate solution.

Once a policy proposal has been formulated, it requires legitimation to ensure political support, which can occur through a legislative or executive decision or a public referendum, and frequently involves seeking consent through consultations with interest groups. With that decision, the policy is either rejected or approved, often with extensive modifications. If approved, the policy then proceeds to implementation, which often entails designating or creating a responsible institution and ensuring that it has the necessary authority and resources. Over time, the policy is evaluated by assessing its impacts and outcomes in order to determine whether it is having the desired effects and should be maintained, amended or terminated (see Figure 3).

2.4 Successful Governance: Guiding Principles

Understanding the channels through which governance is exercised offers an opportunity to evaluate its performance in practice. It is, however, intrinsically difficult to define what constitutes "successful" or "good" governance: not only is the concept itself complex, as was shown earlier in this chapter, but the importance of the context in which governance occurs precludes easy identification of universal metrics and prescriptions. In the fields of development cooperation and public sector reform, evaluation indicators are used to measure how states meet vital governance functions, but such indicators – and the assumptions they are premised on – have not been without criticism. Objections have been leveled against the perceived biases that such indicators conceal, as well as conceptual inconsistencies that follow from mingling descriptive and normative criteria in the evaluation frameworks (Gisselquist 2012).

Figure 3: The Policy Cycle[2]



Still, that does not rule out the usefulness of insights drawn from past experience in the exercise of public authority, and the guidance that such insights can yield for governance. Over time, the observation of different practices has allowed for the narrowing down of governance patterns that correlate with the achievement of desired outcomes. Acknowledging the varying role of context in each specific case, these patterns have been purposefully articulated in the form of loose criteria, objectives or principles that avoid being overly detailed or prescriptive. One example is Sustainable Development Goal 16 (SDG 16), which calls for states to "build effective, accountable and inclusive institutions at all levels" (United Nations 2015).[3] Another are the general categories used to group a set of Worldwide Governance Indicators (WGI) developed by the World Bank, which frame governance in terms of the inclusiveness and independence of government, as well as the quality of policies and their implementation (Kaufmann, Kraay, and Mastruzzi 2010).[4]

A number of features tend to recur across these different frameworks to understand the quality of governance: procedural features, such as the degree of participation and transparency in the exercise of public authority; features related to governing capacity, including the availability and expertise of professional staff, or the availability of financial

(2) Based on Lasswell (1971) (3) Ten "outcome targets" operationalize SDG 16, of which the following have a clear bearing on governance: "promote the rule of law and ensure equal access to justice"; "substantially reduce corruption and bribery"; "develop effective, accountable and transparent institutions"; "ensure responsive, inclusive and representative decision-making"; "strengthen the participation in global governance"; and "ensure public access to information and protect fundamental freedoms." (4) This index, developed as part of a project administered by the World Bank and the World Bank Institute, identifies aggregate and individual indicators for more than 200 countries across six dimensions of governance: voice and accountability, political stability and lack of violence, government effectiveness, regulatory quality, rule of law, and control of corruption, see

resources; and features related to the actual results of governance, including its effectiveness and fairness. Of these three sets of features, the latter is the most contested, as they are likeliest to introduce subjective value judgments and raise questions about causal attribution (Fukuyama 2013). Frequently included as a separate category is adhesion to the rule of law, where interpretations again vary, but core features – such as the impartiality and accountability of public authority, protection of individual and collective rights, and an absence of corruption – are commonly acknowledged.

Table 3 below lists a number of such recurring features and briefly describes their main implications. For the sake of simplicity, they are labeled "principles", although that designation does not imply a formal or universally accepted status.[5] The list is neither exhaustive, nor free of conceptual overlap. Also, it comes with an important caveat: no abstract principle can account for all the unique circumstances encountered in a practical context, and some involve a greater degree of subjectivity in their application than others. As such, these principles are primarily meant as a heuristic guide, and not as a prescription of particular outcomes. Even without explicit reference, however, the principles manifest themselves at various stages in the governance of an ETS, and will therefore be revisited in later parts of this report.

Table 3: Principles of Successful Governance

Principle	Description
Participation	Active and informed involvement of all affected or interested stakeholders in a decision-making process, whether directly or through representatives, and facilitated through formal and informal procedures such as consultations, hearings, surveys, and meetings
Transparency	Information on matters of public concern, including decision-making and implementation processes, is disclosed and made accessible to the public or to affected stakeholders in appropriate formats, in some cases subject to a right or guarantee of access to information
Accountability	Accountability implies answerability or responsibility for an action or outcome. Accountable parties, such as government institutions or officials, are answerable for the consequences of decisions they have taken, whether politically or within the organizational hierarchy they form part of
Rule of Law	Rule of law requires that the government act within the limits of its powers as prescribed by law, through impartial exercise of legislative, executive and judicial authority, respectful of individual and collective rights, within the boundaries of clear, determinate, and stable laws and a rule-based process
Effectiveness and Efficiency	Institutions, processes and actors involved in governance have the capacities to meet the needs of society while making the best use of the resources at their disposal, ensuring timely delivery of public services through a professionalized bureaucracy and avoiding unnecessary administrative cost
Equity and Fairness	Equity and fairness require that distributional impacts, especially on the most vulnerable, be taken into consideration during governance, ensuring that everyone has a stake in the outcome and no one feels alienated

(5) Instead, the term "principle" is used loosely here, to denote a general proposition or value that serves as a guide for behavior or evaluation.

03. Governing Emissions Trading Systems: An Overview

This chapter connects the conceptual framework outlined in the previous chapter to concrete governance requirements in an ETS. To that end, it describes the importance of governance for a functioning ETS, and introduces relevant actors, tools and processes. It subsequently highlights governance challenges at various phases in the evolution of an ETS, from its establishment through its operation to its review and amendment. Finally, it applies the principles of successful governance identified in the previous chapter to the context of emissions trading.

3.1 Emissions Trading and the Governance Challenge

With any market, governance is critical to secure the conditions needed for an efficient allocation of resources (Stiglitz 2012). However, as was already observed early on in the development of carbon trading, an ETS – which is premised on an artificially constrained supply of emission units created via policy decision – poses a unique set of governance challenges (Newell, Jenner, and Baker 2009). In jurisdictions with limited administrative capacities or lacking experience with markets, such challenges may be particularly pronounced (Bell 2003; 2006). Commentators have even suggested that, in the absence of robust governance structures, abusive market behavior could proliferate and severely erode the benefits of an ETS (Nordhaus 2005).[6] As an ETS moves from theory to practice, its conceptual simplicity thus gives way to a complex governance reality.

ETS governance is closely related to, yet also distinct from, more technical aspects of ETS design and implementation. Whereas the choice of alternative design options, for instance, will be guided by how well these options secure agreed policy objectives and at what cost, the governance dimensions of this choice relate to the process through which that decision is reached, the actors involved in the process, and the tools used to support the decision. Similarly, technical aspects of implementation, such as the definition and periodic update of emission factors to quantify emissions from covered activities, go hand in hand with governance concerns, such as the transparency or confidentiality of emissions information, accountability for inaccurate reporting, and institutional capacities to process and store data. Boundaries can be fluid, and this report often introduces the technical dimensions of ETS design and implementation to provide context for their governance implications.

Virtually all stages of ETS design and implementation entail a governance dimension, from the initial decision to establish an ETS to enforcing compliance with its rules and reviewing its operation. As will be shown below, governance challenges manifest themselves differently across each stage of ETS design and implementation, yet all of which place high demands on the actors involved in relevant governance processes. Ensuring sufficient capacity of these actors, including technical expertise and professional staff, is therefore an important condition of successful ETS governance, with such capacity often having to be newly created (Brewer and Mehling 2014). Adequate capacities are not only required within government, moreover: shortfalls among other stakeholders – such as covered emitters – can erect barriers for the successful operation of an ETS. Addressing the underlying cognitive,[7] organizational, and political deficiencies can take time and require significant resources.

Governing an ETS is more than a matter of ensuring adequate capacities, however. Some governance challenges are owed to the unique incentive structure in an ETS, which differs fundamentally from that of most traditional markets: as long as transacted units remain eligible for compliance purposes, market participants can afford to be indifferent about the integrity of such units. Units are intangible in nature – which allows the transfer of large quantities almost instantly – and their supply is largely inelastic, because it is based on political decisions more than market signals. All these factors render an ETS more susceptible to price volatility and extremes, as well as strategic or fraudulent market behavior (Hahn 1984; Hintermann 2011).

Such vulnerabilities have occasionally manifested themselves in practice, with detrimental effects for the operation of the ETS and its support among stakeholders and the broader public. Risks in the market for emission units became particularly visible in a string of criminal activities encountered early on in the EU ETS, including value-added tax (VAT) fraud, phishing attempts on a national registry, and a series of cyber-thefts (Europol 2009; Interpol 2013; Guegan, Lassoudiere, and Frunza 2011; Keyzer et al. 2012, 13;

(6) Referring to international emissions trading under the Kyoto Protocol and observed instances of fraudulent accounting, Nordhaus expressed concern that "cheating will probably be pandemic in an emissions trading system that involves large sums of money."

Nield and Pereira 2016). Although the technical and regulatory loopholes that enabled these incidents were promptly rectified, they illustrate the stakes at play in ETS governance.

A desire to avoid such events may tempt policy makers to seek the strictest regulatory framework possible. Doing so would also increase the administrative burden, however, as well as the transaction costs faced by market participants. Not only might that diminish market liquidity and the efficiency of price discovery (Stavins 1995), but it could altogether deter market participation (Nordhaus 2005). Ideally, therefore, the governance framework of an ETS will identify a workable balance between stringency and flexibility, in itself a daunting task. Given the political nature of emissions trading as a policy with often significant distributional implications, any such balance will be constantly tested by pressure from different stakeholders, ranging from compliance entities to public interest groups.

Like other climate policies, an ETS is exposed to rent seeking behavior at different stages of its evolution, but the complexity of this policy approach arguably expands the number of entry points for stakeholder influence (Grumbach 2015; Meckling 2011). Stakeholders have, for instance, sought to influence the design of an ETS to increase flexibility, maximize rents, and weaken compliance oversight and penalty rules (Markussen and Svendsen 2005). Additionally, while emissions trading can reduce the economic cost of achieving a defined mitigation target, it may not always distribute the resulting burden in ways that are considered fair or politically acceptable. Successful governance of an ETS therefore requires engaging affected constituencies while securing the impartiality and independence of relevant decision making. Because of the importance of sustained confidence in the functioning of an ETS (Smith and Mayer 2018), creating the right conditions for dialogue and mutual understanding may ultimately be the most important purpose served by its governance framework.

Overall, a number of governance requirements have to be met for an ETS to function. These requirements differ for each stage in its evolution, and involve different channels of governance. A survey of these channels – again broken down in relevant actors, tools, and processes – is presented in the next section, followed by a taxonomy of governance functions in relation to key phases of emissions trading. Finally, the broad principles of successful governance identified in the previous chapter are discussed in the context of an ETS, and correlated to the individual governance functions for better illustration.

3.2 Governing an ETS: Actors, Tools and Processes

An earlier chapter of this report described the general channels through which governance can occur, singling out relevant actors, tools, and processes (see Chapter 2.3). These channels can also be identified in the context of an ETS, where governance relies on the activities of various actors and recruits a number of tools and processes. Because an ETS entails the creation of a market, these channels differ in important ways from those found in the governance of most other climate policies. In fact, some of the channels that play a role in the governance of an ETS originated in other markets, such as the financial market, from which approaches to govern market behavior have been drawn on when regulating emissions trading. This section provides a general overview of the actors, tools, and processes relevant to the governance of an ETS, while later chapters provide greater detail on specific channels in their respective context.

Actors. As in governance more generally, the public sector plays a central role in governing an ETS. The public sector, in this case, includes all three branches of government: legislative, executive, and judicial. By far the most visible is the executive branch, where relevant functions may be distributed across several entities or concentrated in one entity that has overall responsibility for the administration of the ETS. In jurisdictions with distributed responsibilities, decisions about system design – including political

coordination and rulemaking – are often reserved to the highest level of the executive branch, such as a national ministry or department, whereas technical implementation and enforcement may be delegated to subordinate bodies at the national, regional or local level. Often, the entity tasked with facilitating and supervising the routine operation of the ETS – which may be an existing or a newly created administrative agency – will serve as the main contact point for compliance entities and other stakeholders, and is therefore known as the 'ETS administrator'.

Other parts of the executive branch can also become involved in ETS governance, for instance those agencies responsible for overseeing financial and energy markets, managing statistical data, or defining economic and industrial policy. Depending on the scope of the ETS and its design, government entities responsible for administering the transport sector and the agriculture and forestry sectors may become relevant, as may the treasury if there is auctioning revenue. Although less visible, the legislative and judicial branches of government also enjoy important roles: the legislature when it comes to establishing a formal legal basis for the ETS, and the judiciary when it comes to resolving disputes arising in the context of emissions trading.

On the other side of the dividing line between public and private sector are the compliance entities (also referred to as 'regulated entities'), that is, those actors – such as electricity generators or industrial facilities – whose GHG emissions are covered by the ETS, and who are therefore subject to compliance obligations. In most systems, these tend to be individual installations owned by private companies, although some ETSs cover companies rather than installations, and some also include partially or wholly state-owned enterprises (SOEs).

Compliance entities may be the main addressees of governance under an ETS, but private sector involvement extends well beyond them: a wide variety of service providers also contribute to the different governance functions. Financial intermediaries, such as banks or brokers, provide liquidity and risk management through lending and brokerage services as well as derivative products (see Chapter 5.3).

Similarly, exchanges and clearing platforms improve market transparency and reduce counterparty risk. Project developers originate and implement offset projects. Other service providers, such as legal and accounting professionals as well as consultancies, help market participants understand and meet regulatory obligations, and also promote harmonization of practices and overall compliance. Interest groups, such as trade associations and environmental advocacy groups, aggregate and articulate the preferences of their members in key governance processes. Analysts and, more generally, the media provide market intelligence and increase transparency, helping inform market decisions and foster overall trust in the ETS.

Some actors sit at the interface of public and private sector, operating as Public-Private Partnerships (PPPs). These are themselves organized as private entities, but with a mandate to carry out public functions. Among these are accredited verifiers, who support the ETS administrator and its oversight responsibilities by auditing the emission reports of compliance entities. Similarly, exchanges are charged with ensuring their members adhere to disclosure requirements and other safeguards set out in financial market regulations. Some systems delegate more comprehensive governance functions to private actors, such as the tracking and allocation of emission units and overall market monitoring (see Chapter 4.2.1). Finally, different standardization bodies help develop and administer common rules and guidance, for instance on the MRV of emissions or offset projects, that are then recognized or applied for compliance purposes. Table 4 below provides an overview of actors involved in ETS governance and gives examples for each category.

(7) 'Cognitive', in this context, refers to the informational deficiencies – such as information asymmetries – of administrative institutions, as well as the bounded rationality and cognitive biases of administrative personnel (see Viscusi and Gayer 2015).

Table 4: Actors in ETS Governance

Actor		Function	Example(s)
Public	ETS Administrator	Overall management of the ETS	California Air Resources Board (CARB), German Emissions Trading Authority (DEHSt)
	Lead Executive Agency (where different from ETS Administrator)	Political oversight and coordination, executive rulemaking	German Ministry for the Environment, Nature Protection and Nuclear Safety (BMU)
	Other Executive Agencies	Offer guidance, support and scientific input on select issues	U.S. Commodity Futures Trading Commission (CFTC), Japanese Statistics Bureau, Netherlands Environmental Assessment Agency (PBL)
	Legislature	Adopt formal ETS legislation	European Council and Parliament, Mexican Congress
	Judiciary	Resolve conflicts and decide judicial disputes	German Bundesverwaltungsgericht (BVerwG), UK High Court
	International Organizations and Networks	Provide technical assistance, cooperation, and thought leadership	World Bank, International Carbon Action Partnership (ICAP)
	Delegated Support Entity	Support on delegated tasks	Western Climate Initiative, Inc. (WCI, Inc.), Regional Greenhouse Gas Initiative, Inc. (RGGI, Inc.)
PPP	Accredited Verifiers	Audit and verify emissions reports	Accredited accounting, auditing and certification firms
	Standardization Bodies	Develop and administer standards and guidance (e.g. for MRV, offset credits)	International Organization for Standardization (ISO), offset standard administrators
	Compliance Entities	Subject to compliance obligations	Utilities, industrial facilities
	Exchanges	Offer platform for trading of emission units and derivatives, sometimes also clearing and auctioning services	European Energy Exchange (EEX), Intercontinental Exchange (ICE)
	Brokers	Market making by facilitating transactions in emission units and derivatives, usually for non-standardized transactions and smaller volumes; aggregating transactions	Commodity trading firms, specialized dealers and brokers
Private	Banks	Lending and financing, hedging counterparty	Commercial banks, investment banks, credit unions
	Project Developers	Originate and develop offset crediting projects	Offset project owners, consultancies, specialist service providers
	Professional Services	Provide legal, accounting and other advisory services	Consultancies, law firms, accounting firms
	Analysts	Provide market intelligence, such as price and transaction data	Financial analysts, strategic research providers, market data aggregators
	Media	Report on policy and market developments	Print media, broadcast news, trade publications
	Interest Groups	Aggregate and articulate member interests	Trade associations, environmental NGOs
	Research and Academia	Participate in foundational research and education	Universities, think tanks

Tools. In general terms, an ETS draws on the same tools as other governance processes (see Chapter 2.3). Itself the outcome of a policy decision, an ETS is particularly reliant on a variety of formal and informal policy statements for its governance framework, including statutory legislation, administrative ordinances, and technical guidelines. The level of formality and pedigree of these policy documents will depend on the aims they set out and their relative importance, as well as the degree to which they intervene in individual or collective behavior (see also Chapter 4.1.2). Substantively, they can deploy a variety of measures to influence behavior, such as planning, suasion, prohibitions, obligations, authorizations, and sanctions (see Table 5).

Institutional structures also play an important role, such as the registry established to track the distribution and transfer of emission units, or a service desk operated by an ETS administrator to assist compliance entities. Finally, information can be an important tool in the governance of an ETS, with the nature of information collected or generated – for instance data on emissions or market activities, or independent assessments of market functioning – and the scope and timing of its disclosure all potentially influencing public perceptions and stakeholder behavior.

Processes. Processes likewise assume an important role in the governance of an ETS. Predictable, transparent, and inclusive processes can strengthen both the material quality of governance outcomes as well as their acceptance by affected stakeholders. As mentioned previously (see Chapter 2.3), distinguishing between tools and processes can be difficult at times. In an ETS, for instance, the compliance cycle (see Chapter 5.2) represents a process of successive steps across a specified period of time, yet it is set out by way of policy statements defining each step in the process – such as the monitoring or reporting obligations – which could, in turn, be classified as governance tools. Often, such processes are formally mandated by law, such as the administrative process required in many jurisdictions when adopting or amending administrative acts and ordinances, whereas others occur spontaneously in the exercise of administrative discretion or due to stakeholder initiative. Some processes occur only once or on occasion of major system changes, whereas others recur periodically throughout the existence of the ETS, including the processes relating to the distribution of emission units, the compliance cycle, or ETS performance review. Judicial or mediation proceedings, finally, can be triggered in the event of legal disputes, for instance about the terms of a transaction or objections against a decision by the ETS administrator.

Table 5: Examples of Policy Tools Used in an ETS

Type	Examples
Planning	Setting the emissions cap or intensity target
Suasion and Support	Providing compliance assistance to covered emitters
Prohibition	Prohibition on theft, fraud, tax evasion or money laundering
Obligation	Obligation to monitor and report emissions
	Obligation to surrender emission units
	Obligation to disclose market activity data
Authorization	Requirement of operating permit for emitting installations
	Requirement of securities license to trade in financial products
	Requirement of accreditation to verify emission reports
Sanction	Administrative penalty and public disclosure of offender for failure to comply
	Criminal sanction for theft, fraud, tax evasion or money laundering

3.3 Governing an ETS: The Phases of Emissions Trading

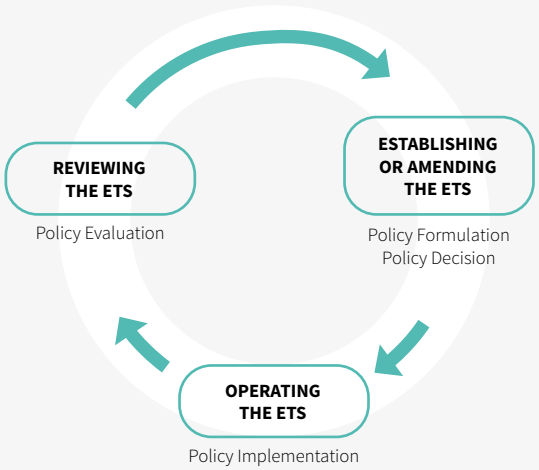
An ETS is not a static policy instrument: it is the product of an evolutionary process over time. Borrowing from the conceptual depiction of the policy cycle introduced in Chapter 2.3, this process can be broken down into three main phases:

- the initial establishment of the ETS;
- its routine operation;
- and its review and amendment.

To visualize how they relate to and influence each other, these phases in the evolution of an ETS can be correlated with the stages in the policy cycle (see Figure 4).

Applying this conceptual framework, the establishment of an ETS entails defining its objectives, identifying and evaluating alternative design options, and reaching a decision on its adoption. Some steps in the initial establishment, such as the elaboration of the legal framework and the creation of administrative structures, already contribute to policy implementation, which otherwise mostly consists of the continuous process of routine operation. Finally, performance review correlates with the policy evaluation stage, which in turn can result in modifications to the ETS, beginning the cycle over again.

Figure 4: Phases of Emissions Trading and the Policy Cycle



Each of these phases entails important governance functions, which are explored in greater detail and with reference to practical experiences in subsequent chapters of this report. During the establishment of an ETS, specifically, governance acquires relevance for the processes that precede introduction of the ETS as well as the architecture that sets out its design. Table 8 below lists governance functions and channels encountered during this inception phase, and distinguishes three separate contexts that will also inform the structure of deeper analysis in Chapter 4:

- the political and legal process;
- the institutional and regulatory framework of the ETS;
- and the technical and administrative capacities needed to establish the ETS.

Different actors, tools, and processes play a role in each of these governance contexts. For ease of reference, Table 6 (pg.27) also correlates the governance functions – on which this report focuses – to the design steps outlined in the PMR/ICAP Handbook “Emissions Trading in Practice: a Handbook on Design and Implementation” (PMR and ICAP 2021).

Once the ETS has been established, a new phase in its governance begins. This is the phase of routine operation, which, unlike the previous phase, is less concerned with setting up new structures than it is with exercising day-to-day administrative functions and applying and enforcing rules. Here, the main governance functions relate to:

- compliance oversight, including oversight of emissions reporting, collecting and managing emissions data, and performing accreditation and oversight of verifiers;
- market oversight, which includes determining market access and safeguards against market volatility and vulnerability to fraud;
- transparency, which includes disclosure of emissions data and information about market activities to stakeholders or the general public;
- and dispute resolution in the event of judicial proceedings or other conflicts.

Table 7 (pg.27) identifies these governance functions and gives examples of relevant actors, tools, and processes.

Table 6: Governance Functions during the Establishment of an ETS

Governance Context		Governance Function	Actors	Tools	Processes	Steps
Establishment	Political and Legal Process	Stakeholder Engagement and Consensus Building	Lead Executive Agency, ETS Administrator, Compliance Entities, Interest Groups	e.g. Stakeholder Mapping, Engagement and Communication Strategy	e.g. Public and Stakeholder Consultations, Working Groups	1
		Creating a Robust Legal Basis	Legislature, Lead Executive Agency	e.g. Legislation, Executive Rulemaking	e.g. Legislative or Rulemaking Procedures	0, 1, 2, 3
		Regulatory Impact Assessment	Lead Executive Agency	e.g. Data, Cost-Benefit Analysis, Economic Modelling	e.g. Public and Stakeholder Consultations, Workshops	0
	Institutional and Regulatory Framework	Defining Institutional Functions and Responsibilities	Legislature, Executive Agencies, ETS Administrator	e.g. Legislation, Executive Rulemaking, Guidelines	e.g. Legislative or Rulemaking Process, Interagency Coordination	0, 1, 4, 6, 9
		Deciding the Level of Formality and Centralization	Legislature, Executive Agencies	e.g. Legislation, Executive Rulemaking	e.g. Legislative or Rulemaking Process, Federal Coordination	0, 6
		Embedding in the Broader Legal Framework	Legislature, Executive Agencies, Judiciary	e.g. Legislation, Executive Rulemaking	e.g. Legislative or Rulemaking Process	6
	Technical and Administrative Capacity	Capacity Needs of Public Authorities	Executive Agencies, ETS Administrator, International Organizations and Networks, Analysts	e.g. Educational Material, Simulations, Guidelines	e.g. Training Courses, Seminars, Workshops	1
		Capacity Needs of Regulated Entities and Other Stakeholders	ETS Administrator, Compliance Entities, International Organizations and Networks, Interest Groups, Analysts, Media	e.g. Educational Material, Simulations, Guidelines	e.g. Training Courses, Seminars, Workshops	1

Table 6 also correlates the governance functions – on which this report focuses – to the design steps outlined in the PMR/ICAP Handbook "Emissions Trading in Practice: a Handbook on Design and Implementation" (PMR and ICAP 2021). Once the ETS has been established, a new phase in its governance begins.

Table 7: Governance Functions during the Operation of an ETS

Governance Context		Governance Function	Actors	Tools	Processes	Steps
Operation	Compliance Oversight	Oversight of the Compliance Cycle (MRV and Enforcement)	ETS Administrator, Accredited Verifiers, Compliance Entities	e.g. Reporting Guidelines, Accreditation Criteria, Penalties	e.g. Compliance Cycle, Accreditation Procedure	6
	Market Oversight	Oversight of Market Actors and Activities	ETS Administrator, other Executive Agencies, Compliance Entities, Market Intermediaries	e.g. Registry, Registration and Disclosure Obligations, Position Limits	e.g. Authentication Process, Harmonization of Financial Market Rules as well as Accounting and Taxation Rules	6
	Transparency	Disclosure of Emissions and Market Data, Information on Revenue Use	ETS Administrator, other Executive Agencies, Compliance Entities, Market Intermediaries	e.g. Emissions Inventory, Emitter Database, Central Limit Order Book	e.g. Reporting Cycles, Media Engagement	1, 6
	Conflict Resolution	Resolution of Judicial Disputes or Mediation	ETS Administrator, Judiciary, Professional Services	e.g. Judicial Rules of Procedure, Mediation	e.g. Hearings, Appeal Process	6

Table 7 identifies these governance functions and gives examples of relevant actors, tools, and processes.

Table 8: Governance during the Review of an ETS

Governance Context		Governance Function	Actors	Tools	Processes	Steps
Review	Performance Review	Assessing the Performance of the ETS and the Need for Modifications	Legislature, Lead Executive Agency, other Executive Agencies, ETS Administrator, Analysts	e.g. Economic Modeling, Qualitative Surveys	e.g. Evaluation Process, Stakeholder Engagement	9
	System Change	Managing Modifications to the ETS, including Linking and Termination	Legislature, Lead Executive Agency, ETS Administrator	e.g. Legislation, Executive Rulemaking, Notification	e.g. Legislative or Rulemaking Procedures, Consultations	8, 9

Table 8 lists governance functions and channels encountered during this inception phase, and distinguishes three separate contexts that will also inform the structure of deeper analysis in Chapter 4: the political and legal process; the institutional and regulatory framework of the ETS; and the technical and administrative capacities needed to establish the ETS.

Finally, as mentioned at the outset of this section, at certain points in its evolution, an ETS will face the need for a review of its performance and potentially for adjustment or modification. Such a review will often be mandated at periodic intervals in the legal framework of the ETS, for instance at the end of a compliance period.

It can also be discretionary, however, for instance in response to unforeseen developments such as an economic shock or the adoption of a more ambitious mitigation target. During such a review, the performance of an ETS will usually be evaluated against the objectives for which it was introduced in the first place, although these may also be revisited as part of the review process to reflect evolving fundamental and political circumstances.

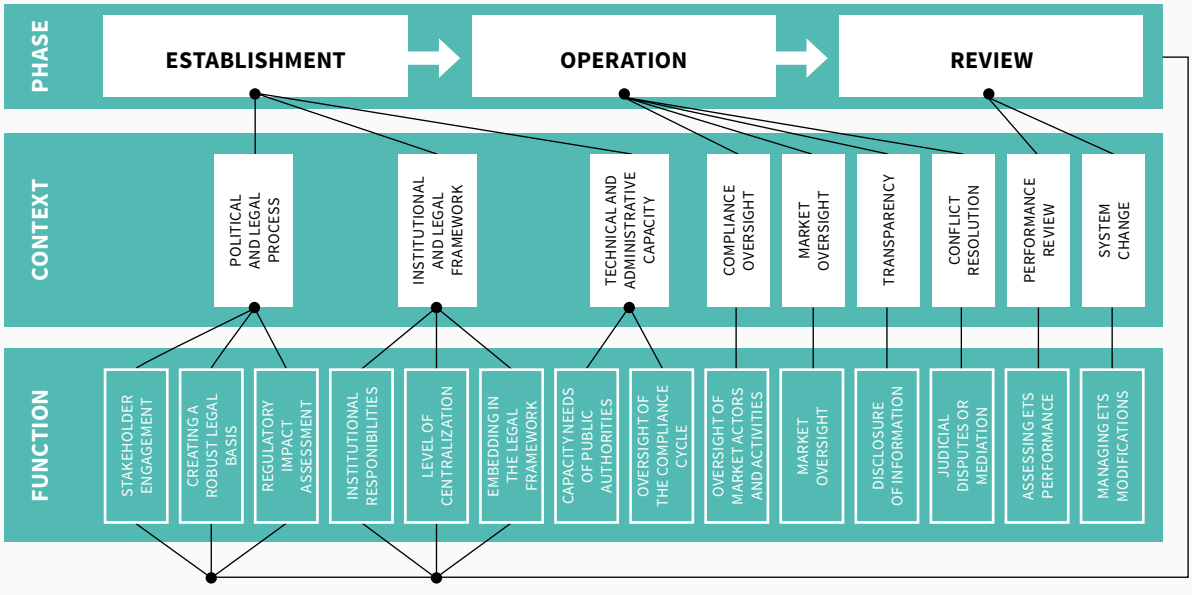
If the review culminates in a decision to modify the ETS, many of the processes already encountered during the initial establishment of the ETS acquire relevance again. Managing system change is, in other words, also an important function of governance, and ranges from minor design recalibrations to more fundamental adjustments, such as the expansion to new sectors and activities, the establishment of a link to another ETS, or, finally, the termination of an ETS.

3.4 Principles of Successful ETS Governance

No set of abstract principles can ensure successful governance of a policy instrument as complex and context sensitive as an ETS. Still, the principles outlined in the previous chapter (see Chapter 2.4) have shown a reliable correlation with improved governance outcomes and are likewise apparent in key design choices and implementation practices found in existing ETSs. That is not to say that these ETSs were necessarily designed and implemented to consciously internalize such principles. Rather, it serves as a reminder that the principles are themselves born out of a legacy of relevant experiences and observations in the exercise of public authority, which, in turn, justifies their consideration in the establishment, operation and review of an ETS.

For instance, given their technical complexity, ETSs have typically been preceded by extensive stakeholder engagement and capacity building activities, both to foster better understanding as well as to obtain feedback that may help improve system design.

Figure 5: Governance Phases, Contexts and Functions in an ETS



A sufficient level of transparency – in the form of available data on emissions or market activities – is vital for the efficient allocation of resources in the market through informed decisions. Accountability and the rule of law, in turn, are important for credibility of the system and confidence in the market. Ensuring fairness by considering the distributional consequences of emission unit allocation or revenue expenditure can be critical to sustain political support. Table 9 relates the governance principles introduced in Chapter 2.4 to the three phases of ETS design and implementation, and lists the governance context and functions on which they have a bearing. Again, an ETS will not succeed simply because its governance is faithful to these principles, nor will it necessarily fail just because these principles have not been consciously internalized. Due to their general nature, principles rarely dictate a specific outcome and will, in fact, sometimes contradict each other, for instance when transparency interests collide with vested rights of privacy or confidentiality that form part of the rule of law.

Overall, therefore, the value of principles primarily consists in offering guidance when the need arises, for instance, to balance alternative design options, exercise administrative discretion, or operationalize relevant procedures. As experience with emissions trading has shown, however, successful ETSs tend to reflect these principles in their governance practices, whether expressly or implicitly. How exactly they have done so will be described over the next three chapters, drawing on concrete examples for each governance context and function featured in Table 9 on the next page.

A sufficient level of transparency – in the form of available data on emissions or market activities – is vital for the efficient allocation of resources in the market through informed decisions.

Table 9: Principles of Successful ETS Governance

Governance Principle	Phase	Governance Context	Governance Function
Participation	Establishment	Political and Legal Process	Stakeholder Engagement and Consensus Building
	Review	Performance Review	Assessing the Performance of the ETS and the Need for Modifications
		System Change	Managing Modifications to the ETS, including Linking and Termination of the ETS
Transparency	Operation	Transparency	Disclosure of Emissions and Market Data, Information on Revenue Use
		Compliance Oversight	Oversight of the Compliance Cycle (MRV and Enforcement)
		Market Oversight	Oversight of Market Actors and Activities
Accountability	Operation	Compliance Oversight	Oversight of the Compliance Cycle (MRV and Enforcement)
		Market Oversight	Oversight of Market Actors and Activities
		Conflict Resolution	Resolving Judicial Disputes or Mediation
Rule of Law	Establishment	Political and Legal Process	Creating a Robust Legal Basis
		Institutional and Regulatory Framework	Defining Institutional Functions and Responsibilities
			Deciding the Level of Formality and Centralization
			Embedding in the Broader Legal Framework
	Operation	Conflict Resolution	Resolving Judicial Disputes or Mediation
	Review	System Change	Managing Modifications to the ETS, including Linking and Termination of the ETS
Effectiveness and Efficiency	Establishment	Political and Legal Process	Regulatory Impact Assessment (RIA)
		Technical and Administrative Capacity	Capacity Needs of Public Authorities
			Capacity Needs of Regulated Entities and Other Stakeholders
	Operation	Market Oversight	Oversight of Market Actors and Activities
	Review	Performance Review	Assessing the Performance of the ETS and the Need for Modifications
		System Change	Managing Modifications to the ETS, including Linking and Termination of the ETS
Equity and Fairness	Establishment	Political and Legal Process	RIA

04. First Phase: Establishing the ETS

Chapter 4 discusses governance requirements during the establishment of an ETS, encompassing both the processes that precede introduction of the ETS as well as the legal and administrative architecture that sets out its design. It breaks down the institutional, regulatory and procedural structures that need to be in place at the outset of an ETS and highlights the roles and responsibilities of relevant actors. To that end, Chapter 4 distinguishes three governance contexts encountered during this inception phase: the political and legal process preceding its establishment; the institutional and regulatory framework of the ETS; and the technical and administrative capacities needed to establish the ETS.

4.1 Political and Legal Process

The introduction of an ETS will usually be preceded by a political and legal process, in which the implementing jurisdiction considers options to achieve defined policy objectives and progresses through a series of procedural steps. In the conceptual framework of the policy cycle described earlier (see Chapter 2.3), these are the stages of problem identification and policy formulation that eventually culminate in a policy decision and its implementation. Because political processes and the actors and interests they involve are specific to a jurisdictional context, not all experiences and practices are easily transferable. Still, in general terms, some common features can be identified across jurisdictions.

Before reaching a decision about the establishment of an ETS, policy makers and stakeholders will seek to understand the options available for ETS design and implementation.

Before reaching a decision about the establishment of an ETS, policy makers and stakeholders will seek to understand the options available for ETS design and implementation. This process can be greatly enhanced through early engagement with stakeholders in the private sector and civil society, coupled with an active outreach and communications strategy (see Chapter 4.1.1). Once a jurisdiction decides to move forward and set up an ETS, it will typically require an existing or newly created legal basis empowering it to do so (see Chapter 4.1.2). Often, a detailed assessment of the environmental, economic, and social impacts will accompany this process (see Chapter 4.1.3). Each of these governance steps is described in greater detail below, along with case studies drawn from several existing ETSs.

4.1.1 Engaging Stakeholders and Building Consensus

Setting up an ETS involves making decisions about countless options for its design and implementation, and understanding the respective implications of alternative choices. While governments often possess extensive information – such as statistical data – to help inform these choices, they may not have the same understanding of a particular context as affected stakeholders. For instance, when it comes to estimating the abatement costs and opportunities in a specific sector, the emitters in that sector will often have more recent and more accurate information than the government. To correct such information asymmetries, governments can engage stakeholders and solicit views by way of different outreach activities.

Stakeholder engagement is not only important to obtain better technical and economic data, but it is also a means of building consensus, both among stakeholders and the general public, to secure broad acceptance of the ETS. This in turn improves its durability, and fosters sustained confidence in the resulting market. While emissions trading can reduce the economic cost of achieving a defined mitigation target, it may not always distribute the resultant burden in ways that are considered fair or politically acceptable. Successful governance of an ETS therefore tends to entail an open dialogue with affected constituencies, affording them an opportunity to voice concerns and develop a sense of ownership regarding the outcome. That said, policy makers have to balance consideration of stakeholder views and the need to ensure the impartiality and independence of their decisions. Stakeholders will often seek to influence policy choices in their favor, but such particular interests may not always align with the broader public interest in an effective ETS (Markussen and Svendsen 2005).

In practice, policy makers have a number of tools at their disposal to engage stakeholders and the general public. It can be helpful to develop a detailed engagement and communications strategy well in advance that specifies the format, timeline, and objectives of engagement, and that ensures clarity and consistency throughout the process (PMR and

ICAP 2021). Opinion surveys, focus groups, and other forms of market research can help map stakeholder positions, interests, and concerns related to emissions trading or specific design and implementation options (PMR and CPLC 2018). Often, rules of legislative and administrative procedure will require formal hearings, consultations, and other means of stakeholder involvement as part of the rulemaking process.

As the case studies in Box 1 below underscore, many jurisdictions have established institutionalized processes – such as working groups or standing committees – to facilitate continuous engagement with stakeholders in their ETS. Such continuity is important, as stakeholder engagement not only matters during the planning and initial design of an ETS, but should also persist throughout its implementation and operation. Costs incurred through such activities can be borne by the state budget, or they can be partially or entirely recovered from stakeholders through participation fees. Less formal activities, such as expert workshops, can help solicit feedback at specific points in the evolution of an ETS, such as a review of system performance and amendments to system design (see Chapter 6).

Box 1: Stakeholder Engagement in Existing ETSs

Existing ETSs offer valuable insights into how stakeholders can be engaged during the introduction of emissions trading and beyond. This box provides an overview of the approaches chosen in California, Québec, Germany, and Nova Scotia.

From 2008 to 2010, California and Québec, as partners of the Western Climate Initiative (WCI), discussed and adopted the framework and guidelines for the ETS they wanted to implement with a view to linking their respective systems in the future. All decisions were taken by consensus. In California, informal engagement with stakeholders was critical and proceeded in two parts. In 2007, California and other western States founded the WCI in a bid to address climate change at a regional level. The WCI policy process culminated in design recommendations for a multi-state GHG registry to track and manage emissions, and a market-based program to reach GHG emissions reduction targets. The WCI policy discussions and recommendations provided a critical venue to develop the framework for the ETS, build support, and educate key stakeholders including industry, government, academia, and the public.

Concurrent with the WCI process, California initiated informal engagement with stakeholders interested in developing a California ETS. This engagement took place from early 2008 through completion of the California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms Regulation (California Cap-and-Trade Regulation) in 2011. During this period, CARB conducted more than 40 workshops to solicit input and promote agreement on ETS design issues. CARB also constituted several advisory groups for this process, which included stakeholders from academia, government, NGOs, and business. These groups provided feedback on several areas of ETS design, including direct allocation of allowances versus auctioning of allowances, use of auction proceeds, assessing risks to market-based systems, and environmental justice issues. In 2009, the focus of workshops shifted to decisions on issues for which there were several potential options, such as auction design, trading rules, allocation, offsets, cost containment, how to address leakage, and market oversight. In 2011, as the draft Cap-and-Trade Regulation came close to being finalized, workshops reviewed specific proposals for regulatory text. Québec followed a very similar process with a slightly different timeframe. While the outreach and engagement processes took time, they afforded more interaction with stakeholders, and allowed government staff to understand stakeholder issues better, and to address specific concerns.

Similarly, Germany established a dedicated working group (Arbeitsgruppe Emissionshandel zur Bekämpfung des Treibhauseffektes, or AGE) in 2000, well in advance of the launch of the EU ETS in 2005. The decision to set up the AGE originated in the German federal government, which at the time recognized the need for new emission reduction policies and measures to meet obligations arising under the Kyoto Protocol. The AGE provided a space to discuss what the appropriate measures could be, and convened a broad range of stakeholders, including business associations, NGOs, and members of the legislature. Over 160 AGE meetings have taken place since it was launched, and all have been held under the 'Chatham House Rule', meaning that participants are free to use the information received, but neither the identity nor the affiliation of the speaker, nor that of any other participant, may be revealed. Deliberations are recorded – observing the Chatham House Rule – in the form of meeting proceedings. Members of the group must pay an annual fee to participate (although environmental NGOs are exempt), but fees only fund the AGE secretariat and cover the cost of meetings. The AGE is not meant to provide direct advice to regulators, but its deliberations inform, and therefore have an indirect impact on, ETS governance.

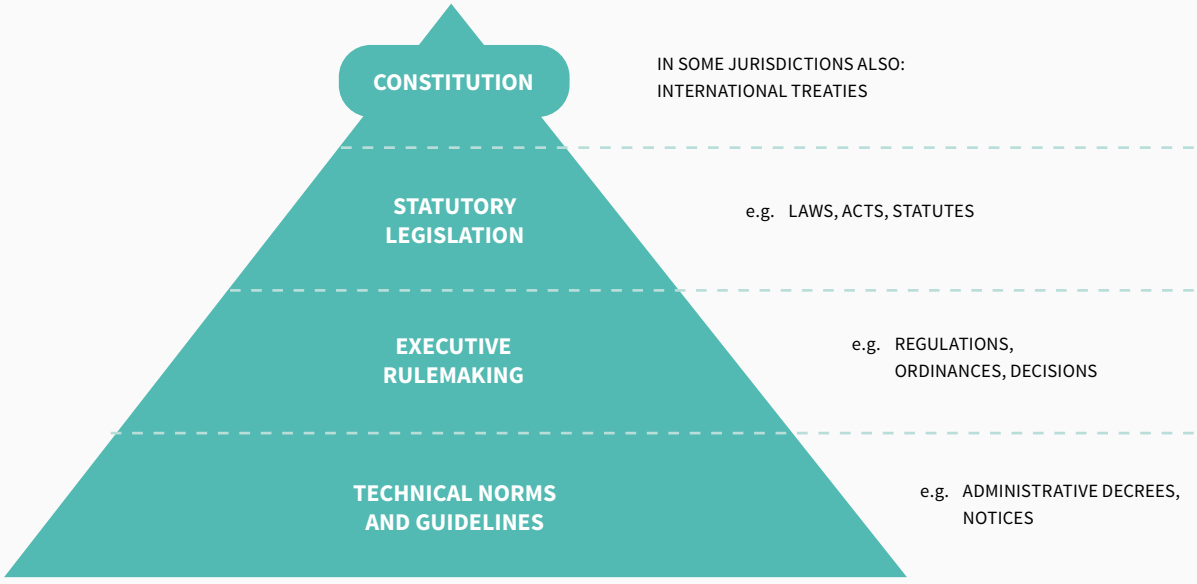
Finally, the province of Nova Scotia is small enough that stakeholder engagement in the inception of its ETS could be conducted directly with designated participants in the system, as well as other parties. The consultation process for its ETS, which has been in force since January 2019, involved a public consultation in March 2017, over 50 meetings with stakeholders (including two large group sessions), and the evaluation of written responses and online stakeholder submissions. A summary of feedback was released in a report in August 2017 (Nova Scotia 2017), which informed development of the program. Provincial regulators continue to have ongoing discussions with stakeholders even as the ETS is in force.

4.1.2 Adopting a Robust Legal Basis

A common starting point of any ETS is the legal basis that mandates its creation and sets out its central parameters. An ETS imposes significant constraints on the economic freedom of regulated entities, which is why its introduction will generally presuppose a formal mandate by a legislature or comparable body. This requirement for a formal legal basis is a manifestation of the rule of law, and vital for the subsequent exercise of public authority by the executive branch.[8] Central parameters of the ETS, such as the main rights and obligations of participants and core institutional functions, are therefore also often set out in formal legislation.

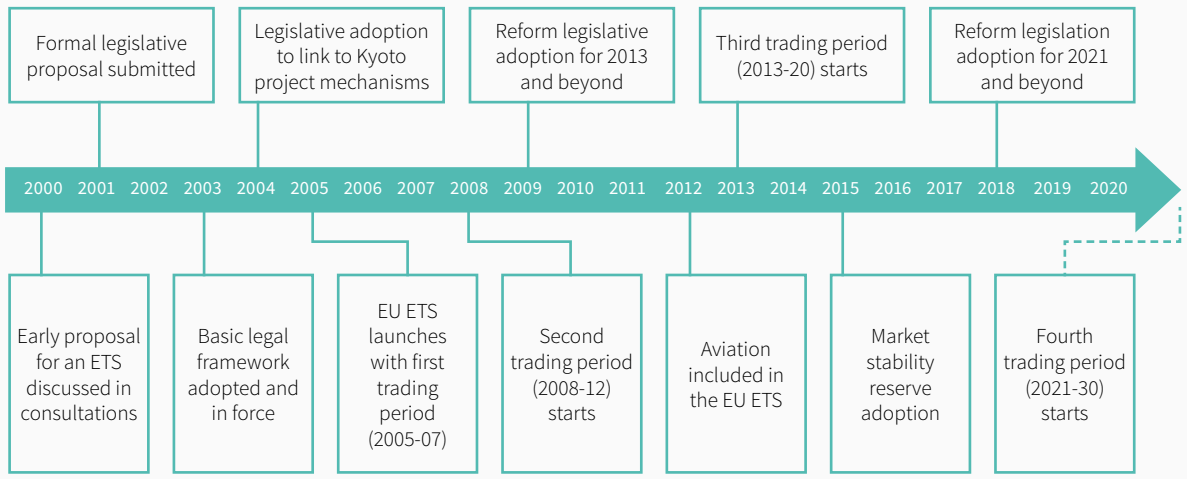
Aside from formally establishing the ETS, the legal basis also frequently operationalizes various elements of the ETS governance framework, such as rules and procedures related to the compliance cycle (see Chapter 5.2). From the moment a jurisdiction considers the establishment of an ETS, it will usually adhere to an ordained procedure governing the conditions to initiate relevant legislation or executive rulemaking, the actors involved, and the applicable timeline. That does not mean, however, that all operational details of an ETS need to – or indeed should – be set out in formal statutory law. On the contrary, legislators have to make a choice about the appropriate formality – or legal 'pedigree' – of different ETS design elements. One way to visualize the available options is the 'normative pyramid', in which different types of norms are hierarchically ranked by their degree of formality and normative pedigree, with higher-ranking norms superseding lower-ranking rules (see Figure 6). Where a norm is situated in this hierarchy will also entail different procedural requirements, with ramifications for the regulatory timeline and the extent of mandatory stakeholder involvement. That, in turn, affects the flexibility of such norms to adjust to changing circumstances, but also has implications for the perceived legitimacy and legal certainty they can afford to market participants and other stakeholders.

Figure 6: The Normative Pyramid[9]



(8) In some jurisdictions, the requirement is therefore called 'statutory reservation', meaning that any administrative action requires a formal legislative basis authorizing such action. (9) Note that terminologies vary across jurisdictions, in line with their unique legal traditions and convention.

Figure 7: Timeline of the Legal Basis for the EU ETS



Generally speaking, higher-ranking norms enjoy greater resilience against judicial review as well as amendment, suspension or annulment following political changes, but are also more cumbersome to adopt or adjust. In the context of an ETS, opting for a legal basis that is situated higher up in the normative pyramid, such as formal legislation, can strengthen the legitimacy and political durability of the ETS, but also tends to result in a slower and more cumbersome adoption or amendment process. Conversely, norms that are placed lower, such as executive rulemaking and technical norms, are relatively more vulnerable to political change and offer somewhat less stability and predictability than formal legislation, but offer the advantage of being easier to adopt and to amend.

Consequently, any decision about the formality or pedigree of the legal basis of an ETS involves navigating trade-offs and identifying the right balance between stability and legitimacy on the one hand, and ease of adoption and flexibility on the other. There is no general prescription that is equally valid in all situations: the appropriate balance will depend on the particular circumstances in a given context. Figure 7 shows a timeline of the initial adoption and subsequent reforms of the legal basis of the EU ETS, illustrating the often-extended periods of preparation and deliberation before formal legislation could enter into effect. That high level of formality has helped the EU ETS withstand a number of legal challenges, in large part because the legislative process that preceded its introduction and major reforms already necessitated building consensus across diverse interests and stakeholder constituencies to ensure passage. At the same time, the formality of the legal basis can also make it harder to react swiftly to system shocks, as exemplified by the long lead time of measures to address an allowance supply imbalance that began in the wake of the economic and financial crisis of 2009: nearly five years passed between that crisis and the adoption of legislation on the Market Stability Reserve (MSR) designed to address the allowance supply overhang.

Due to the political context of an ETS and its market fundamentals being in a state of constant flux, jurisdictions will routinely adopt certain elements of an ETS through norms that have a lower level of formality and legal pedigree. As mentioned earlier, the legal basis as well as central parameters of the ETS, such as its overarching objectives, general principles, and the main rights and duties of covered entities, are often regulated at a higher level in the normative hierarchy, while operational details that require frequent updating or primarily consist of technical guidance, such as benchmarks and detailed MRV rules, are commonly adopted by way of more flexible sub-statutory ordinances and decrees. To illustrate how this can manifest itself in practice, Table 10 provides an overview of the level of formality chosen for different parts of the legal basis of the EU ETS. Box 2 (next page) sets out several detailed examples of how different jurisdictions have approached the choice of a legal basis for their ETS. In the end, however, these examples serve illustrative purposes only: what approach will be most suited to a specific jurisdiction will depend on local legal and procedural constraints – as set out, for instance, in a constitution – as well as the prevailing regulatory practices and legal culture.

Table 10 provides an overview of the level of formality chosen for different parts of the legal basis of the EU ETS.

Table 10: Formality of Design Elements in the EU ETS

Design Feature	Norm	Formality
Legal Mandate	Directive 2003/87/EC, as amended by Directive 2018/410/EU	High
Scope and Coverage	Directive 2003/87/EC, as amended (Annexes)	High
Data Collection and Inventory Generation	Regulation (EU) 2018/1999	High
Nature and Stringency of Target	Directive 2003/87/EC, as amended Decision No 406/2009/EC; Regulation (EU) 2018/842	High Medium
Auctioning and Allocation of Units and Definition of Benchmarks	Commission Regulation (EU) No 1031/2010 Commission Regulation (EU) 2019/331 Commission Regulation (EU) 2019/1842 Guidance documents and tools	Medium Low
Price Management and Compliance Flexibility	Decision (EU) 2015/1814 Decision No 1359/2013/EU	Medium Medium
Registry	Commission Regulation (EU) No 389/2013	Medium
Monitoring, Reporting, Verification (MRV)	Commission Regulation (EU) 2018/2066 Commission Regulation (EU) No 2018/2067 Guidance documents and compliance tools	Medium Medium Low
Compliance and Enforcement	Directive 2003/87/EC, as amended Directive 2014/57/EU	High
Market Oversight and Regulation	Directive 2014/65/EU Regulation (EU) No 596/2014 Commission guidance on the application of VAT to emission allowances	High High Low

Box 2: Legal Bases of Emissions Trading in Existing ETSs

Although there is no one single approach to the adoption of a legal basis for an ETS, many of the systems currently in operation had their basis in amendments to existing climate or environment laws in the respective jurisdictions. In New Zealand, Kazakhstan, and Nova Scotia, for instance, the legislation enabling their ETS took the form of a legislative amendment – in the case of New Zealand an amendment to the comprehensive Climate Change Response Act that had been enacted six years earlier; in the case of Kazakhstan, through a modification to the Environment Code; and in the case of Nova Scotia, through changes to the Environment Act originally passed in the province in the 1990s. In other cases, such as the EU ETS and the California and Québec ETS, new legislation was adopted to enable the introduction of emissions trading as a policy option to achieve climate change mitigation targets. What follows below are more detailed descriptions of the legal bases of several ETSs at the supranational, national, and subnational level, including at the level of a city.

In the case of the EU ETS, adoption of a legal basis was complicated by the multilevel governance system of the EU, which is a supranational union of currently 27 sovereign countries. Responsibilities in the EU are distributed between the EU and its Member States, and the EU must have an explicit mandate to act at the supranational level before it can adopt any policy measures. Articles 191 to 193 of the Treaty on the Functioning of the European Union (TFEU) empower the EU to act on climate change, and a harmonized approach is considered necessary because of the transboundary nature of the challenge and its solution. Based on a legislative proposal first published in 2001, the EU ETS was created by way of formal legislation – a directive, defining objectives and measures, but leaving some discretion to Member States – in 2003 (European Union 2003). Any major changes to the EU ETS, such as extensions of its scope and coverage, have required an amendment to the original EU ETS Directive. An example is the fourth trading period (2021-30), which was defined by way of an amendment directive adopted in 2018.[10]

In Kazakhstan, the legal basis for the creation of the ETS and its implementation is the Environmental Code of the Republic of Kazakhstan (Kazakhstan 2007). The ETS was launched in 2011 through an amendment of the Environmental Code that added a new section.[11] After publication of this new section, which sets out the main provisions for the implementation of an ETS, regulations were developed to govern the ETS process. Between 2011 and 2020, the government issued four National Allocation Plans for GHG allowances, marking the trading periods of the ETS.[12] Because interest groups representing the private sector expressed concerns about the ETS, the legislature chose to improve the regulatory framework by adopting an amendment law that suspended the articles of the Environmental Code regulating GHG emissions until 1 January 2018.[13] Likewise, the National Allocation Plan for 2016-20 was suspended by Government Decree, although GHG emissions reporting requirements remained in effect.

Similarly, the legal basis for the New Zealand Emissions Trading Scheme (NZ ETS) is the Climate Change Response (Emissions Trading) Amendment Act of 2008. In early 2007, a group of representatives from a range of New Zealand government departments designed an ETS, and public consultations later that year demonstrated support for such a program. After further consultations and policy development, a bill to establish an ETS was introduced to New Zealand's unicameral parliament in December 2007. It followed the usual legislative process in New Zealand of being first considered and reported on by a parliamentary committee before going through final debates and passing a plenary vote in September 2008. Regulations then came into force to set the finer details of the ETS. Since its establishment, both the primary legislation and regulations have been updated.

As a state within the federal system of the United States, California retains legislative and executive powers in many areas of governance, including climate change. In 2006, California adopted the Global Warming Solutions Act (also known as 'Assembly Bill 32', or AB32), which sets out emission targets and a framework enabling the creation of a market-based approach to reducing GHG emissions. A formal rulemaking process yielded the regulatory changes that govern the ETS. It was, in turn, governed by the Administrative Procedure Act (APA) of the State of California, which required public review of proposed regulatory text, and provided opportunities for written and oral comments on proposals. In the case of emissions trading, the California Air Resources Board (CARB), the agency in charge of designing and implementing the program, was required to produce economic and environmental impact analyses as well as a staff report that explained the need for the regulation and the rationale for each part. A final staff report also provided a written agency response to all comments made during the formal process, and a vote by CARB was then required to determine whether to approve new regulations. CARB launched a formal rulemaking process in 2010, which culminated in the addition of a new set of provisions to the California Code of Regulations (California 2010).

Like California, Québec is a subnational jurisdiction which has the required powers – in this case under the Canadian constitution – to adopt and run an ETS. In 2009, the Québec National Assembly adopted a bill amending the province's Environmental Quality Act, which paved the way for the implementation of its ETS. In 2011, the Québec government adopted amendments to its Regulation Respecting Mandatory Reporting of Certain Emissions of Contaminants into the Atmosphere, mandating businesses and municipalities emitting more than 10,000 metric tons of CO2 annually to declare their GHG emissions. Also in 2011, Québec adopted a regulation setting out the operating parameters of the ETS, based on the WCI guidelines published in 2008 and 2010. All proposed regulatory amendments in Québec must go through a 60-day public consultation period. In 2012, the Québec regulation was amended again, in part to enable the link with the California ETS, which came into effect on 1 January 2014.

In Japan, regional governments likewise have the authority to enact local laws as long as these do not conflict with national law. The national Act on Promotion of Global Warming Countermeasures (Law No. 107 of 1998) explicitly provides that the national and local governments are responsible for the development and implementation of plans to reduce GHG emissions. Therefore, the Tokyo Metropolitan Government was able to implement its ETS through a local ordinance. First, however, the Tokyo Carbon Reduction Reporting Program, a mandatory reporting system that lays the foundation for emissions trading, was implemented through amendments to the Tokyo Metropolitan Environmental Security Ordinance (Tokyo 2000). As part of the Tokyo Climate Change Strategy adopted in 2007, the governor of Tokyo introduced a proposal to the Tokyo Metropolitan Assembly in 2008 that included mandatory targets for large emitters as part of an ETS. The assembly adopted the proposal unanimously and it entered into force in 2010, again as an amendment to the relevant ordinance.

(10) Directive (EU) 2018/410 of the Parliament and of the Council of 14 March 2018 amending Directive 2003/87/EC to Enhance Cost-effective Emission Reductions and Low-carbon Investments, and Decision (EU) 2015/1814. (11) Law of the Republic of Kazakhstan No. 505-IV of 3 December 2011, which introduced Chapter 9-1 on State Regulation in the Field of Emissions and Removals of Greenhouse Gases. (12) These were adopted as government decrees; for instance, the first National Allocation Plan was adopted by Decree of the Government of the Republic of Kazakhstan No. 1588 in December 2012. (13) Law of the Republic of Kazakhstan No. 491-V ZRK of 8 April 2016, On Amendments and Additions to Certain Legislative Acts of the Republic of Kazakhstan on Environmental Issues.

4.1.3 Conducting a Regulatory Impact Assessment (RIA)

Implementing policies through legislation or executive rulemaking will commonly have a number of consequences that are often difficult to anticipate without detailed study and consultation with affected parties. Regulatory impact assessment (RIA) – also sometimes referred to as regulatory impact analysis or review – denotes a systematic approach to the assessment of positive and negative effects of proposed or existing policies, including their ability to achieve intended outcomes. As a type of administrative procedure, this tool can draw on a diverse range of methods, and its sophistication and analytical breadth will vary depending on the issues at stake and the resources available (Radaelli and Francesco 2010). RIA is widely seen as an important part of an evidence-based approach to improving the quality of public policy decision making (Organisation for Economic Co-operation and Development (OECD) 2009).

Research suggests that use of an RIA within an appropriate framework can underpin the capacity of governments to ensure that policies are efficient and effective in complex and evolving contexts, such as climate policy. Accordingly, a growing number of jurisdictions have made an RIA mandatory prior to the adoption of new legislation or executive rulemaking, although the scope, content, role and influence of the RIA on policy making vary. Conducting an RIA is considered administratively and technically challenging, especially when it entails using cost-benefit analysis (CBA) to identify administrative burdens and basic compliance costs, or more complex types of costs and benefits, such as environmental benefits, distributional effects and impacts on competitiveness. It bears noting, however, that an RIA does not necessarily need to include a quantitative CBA: some jurisdictions place greater emphasis on qualitative indicators, including fairness considerations or structural transformation benefits that cannot be easily expressed in monetary terms.

Table 11: Steps in an RIA[14]

Steps	Description
Defining a regulatory problem	First, an RIA presupposed identifying the regulatory or policy problem. This step roughly coincides with the 'Problem Identification' stage in the policy cycle introduced earlier in this report (see Figure 3). Problems usually fall within three categories: market failure, regulatory inefficiencies, and new policy targets or objectives.
Identifying different regulatory options	During this step, the need for regulatory intervention identified in Phase 1 is translated into concrete policy options. This step roughly coincides with the 'Policy Formulation' stage in the policy cycle introduced earlier (see Figure 3).
Collecting data	This step is critical for an RIA, and can involve a variety of means that differ across jurisdictions and contexts. Relevant information for the RIA can be collected, for instance, through public consultations, interviews, questionnaires, online surveys, focus groups, and other channels.
Assessing alternative options	The central step of an RIA, which commonly involves a CBA, but can also be a cost-effectiveness analysis, a risk analysis, or some other approach to identifying the strengths and weaknesses of alternative options. Options assessed typically include a 'business-as-usual' scenario – in which the policy in question is not adopted – as the baseline.
Identifying preferred regulatory options	Once the available options have been identified and assessed (for instance by comparing their costs and benefits, or qualitative metrics for the expected positive and negative effects), the comparison of the different assessments will help identify a preferred option. This step roughly coincides with the 'Policy Decision' stage in the policy cycle introduced earlier (see Figure 3).
Communicating results of the RIA	Past experience suggests the value of publishing the RIA. Doing so allows further exchange with stakeholders and improves the general transparency of the process and its subsequent acceptance by regulated entities and the broader public.

(14) Source: Lemoine (2018).

Table 11 (page 38) describes the main steps in an RIA, and some of the approaches that each step can entail. For further details on how to conduct an RIA in the context of carbon pricing, see World Bank (2021a).

A practical example of an RIA is provided in Box 3, which describes the regulatory analysis preceding adoption of the U.S. Greenhouse Gas Reporting Program (GHGRP) that serves as the basis of GHG emissions reporting and verification for RGGI.

4.2 Institutional and Regulatory Framework

Once an ETS progresses beyond the initial planning stage, policy makers will be faced with the task of elaborating its institutional and regulatory framework. This framework is critical for the governance of an ETS, as it enshrines the design features of the ETS, defines the roles and responsibilities of key actors – including public authorities, compliance entities, and market participants – and sets out processes to ensure that the ETS can function properly across all phases of its evolution. As part of this important governance context, policy makers have to assign institutional functions and responsibilities (see Chapter 4.2.1), decide on the level of centralization in the administration of the ETS (see Chapter 4.2.2), and ensure that its regulatory architecture aligns with existing rules, principles, and doctrines in other areas of law (see Chapter 4.2.3).

4.2.1 Assigning Institutional Functions and Responsibilities

As described in Chapter 3.2, institutions play an important role in the establishment and subsequent operation of an ETS. In the broadest sense, institutions can be understood as structures or mechanisms of social order and cooperation that help govern individual

Box 3: Example of an RIA: The U.S. GHGRP

Faced with a Congressional mandate to elaborate a rule requiring "mandatory reporting of greenhouse gas emissions above appropriate thresholds", the United States Environmental Protection Agency (EPA) instructed its Climate Change Division in 2008 to initiate a rulemaking process on a federal Greenhouse Gas Reporting Program (GHGRP). Agency rulemaking in the United States is governed by the federal Administrative Procedure Act (APA) and a series of Executive Orders, which establish a process and guidelines for the elaboration of federal regulations. Under a tiered system to classify executive rulemaking based on its expected impacts on the economy, 'economically significant regulatory actions' that are likely to have particularly significant impacts require a centralized review, including an assessment and, to the extent possible, quantification of the benefits and costs anticipated from the regulatory action. Such rulemaking also requires the agency to conduct an assessment of alternative, 'potentially effective and reasonably feasible' regulatory approaches, and to demonstrate why the chosen approach is preferable. Given the expected cost of compliance for reporting entities, the GHGRP was classified as 'economically significant', thus requiring an RIA.

When the EPA issued its proposal for a rule, it accompanied that proposal with a draft RIA. Following the mandatory notice and comment period, the EPA published the final rule along with a revised RIA reflecting stakeholder comments and feedback from other government agencies. The RIA issued with the final rule establishing the GHGRP was a comprehensive document of 213 pages, in which it evaluated the costs associated with monitoring, recordkeeping, and reporting activities for each type of affected facility, as well as the relative costs of alternative design options. To do so, the EPA relied on existing data available at the agency, as well as data obtained from trade associations, states, and publicly available sources to characterize the processes, sources, sectors, facilities, and entities affected by the proposed rule. It also considered cost data submitted in public comments on the proposed rule. A detailed engineering analysis was then conducted for each source category to develop unique unit costs.

Assessing the GHGRP design options included in the final rule, the EPA estimated that 10,152 entities would be covered by the reporting obligation, facing USD 132 million overall in monitoring, recordkeeping, and reporting costs for the first year, and USD 82 million for subsequent years. The RIA also measured the economic impacts for covered sectors by comparing perentity costs with average per entity receipts, and concluded that the cost to sales ratios for reporting entities was uniformly under 0.8%. In addition to aggregate costs, the EPA also calculated the average private cost per unit of emissions reported, estimating that to be USD 0.02 per metric ton of CO_2e. Overall, therefore, the EPA determined that costs under the GHGRP would be widely dispersed throughout the economy, and that the rule would not have a significant economic impact on entities. This finding contributed to the GHGRP coming into effect in late 2009.

or collective behavior in pursuit of defined purposes. A common feature of institutions is their permanence; that is, their existence beyond the duration of a single decision or action. Institutions can be informal, such as cultural norms and habits, or formal, including government entities and other structures created intentionally with the purpose of governing. In this section, the focus will rest on formal government institutions and their role in ETS governance.

All three branches of government can exercise governance functions in an ETS, although the executive branch will usually play the greatest role in ETS governance. Relevant institutions include government agencies involved in the establishment, operation, and review of an ETS, such as ministries and technical or scientific agencies, as well as other formal mechanisms and structures that carry out specific tasks under an ETS, such as a registry established to track the distribution and transfer of emission units, or a service desk to assist compliance entities. Due to the influence of a wide variety of institutions on the governance of an ETS, it is important that their functions and responsibilities be defined in a clear and consistent manner, ensuring adequate coordination.

Depending on the jurisdictional context, such functions can be distributed across several institutions or concentrated in one institution that has overall responsibility for the administration of the ETS, the so-called 'ETS administrator'. Some jurisdictions differentiate more political tasks, such as overall coordination, stakeholder engagement, and rulemaking, from the routine administration of an ETS, and assign the former to agencies at the highest level of public authority, such as a national ministry. Technical and administrative tasks, meanwhile, may be delegated to subordinate bodies at the national, regional or local level (see Box 4 below). Other agencies, such as those mandated with overseeing financial and energy markets, may also exercise relevant governance functions.

Box 4: Role of the Lead Executive Agency and ETS Administrator

In New Zealand, the primary responsibility for the ETS rests with the Minister for Climate Change. Operational responsibilities for the ETS are defined in legislation and delegated to several government departments: the Environmental Protection Authority fulfills most general administrative and registry functions; the Ministry for Primary Industries manages ETS operations related to forestry and agriculture; and the Ministry for the Environment administers the Climate Change Response Act of 2002 and leads development of the ETS and overarching climate change policy in collaboration with other departments. Accordingly, no single entity has responsibility for all aspects of ETS administration. This distribution of responsibilities across government departments is confirmed in a Memorandum of Understanding and detailed in an NZ ETS Operations Manual.

Nova Scotia has assigned overall responsibility for its ETS to the Environment Ministry ('Nova Scotia Environment', or ECC), with support from the Department of Finance and Treasury Board and the Department of Energy and Mines. Day-to-day operations are administered by the Climate Change Division within ECC, and include administering the GHG emissions reporting program, managing participant registration and account set-up, running and monitoring auctions and reserve sales, and managing and reporting on the revenue generated from the program. ECC works with the Department of Finance and Treasury Board regarding the financial management and accounting of program revenue.

In California, the ETS is administered by one agency, the California Air Resources Board (CARB). There, the California ETS is managed by a branch of approximately 35 people, who are divided into four sections, each of which is responsible for a different aspect of the ETS: administering the auctions and running the compliance tracking system (registry), monitoring the market, allocating free allowances, and running the offsets program. Managers of each section report to a branch chief, who oversees the system as a whole. CARB also has a separate branch dedicated to annual GHG emissions data reporting and verification under the state's Mandatory GHG Reporting Regulation, and staff in this branch work closely with ETS staff. Information sharing between branches is limited to protect market-sensitive data and support the overall governance of the program. While CARB is responsible for the operation of the ETS, the California state legislature directs spending of funds associated with it, including the proceeds from the sale of emission allowances through quarterly allowance auctions.

In Québec, the Ministry of the Environment and the Fight against Climate Change administers the ETS. Its Carbon Market Division consists of a team of approximately 30 people, and is divided into four sections: operations, emitter outreach and follow-up, offset credits, and market supervision, strategies and development. As their programs are linked, the Québec and California teams are in constant communication to make their partnership work.

Not all governance functions in an ETS have to be exercised by the government itself. Depending on the jurisdictional context, an alternative approach can entail the delegation of relevant governance functions to a private entity, such as an existing or newly established corporation. Such public-private partnerships can help lower overall cost – especially if the delegated services are tendered in a competitive bidding process – and prove more nimble than a traditional government agency. Still, governments may hesitate to outsource politically or legally sensitive tasks, and may choose to retain control of the private entity, for instance through a majority stake in its ownership. Box 5 below describes experiences with the use of private entities in ETS governance.

Not all governance functions in an ETS have to be exercised by the government itself.

Box 5: Use of Private Entities in ETS Governance

Western Climate initiative, Inc. (WCI, Inc.) is a non-profit corporation created in 2007, which provides cost-effective technical and administrative solutions to support the participant governments. WCI, Inc. is not a political body, but a technical one, providing administrative services for ETSs. By coordinating support across jurisdictions, WCI, Inc. enables the market to be administered at a lower cost than would be possible with independent administration by each jurisdiction. It provides a continuous framework that can be expanded as more jurisdictions join. Each participating jurisdiction retains full policy control and oversight authority over its ETS, yet benefits from the following advantages, among others:

- WCI Inc. manages the joint compliance tracking system; administers joint allowance auctions; provides independent market monitoring and oversight services, and provides help desk services for participants;
- With stability and institutional memory being an important factor in multi-year policies such as an ETS, the fact that WCI, Inc. has low turnover and employees who can become specialized in specific functions has strengthened operations;
- Cost sharing from centralizing and outsourcing operations offers a large net savings compared to individual jurisdictions setting up and managing their own electronic tracking systems and auctioning platforms;
- WCI, Inc. also plays an administrative role in managing the system and facilitating coordination across teams, such as coordinating calls and dialogue with jurisdiction staff.

Also in 2007, a number of U.S. states in the Northeast and Mid-Atlantic created Regional Greenhouse Gas Initiative, Inc. (RGGI, Inc.), a non-profit corporation that supports development and implementation of the Regional Greenhouse Gas Initiative (RGGI). RGGI is a cooperative effort between currently 11 states – Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, Vermont, and Virginia – to reduce GHG emissions.[15] Among the advantages of having RGGI, Inc. managing the system are:

- Administrative efficiency of e.g. monitoring and housing the registry;
- Centralized communication function of convening and hosting multi-party meetings and calls related to the governance of the ETS;
- Economies of scale for functions that require a single approach to be followed by all participating jurisdictions, including auctions and allowance accounting.

Compliance and enforcement, however, are not entrusted to RGGI, Inc. Like WCI, Inc., it does not have policymaking authority and does not perform executive functions or make decisions on behalf of states.

Use of Public-Private Partnerships in the administration of ETSs can also be found outside of North America. In Kazakhstan, for instance, the Ministry of Ecology, Geology and Natural Resources – and, within the ministry, the Department for Climate Policy and Green Technologies – determines ETS policy, with a Committee for Environmental Regulation and Control which exercises compliance oversight. Still, a joint stock company (Zhasyl Damu, or 'Green Development'), which is fully controlled by the ministry, is the main body responsible for the implementation and maintenance of the ETS. In the EU ETS, meanwhile, Member States have entrusted the auctioning of emission units to a private exchange, the European Energy Exchange (EEX), which serves as a common auctioning platform subject to a Joint Procurement Agreement and, for Member States that have opted out of the common platform, subject to bilateral arrangements. Further, most systems, such as the Tokyo ETS, rely on independent third-party entities to verify the accuracy or emissions reporting. Usually, these entities have to be accredited by the ETS administrator or another public authority, documenting that they meet certain qualifications and observe certain procedural and organizational standards. In Tokyo, for instance, approximately 20 verification agencies meet the verification requirements set out in an official guideline formulated by the Tokyo Metropolitan Government.

(15) See https://www.rggi.org/rggi-inc/contact

4.2.2 Determining the Level of Centralization

Depending on the jurisdiction, the establishment of an ETS will also require a determination of the appropriate level of governance. In jurisdictions with a federal system of government or devolved responsibilities, policy makers have to decide which governance functions should be exercised at the central level, and which should be delegated to a subnational or local level. Similarly, where an ETS is being introduced through regional cooperation of several jurisdictions, governance functions will typically be distributed between a central level and the level of individual jurisdictions. Finding the right balance between centralized and decentralized governance can only occur for a specific context: a greater degree of centralization can help ensure more consistent application of the ETS, yet subnational or local authorities tend to be closer to compliance entities and stakeholders, and therefore often possess information and relationships that are unavailable at the central level. Box 6 below describes how this question has been addressed in different jurisdictions.

4.2.3 Embedding the ETS in the Existing Legal Framework

As an ETS is operationalized legally, it comes into existence within a densely populated context of existing rules and procedures across a variety of issue areas. Being an instrument of climate policy, the ETS will often be rooted in the administrative and regulatory system dedicated to environmental protection, and be able to build on that existing body of rules and institutions for its implementation, helping lower administrative cost and the need for new policy learning. In Europe, for instance, the EU ETS assimilated elements of the existing regulatory framework for integrated prevention and control of industrial emissions. In other jurisdictions, an ETS may build on established rules and procedures for the regulation of general economic activity, such as licensing or permitting requirements.

Whenever an ETS inherits legacy governance structures, however, these are likely to influence how it will operate, for instance by determining applicable doctrines, principles, and the rights and obligations of affected stakeholders. To avoid such path dependencies and better tailor ETS design and implementation to the specific context of GHG emissions mitigation, it can also make sense to create a separate legal and institutional framework. Whether the ETS thus builds on an existing field of regulation or is established through entirely new structures, regulators need to be aware of overlaps with other issue areas to ensure the best-possible alignment of the ETS with the broader regulatory context (Acworth et al. 2019). Not doing so can result in legal uncertainty and outright conflicts, which may, in turn, trigger judicial disputes (see Chapter 5.5).

An example of such regulatory overlap is the interaction between an ETS and energy markets. Where electricity prices are determined by a government decision rather than competitive markets, for instance, the price signal of an ETS cannot be passed through efficiently. In jurisdictions with regulated electricity markets, such as China (Baron et al. 2012), this has prompted an ETS design that accounts for the government role in electricity price determination by shifting the incidence of ETS compliance obligations from electricity generators to commercial and industrial electricity consumers (Munnings et al. 2016). As that example shows, an ETS can be designed to accommodate different energy market realities, but may not always be able to reverse the efficiency losses that can follow from planned or regulated energy markets (Acworth et al. 2020).

Another area of law with relevance for emissions trading is financial market regulation, which has a bearing on the oversight of the market for emission units and derivatives (see Chapter 5.3). Likewise, it is advisable to consider from the outset how emission units and ETS transactions will be treated under a number of legal and compliance regimes, from taxation and financial accounting rules to the law of property, contract, obligations, tort, and insolvency. Across jurisdictions, the definition of emission units has varied markedly, reflecting different legal traditions and regulatory contexts. Clarity on the legal nature and treatment of emission units and their purchase or sale can help avoid legal uncertainty, reduce transaction costs, and pre-empt loopholes that might undermine the integrity of the ETS and the market it engenders (see Box 7, pg.44).

Box 6: Level of Centralization in ETS Governance

Different considerations influence the division of responsibilities between centralized and decentralized governance actors across jurisdictions. In the case of the EU, a regional organization of economic integration with its own legal order, this division of responsibilities has evolved over time, with a trend towards centralization. In general, the EU has been given competence to act on matters in which there is added value to regulating the respective issues at the European rather than national level. Initially, the EU ETS was implemented in a decentralized way, with central decisions – such as allocation of allowances – delegated to the Member States. At the time, in the absence of MRV data, Member States were considered to have better information on aspects such as the installations in their territory, emissions data, and national policies in place. Over the years, however, it became widely accepted that centralization of certain design and implementation features was preferable. Such features included setting the cap and allocation of allowances to sectors, where comparable methodologies and levels of stringency were important to avoid competitive distortions in the single market and unnecessary administrative burdens. Registry functions have now been centralized with the Union Registry hosted by the European Commission, although national administrators share some registry functions. Likewise, auctioning of allowances has become largely centralized under a common auctioning platform, the EEX. Such centralization reflects the fact that the EU ETS is an EU-wide policy, and allows leveraging benefits related to economies-of-scale effects.

Still, despite the trend towards greater centralization under the EU ETS, many governance functions remain at the level of the Member States. Even there, however, questions about the appropriate level of centralization can arise. For instance, Germany is a federal republic and its constitution, in general, provides for legislation to be enforced by the federal states (Länder). When the EU ETS began in 2005, it was clear that a centralized approach was needed to ensure a level playing field and equal treatment of regulated entities across the country. The German Emissions Trading Authority (Deutsche Emissionshandelsstelle, or DEHSt), established as a division of the German Environment Agency (Umweltbundesamt, or UBA), was ultimately designated the national ETS administrator. In the beginning, matters such as allowance allocation decisions, emissions reporting, and sanctioning were decided at the central level by DEHSt. Other matters, such as defining the regulated entities through issuing the required emission permits and approving monitoring plans were delegated to the environmental authorities of the Länder. With the beginning of the third trading period, however, and as the system evolved, it became increasingly clear that more centralized decisions were needed for proper functioning of the system. Limited capacities at the level of the Länder, for instance with regard to monitoring plans, provided additional reasons to centralize functions. Not all aspects of ETS governance were centralized, however. The emission permit still forms a part of the permitting process required for e.g. industrial installation and combustion plants under the European Industrial Emissions Directive (IED), and has therefore been retained at the local level.

Similarly, Canada is organized as a federal system, although there, decisions on how to govern an ETS fall under the jurisdiction of those provinces that have introduced one. In 2016, the federal government announced the Pan-Canadian Framework on Clean Growth and Climate Change, which requires all provinces and territories to introduce a carbon price. To translate this framework into law, the Canadian Parliament subsequently enacted the Greenhouse Gas Pollution Pricing Act in 2018 (Canada 2018). Some provinces challenged the authority of the federal government to adopt a centralized framework but, in 2021, the Supreme Court of Canada affirmed the constitutionality of the national backstop approach, which is only triggered if a province fails to meet the minimum national standards (Supreme Court of Canada 2021).
One of the provinces, Nova Scotia, announced that it would develop and implement an ETS to meet the national carbon pricing requirement. Once a proposal for the ETS has been elaborated, the federal government determined that it complied with the minimum national standard. Nova Scotia chose to build its ETS upon past regulatory measures, such as a hard declining cap on GHG emissions from the electricity sector and an aggressive renewable energy standard. Given its small territory, it was also able to pursue a high level of engagement and communication with its stakeholders. Nova Scotia made the decision to use the existing national platform for GHG emissions reporting operated by Environment and Climate Change Canada, and an online registry and auction system run by WCI, Inc. (see above, Box 5). Many participants in Nova Scotia's ETS had already used these systems, and thus possessed the necessary capacities. When developing the regulations, the province was able to draw from existing regulations in Québec and Ontario, which had already established successful ETSs. This prior experience not only helped Nova Scotia to meet the tight timeline, but also to apply lessons learned from the other jurisdictions.

When separate jurisdictions link their ETSs to enable a more liquid market and to lower the overall cost of achieving mitigation objectives, they face a number of governance challenges related to the establishment and maintenance of that link (Santikarn et al. 2018). Coordination tasks that benefit from a centralized approach are often addressed through a joint agreement, such as the international treaty operationalizing the link between the EU ETS and the Swiss ETS, that sets out mutual obligations, relevant procedures, and also institutional structures in the form of a Joint Committee.[16]

Similarly, whenever emissions trading has an international dimension, the Paris Agreement – an international treaty with nearly universal participation – can become a relevant level of governance. Article 6 of the Paris Agreement allows its Parties to transact 'Internationally Transferred Mitigation Outcomes' (ITMOs), which, for instance, include transfers of emission units between internationally linked ETSs. While Parties retain substantial flexibility in how they operationalize ITMO transfers, decisions adopted by the Parties set out centralized guidance on how to reflect such transfers in periodic national reporting under the 'Enhanced Transparency Framework' (ETF) of the Paris Agreement and account for them when calculating progress towards national NDCs.[17] As with the allocation of responsibilities between national, subnational, and local jurisdictions, the centralization of governance requirements at the international level is generally motivated by a desire to ensure coordination and avoid a divergence of approaches.

(16) Agreement between the European Union and the Swiss Confederation of 23 November 2017 on the Linking of their Greenhouse Gas emissions Trading Systems. (17) See the Decisions of the Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC) serving as the Meeting of the Parties to the Paris Agreement (CMA) on Modalities, Procedures and Guidelines for the Transparency Framework for Action and Support Referred to in Article 13 of the Paris Agreement, adopted in Katowice in 2018, and Guidance on Cooperative Approaches Referred to in Article 6, Paragraph 2, of the Paris Agreement, adopted in Glasgow in 2021.

Box 7: Legal Nature of Emission Units

How emission units are defined and treated under the laws of the jurisdiction implementing an ETS has a number of important economic consequences for market participants. Such consequences include: whether the holders of emission units can acquire genuine ownership of units, along with the rights that convey with property, or only enjoy temporary possession; whether emission units are classified as financial instruments and thus fall within the remit of financial market rules; whether and when emission units are taxed, and on what basis; whether emission units can serve as collateral or security for a loan; and how emission units are treated in the case of insolvency of their holder. Regulators have not always anticipated these questions and possible outcomes, nor in every case chosen to adopt clear and consistent legal guidance (Anttonen, Mehling, and Upston-Hooper 2007). Hence, the definition and treatment of allowances has displayed significant heterogeneity across systems, often evolving over time and on a case-by-case basis through judicial or administrative decisions, the practice of relevant actors (such as tax accountants), and the recommendations of professional bodies such as the International Accounting Standards Board (IASB). Although progress has been made in harmonizing the legal definition and treatment of emission units, relevant work is still underway (ISDA 2021).

In California, for instance, an emission allowance is defined as "a limited tradable authorization to emit up to one metric ton of CO2e" and "does not constitute property or a property right" (California 2010).[18] In the statement of reasons for this provision, CARB declared that it "needs broad authority to limit or terminate the allowances to ensure that, in the event of any violations, fraud, or other malfeasance in the conduct of the allowance market, it can be immediately addressed" (California 2011). In the EU ETS, by contrast, some Member States treat allowances as intangible property, while others consider them administrative or 'sui generis' rights that afford their holders fewer privileges than full property.[19] Likewise, different jurisdictions apply different rules on how allowances are valued in the financial accounts of holders, with some requiring that they be valued at their purchase price and others at fair market value, substantially affecting the taxable basis when allowances are sold. Rules on capitalization and depreciation of allowances also vary considerably between jurisdictions. Such differences can result in legal uncertainty and higher costs for market participants, and may also increase the risk of abusive practices (European Court of Auditors 2015). For that reason, value-added taxation of allowances traded in the EU ETS, for instance, was eventually harmonized to prevent tax fraud, and since 2018 EU allowances are classified as financial instruments under financial market rules (see also Box 13).

4.3 Technical and Administrative Capacity

Governing an ETS – from its initial establishment through its routine operation and eventual review – is administratively complex, and requires a sufficiently high level of human, technical, and financial capacity. Capacity, like governance, is an opaque term with fluid boundaries. In its broadest sense, it can be defined as "the ability to perform functions, solve problems and set and achieve objectives" (Fukuda-Parr, Lopes, and Malik 2002). It serves as a measure for the infrastructure, knowledge, and human and financial resources that are required to prepare and implement decisions, although it has evolved to also include empowerment, social capital, and more generally the existence of an enabling environment.

This latter dimension acquires particular relevance in the context of climate governance: by virtue of its expansive scope and intersectional nature, climate change calls for cooperation among a large number of public and private institutions as well as individuals. It requires technical, financial, and human resources dedicated to climate issues in public administration, private business, as well as research and civil society organizations, but also depends on recognition of climate change in organizational and management structures as well as awareness across relevant agencies, stakeholders, and the general public (Willems and Baumert 2003). Again, like climate governance itself, the types and levels of capacity required are specific to their context.

In the context of economic instruments for climate change mitigation, these capacity needs are sometimes referred to as conditions of 'market readiness', meaning the "necessary technical, policy and institutional frameworks that a country and/or its entities" require to make market mechanisms such as an ETS operational (Aasrud, Baron, and Karousakis 2010). Compared to other market approaches, such as offset crediting on a project basis, an ETS requires a particularly high degree of government involvement. Public authorities with responsibility for the establishment and operation of the ETS need to possess the requisite capacity to identify and evaluate ETS design options, draft the regulatory framework,

(18) As the relevant provision goes on to state, an allowance and does not "limit the authority" of the state to "terminate or limit such authorisation to emit", see California (2010), Section 95820(c). (19) See, for instance, European Commission et al. (2019).

administer core ETS functions, and understand and manage the interactions of the ETS with other policies and administrative structures.

One assessment of capacity requirements for emissions trading has suggested grouping these in four different categories: institutional capacity, policy level capacity, capacity for data collection and management, and financial capacity (Clark, Gauthier, and Pinon 2010). Relevant capacities can also extend to less tangible, yet no less important, aspects such as familiarity with markets and how they operate, regulatory culture, and traditions of transparency and accountability in the exercise of public authority, where different geographies display substantial variation (Bell 2003; Goron and Cassisa 2016). Criteria for staff selection, for instance, should ideally be based on professional competence and technical merit, not on subjective considerations, such as personal relationships. Time, finally, is also a valuable resource, and avoiding an excessively rushed timeline for ETS design and implementation can affect the quality of its governance (Betz and Sato 2006).

Often, capacities will be unevenly distributed across the government, necessitating coordination between different agencies as well as the private sector and other stakeholders. This can favor the combination of responsibilities for ETS governance in a single government agency (see Box 4). Concentrating internal government capacity within one specialized entity, including through permanent civil service appointments, can be critical to the success and durability of an ETS, as it helps ensure institutional memory and resilience against changes in the political context and regulatory framework. It can also signal a commitment to ETS implementation and maintenance, instilling confidence in market participants. Because of the cyclical nature of ETS operation, however, with important administrative functions accumulating at specific periods of the calendar year (see Chapter 5.2), reliance on external entities for certain tasks can likewise be justified.

Ensuring adequate capacities for ETS governance extends beyond the public sector to other ETS stakeholders, notably to compliance entities. These have to be able to understand and perform their compliance obligations under the ETS, for which they need to develop capacity to monitor and report their emissions. But a functioning market will also depend on adequate capacities of other actors in ETS governance, for instance verifiers, who typically need to demonstrate requisite expertise to be accredited, or professional service providers and market analysts.

Understanding available capacities and potential gaps is therefore an important step in the establishment of an ETS.

Understanding available capacities and potential gaps is therefore an important step in the establishment of an ETS. Detailed capacity assessment studies can provide greater clarity, and often distinguish between capacities at the individual, organizational, and broader institutional level (Willems and Baumert 2003). Where such an assessment identifies capacity shortfalls, different means of capacity building – such as staff training, simulations, and guidance documents – can help foster the necessary technical skills, and jurisdictions introducing an ETS can draw on existing knowledge products and capacity building platforms (Hausotter and Mehling 2013).[20]

Jurisdictions assessing their capacity requirements will, at some point, also have to assess the financial resources needed to establish and operate an ETS. Although attempts have been made to estimate the cost of achieving market readiness under different scenarios (Vieweg et al. 2009), such estimates are by nature highly dependent on the particular context and relevant circumstances, such as the level of existing capacities, the design and scope of the ETS, and the number of compliance entities it will cover. Instead of offering highly aggregated cost estimates, Box 8 therefore offers concrete examples of how capacity requirements have been met in existing ETSs, and what institutional capacities – especially in terms of staff – have been established to operate these systems.

(20) At the multilateral level, such platforms are offered by the Partnership for Market Readiness (PMR) and the Partnership for Market Implementation (PMI) operated by the World Bank, as well as the International Carbon Action Partnership (ICAP), an international forum for governments and public authorities that have implemented or are planning to implement an ETS.

Box 8: Capacity Needs of Public Authorities in Existing ETSs

The case of Nova Scotia offers interesting insights into the capacities needed to develop and run an ETS. The early stages of Nova Scotia's ETS development required full-time government staff including an Executive Director, a Manager, and a Program Administrator. As the ETS transitioned to implementation, Nova Scotia Environment and Climate Change expanded its team to add specific roles and skillsets. The size of other early-stage ETS program teams will depend on the size of the ETS which the jurisdiction develops. The Nova Scotia ETS currently includes:

- Executive Director (1 FTE): provides leadership and direction for the ETS and also serves as a Director on the WCI, Inc. Board of Directors (see Box 5);
- Manager (1 FTE): oversees the implementation of the ETS, including managing staff and providing strategic direction for policy decisions;
- Engineer (1 FTE): manages the implementation of the GHG reporting program and is responsible for the annual Summary of Greenhouse Gas Emissions Report;
- Green Fund Coordinator (1 FTE): works closely with other government departments and stakeholders to coordinate and report on spending of revenue generated from the ETS. Also is responsible for publishing the Public Proceeds Report;
- Carbon Market Analyst (1 FTE): monitors trades, administers auctions and reserve sales, ensures that the market is effectively functioning, and identifies and reports any concerns (such as manipulation or fraud). Also is responsible for publishing auction reports;
- Policy and Program staff (4 FTE): monitors and implements policy to ensure the program operates as intended, registers participants, sets up accounts, provides training to participants, and participates in the administration of the WCI, Inc. technical discussions for the online registry and auction systems.

While Nova Scotia is able to run its subnational ETS with a relatively limited number of staff, large systems – such as the EU ETS – have placed greater demands on the administrative capacities in implementing Member States. In Germany, for instance, the German Emissions Trading Authority DEHSt (see Box 6) started in 2004 with a staff size of around 20, growing to 50 by the time trading began under the EU ETS in 2005. As the EU ETS expanded in scope during subsequent trading periods and DEHSt was mandated with additional responsibilities, its staff increased further and now counts around 200 employees.

Unlike some other Member State authorities, DEHSt opted not to rely heavily on external resources, such as consultants or a private entity, to administer elements of the system. While this could have lowered the required number of staff, it would also have raised new challenges, for instance around collection and processing of confidential data.

Still, the large staff of DEHSt relative to, for instance, the ETS program staff in Nova Scotia also has to be seen in context: not only does Germany have the largest number of covered entities under the EU ETS, with over 1800 installations under its jurisdiction, but the agency has also managed several functions beyond implementing the EU ETS: serving as the Designated National Authority (DNA) for the Clean Development Mechanism (CDM) and the Designated Focal Point (DFP) for Joint Implementation (JI) activities under the Kyoto Protocol, sponsoring and overseeing research and analysis, and administering the recently introduced national ETS for fuels. Capacity building has been an important factor in ensuring that the system is governed well, and from the outset DEHSt has pursued capacity building and training activities for its own staff, as well as for staff of local authorities tasked with implementation functions.

DEHSt opted not to rely heavily on external resources, such as consultants or a private entity, to administer elements of the system.

05. Second Phase: Operating the ETS

Chapter 5 provides a more detailed description of the elements of routine ETS operation and the associated governance needs, including oversight of the compliance cycle, administration of offset crediting, market oversight, transparency with regard to emissions and market data, and dispute resolution.

5.1 Governing the Routine Operation of an ETS

Once the ETS has been set up, a new phase in the governance of the system begins. This is the phase of routine operation, which, unlike the previous phase, is less concerned with setting up new legal and institutional structures than it is with exercising ongoing governance functions and applying and enforcing rules. Governing routine operations in an ETS includes ongoing management of key features of the ETS, such as issuing operating licenses or permits; overseeing the compliance cycle, including monitoring of emissions reporting, collecting and managing emissions data, and performing accreditation and oversight of verifiers (see Chapter 5.2); as well as enforcing any incidents of non-compliance, including through judicial means where necessary (see Chapter 5.5).

Additional institutional functions include maintenance of the registry and its account operations, such as account opening or closure; administering emission units from initial issuance of allowances through free allocation or auctioning – each of which requires performance of separate procedures, such as notification and carrying out of auctions, or defining and updating benchmarks – to emission unit banking, borrowing, surrender or cancellation; assessment and approval of offset projects, and issuance of offset credits (see Chapter 5.2 and Box 10 below); and operating mechanisms for supply or price management. Relevant tasks also include the collection of revenue through fees for administrative services, such as opening of registry accounts, and auctioning of allowances, as well as the expenditure of such revenue for eligible purposes.

An important function of the ETS administrator, furthermore, consists in the evaluation and disclosure of data it has collected on emissions and compliance entities. This function can range from contributing to national and international emissions reporting, to publishing the names of compliance entities which are in violation of their compliance obligations. Data thus disclosed can be highly sensitive, potentially affecting demand and prices in the market as well as the privacy or confidentiality rights of different market participants. How and when such data are made available to market participants and other stakeholders, such as analysts, the media, and the broader public, needs to therefore be prudently managed, and the rights and interests affected by the disclosure of such data need to be carefully balanced with the interest in ETS transparency (see Chapter 5.4).

Finally, routine management of ETS operations also includes overseeing activities in the market for emission units (see Chapter 5.3), which will typically be a task performed by a different entity than the ETS administrator, often falling within the purview of the financial market administrator; such market oversight also extends to supervision of market participants, such as brokers or exchanges; collecting and disclosing market data, again balancing potentially affected interests of market participants with the broader interest in market transparency; and facilitating market transactions. Although not all the foregoing aspects of ETS operation can be described in the following sections, those with particular relevance for ETS governance are described with ample references to practical examples drawn from existing systems around the world.

5.2 Overseeing the Compliance Cycle

In order to secure achievement of the primary objective of an ETS – reducing GHG emissions – it must be governed by a rigorous system of emissions transparency as well as provisions to secure compliance. Emissions transparency is ensured by way of monitoring, reporting, and verification (MRV), which together provide an important means of tracking the progress of individual market participants toward achievement of their defined mitigation objectives, establishing historical emission baselines for the allocation of allowances, and recognizing emission reductions through offset projects (see Box 10). Importantly, a credible MRV framework can also strengthen confidence in the ETS, fostering stronger market participation (Haites and Bird 2002).

In the context of an ETS, monitoring refers to the observation and determination of GHG emissions and compliance with emission mitigation obligations, be it through on-site and remote monitoring, or through use of inferences and indirect indicators. GHG emission inventories, for instance, are generally

calculated on the basis of direct and indirect activity data, such as the amount of fuel and electricity used as well as industrial output, in combination with individually determined or default calculation factors, such as emissions, combustion, and oxidation factors. Some systems differentiate the required methods by emissions volume or production output, with different tiers of accuracy and data quality required for emissions monitoring (PMR and ICAP 2021).

Reporting, by contrast, requires communication of information obtained through monitoring, with a view to facilitating the assessment of the ETS and the individual performance of covered compliance entities. Information to be reported may include emissions data, activity levels, and technology investments. Usefulness of reporting generally depends on the precision and reliability of reported information, and the degree to which information is presented in a transparent and standardized way so as to allow for comparisons between reports and verification by others.

Finally, verification refers to a process through which the accuracy and reliability of reported information or the procedures used to generate information are assessed (PMR 2019). Verification can play a preliminary role in compliance procedures by providing the factual basis for subsequent legal determinations. Unlike reporting, verification cannot be performed by the regulated entity itself. In many ETSs, this task is performed by independent verifiers, which are private entities – typically accounting and auditing companies – that meet specified criteria in order to become accredited.

How these independent verifiers are selected and remunerated for their services – whether, for instance, this is left to the compliance entities or is carried out by the ETS administrator, with randomized assignment and subsequent cost recovery from compliance entities – can affect their impartiality (Shen et al. 2020). In most ETSs, public authorities carry out plausibility or random checks, but otherwise rely on the work of verifiers. Not all jurisdictions delegate verification to private entities, however, with some opting to retain full supervision of MRV reports, for instance by the ETS administrator.

Although governance frameworks for MRV differ across jurisdictions, they tend to rely on a set of common principles and procedures. One reason for these similarities are their common origins in guidelines and standards defined by international bodies such as the IPCC and ISO, which have

Box 9: The Compliance Cycle in the EU ETS

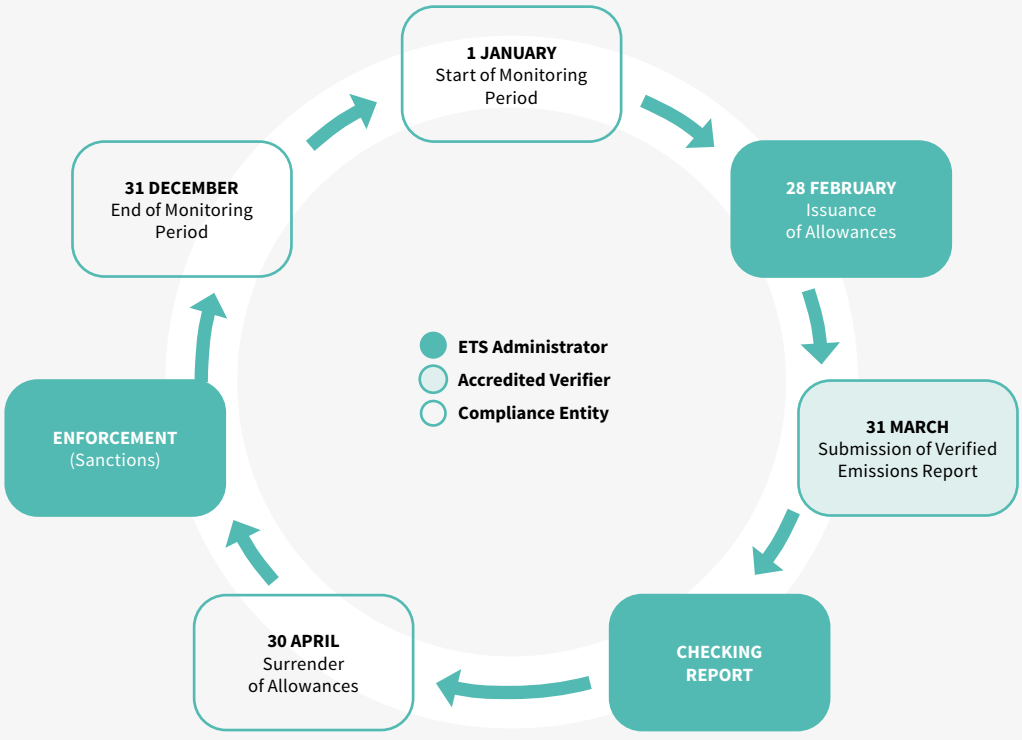
Under the EU ETS, covered installations measure and report emissions in accordance with an implementing act of the Commission, the Monitoring and Reporting Regulation (MRR, European Commission 2018a), and a series of supporting guidance documents. For each installation covered by the EU ETS, operators are initially required to submit a monitoring plan that sets out the methodologies used to calculate emissions. Approval of the plan is not a discretionary decision, but has to be given if the monitoring plan meets the requirements of the MRR, including its principles of completeness, consistency, comparability, accuracy, and integrity of monitoring and reporting. Operators have some discretion to choose between alternative monitoring methodologies, such as calculation- and measurement-based methodologies, or combinations thereof. Still, based on the annual emissions of each installation, different accuracy requirements – or 'tiers' – apply; installations that exceed specified emission thresholds are required to achieve a higher level of accuracy. If producers can demonstrate that observance of a tier incurs unreasonable costs, however, the competent authority can allow a less accurate monitoring approach.

Once the monitoring plan is approved by the competent national authority, operators are required to compile emissions in an annual emission report, applying the methodology contained in the monitoring plan. Relevant information in the report includes annual activity data, such as fuel input and raw material throughput data; calculation values, such as net calorific heat values and emission, conversion, and oxidation factors; and laboratory analyses and sampling results. Prior to submission, annual emission reports have to be audited – often including a site visit – by an independent verifier accredited pursuant to the Accreditation and Verification Regulation (AVR, European Commission 2018b). Accreditation requires periodic attestation by a national accreditation body that a verifier meets the requirements set by the AVR and harmonized verification standards, such as ISO 14065, and is subject to ongoing surveillance. After submission of the verified report, the competent national authority can perform spot checks and inspections, and – if it detects misstatements or non-conformities – take different facilitative and enforcement measures.

become templates or points of reference for national and subnational MRV systems. International and regional cooperation on MRV frameworks continues through bodies such as the EU ETS Compliance Forum, which offers a platform for information sharing and learning. Directly or indirectly, such initiatives contribute to coordination and harmonization of MRV standards.

In most ETSs, an enforcement system with appropriate penalties provides assurance that emissions reporting requirements as well as other compliance obligations are observed. Penalties can consist of a reputational deterrent – 'naming and shaming' – under which the names of noncompliant entities are published, financial penalties such as a monetary fine, requirements to 'make good' any compliance shortfalls, and further sanctions, including criminal charges for serious breaches of relevant obligations. Procedural and material requirements can delay enforcement actions, however, for instance when their addressee files an administrative or judicial appeal. Such delays are not uncommon, and are a manifestation of the rule of law (see also Chapter 5.5). Taken together, the foregoing procedural steps and obligations are often described as the 'compliance cycle' of an ETS. Box 9 and Figure 8 below describe the compliance cycle as it is applied in the EU ETS. Experience has shown that even the most robust MRV and enforcement framework cannot ensure full compliance, however. Increasing the rate of adherence with the processes and rules of an ETS also depends on the design of the governance framework itself, favoring a smart approach that creates few opportunities to evade, obfuscate, or ignore mandatory requirements (Giles 2013; Hindin and Silberman 2016). Research on regulatory designs that strengthen compliance has yielded useful insights that can also be applied to climate policy and the

Figure 8: The Compliance Cycle in the EU ETS



governance of an ETS (Giles 2021).
A similar compliance cycle also applies to offset crediting, the process of issuing emission units – or "offsets" – to entities implementing approved mitigation activities (PMR and ICAP 2021). Many ETSs afford compliance entities flexibility to cover emissions with offset credits instead of allowances, extending a price signal and carbon finance to sectors or activities beyond those covered by the ETS, unlocking additional abatement opportunities, and helping reduce overall compliance cost. Such use is commonly subject to a number of conditions, however, observance of which is a critical condition for sustained confidence in – and demand for – offset credits.[21] Box 10 below identifies some common features in the governance of offset crediting systems.

5.3 Overseeing the Market for Emission Units

Provided the environmental integrity of an ETS is ensured through robust compliance oversight, subsequent operation of the carbon market may seem of secondary importance. Yet efficient and secure market operation is important to ensure that emission reductions are met at the lowest available cost. Abatement cost, in turn, has a direct influence on the definition of economically viable levels of mitigation. Accordingly, maintaining market functionality is a priority in its own right, yet it is once again subject to a number of challenges. Different practices can disrupt the market and impair its efficiency as an allocative mechanism. Some of these may be permissible, but pose risks, such as excessive speculation, whereas others represent forbidden practices, such as market manipulation, theft, fraud, tax evasion, and money laundering. Market oversight refers to the governance framework aimed at preventing or managing such practices.

As outlined earlier, some particularities of an ETS can render it more susceptible to interference and criminal activities than conventional markets, compromising its ability to incentivize investment and reveal low-cost abatement opportunities. Unlike traditional

Box 10: Governance of Offset Crediting Systems

Because offset credits enable compliance entities to compensate for emissions and embody an economic value, it is essential that they represent real, permanent, and additional emissions reductions. Ensuring the integrity of offset crediting therefore hinges on robust rules and procedures to govern the registration of mitigation activities, the issuance of credits, accounting for their transfer and use, as well as instituting liability for the quantity and quality of transacted credits, for instance if a reversal of credited emission reductions occurs (PMR and ICAP 2021). Similar to an ETS, an offset crediting system requires a governance framework that guides the three phases of initial establishment, subsequent operation and review of the system.

Establishing an offset crediting system entails defining eligible sectors, technologies, and types of activities that may be credited, as well as developing or approving suitable methodologies, accreditation rules for independent auditors, and technical guidelines for developers of mitigation activities. Ongoing implementation and oversight functions, in turn, include the approval and registration of eligible mitigation activities, certification and issuance of offset credits, maintenance of a registry for offset credits, accreditation of auditors, review of implementation decisions, as well as administration of grievances and appeals. Periodically, methodologies and technical guidelines as well as overall system operation need to be reviewed – for instance to evaluate the sectoral and geographical distribution of mitigation activities, or the transaction costs faced by developers – in order to identify and rectify any shortfalls (PMR 2021).

Governance frameworks for offset crediting currently exist at the domestic and international level, can be vested in public as well as private standards, and can serve mandatory or voluntary carbon markets. At the international level, for instance, Article 6 of the Paris Agreement establishes a "mechanism to contribute to the mitigation of greenhouse gas emissions and support sustainable development" which allows crediting of mitigation activities subject to the rules, modalities and procedures adopted by parties to the Paris Agreement and overseen by a Supervisory Body.[22] Also at the international level, and specifically for the sector of international aviation, the International Civil Aviation Organization (ICAO) has introduced CORSIA, which enables international civil aviation to achieve carbon neutral growth from 2020 through use of offset credits – labelled "Eligible Emissions Units" – from several approved offset crediting systems.[23] At the domestic level, meanwhile, California has established a "Compliance Offset Program", which allows entities covered by the state's ETS to satisfy a share of their obligations with offset credits issued by CARB for mitigation activities listed with one of several approved Offset Project Registries (OPR), which are private entities that administer offset crediting standards and provide offset project registration, verification, and other related services.

(21) Demand for offset credits, for instance, has been shown to depend on the legitimacy of the governing institution that issues the credits, see Bernstein (2011). (22) See Decision of the Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC) serving as the Meeting of the Parties to the Paris Agreement (CMA) on Rules, Modalities and Procedures for the Mechanism established by Article 6, paragraph 4, of the Paris Agreement, adopted in Glasgow in 2021. (23) ICAO, Resolution A39-3: Consolidated Statement of Continuing ICAO Policies and Practices related to Environmental Protection – Global Market-based Measure (MBM) Scheme, 27 September to 7 October 2016.

commodities that require physical delivery, emission units are intangible, instantly tradable, and subject to an artificially constrained supply of allowances and credits, which can make it easier for one or more market participants to influence trading activity. When trading systems allow banking, moreover, the absence of any storage cost for allowances or credits makes it viable to accumulate large positions for sale at a later date (Monast, Anda, and Profeta 2009). Market participants looking to act in bad faith can exploit information asymmetries, loopholes in the regulatory framework and gaps in market oversight – for instance where administrative responsibilities are distributed across multiple agencies or jurisdictions – to their advantage.

These vulnerabilities of emissions trading have called attention to the need for robust market oversight. Some market practices are merely considered risky or otherwise undesirable, and therefore discouraged with the threat of administrative fines or regulatory consequences, such as the loss of an operating license. An example of undesirable practices is strategic market behavior by dominant players, for instance when large volumes of carbon units become concentrated in the hands of a small group of market participants, vesting them with considerable market power (Hahn 1984; Hintermann 2017). Variations of market power include price manipulation through aggressive purchasing on a market with low liquidity, or achievement of defined threshold, or 'trigger', prices to activate certain regulatory consequences, such as relaxed constraints on borrowing and offset use, or execution of strategic reserve auctions (Whitesell and Davis 2008). Even manipulation across different markets is conceivable, given that, for instance, developments in the carbon market can affect prices in energy markets (Chan 2009).

While these activities are considered detrimental to efficient market operation and may undermine confidence in the market, other activities are considered so egregious or harmful that they are punished as criminal offenses, with sanctions ranging from severe financial penalties to community service or even imprisonment. Criminal offenses include various types of fraud and theft, such as intentionally false or misleading claims related to the ETS compliance cycle and market transactions; cybercrimes, including hacking and phishing; and financial crimes, such as money laundering, securities fraud,[24] and tax fraud[25] (Interpol 2013). Because such offenses trigger criminal proceedings, their prosecution involves a different set of actors than more routine aspects of ETS governance and follows a separate dynamic. Box 13 provides specific examples of how ETS governance can help limit fraud and other criminal activities, but first this section will describe the primary channels of ETS market oversight.

When establishing a governance framework for ETS market oversight, policy makers have a number of governance levers at their disposal, from regulating what is traded in the carbon market and how it is traded, to who can participate in the market. For instance, over-the-counter (OTC) transactions between market participants are considered more susceptible to harmful market practices because they occur on the basis of bilateral bargaining and usually without public disclosure of the price. Hence, some programs have mandated that trading take place on regulated exchanges, where transactions tend to be standardized and market activity is generally more transparent. Market participation can also be subjected to a number of additional conditions, such as:

- clearing and margin requirements to lower counterparty risk;
- holding and position limits implemented at the level of the registry, a central clearinghouse or an exchange to counteract abuse of market power;
- reporting and disclosure requirements – for instance by creating a Central Limit Order Book (CLOB) showing outstanding limit orders – to improve transparency in the market (see also Box 13 and Chapter 5.4 below for examples and details).

In addition to specifying the modalities of trading, market oversight can entail restrictions on the types of units transacted in the market. While all ETSs are premised on the ability to transfer emission allowances, not all markets allow transactions in

(24) Securities fraud can take the shape of e.g. collusion, insider trading, and 'wash trades', in which a market participant, acting through agents, is itself both the beneficial buyer and seller of the instrument, pushing prices higher to eventually conduct a large genuine sale. (25) See Box 13 below for examples of tax fraud in the operation of emissions trading.

offset credits and another type of tradable asset: carbon derivatives. Carbon derivatives are financial products embodying promises to deliver emission allowances or credits in a certain quantity, at a certain price, by a specified date, and they make up a majority of transactions in some existing systems. Box 11 below provides a more detailed discussion of different market segments and the types of units and financial products traded in the carbon market.

While theoretically increasing liquidity and helping allocate risk, derivatives transactions are often not carried out by regulated entities seeking to minimize compliance costs and risk exposure, but by financial intermediaries seeking to profit from developments in emission prices (Button 2008). Not all speculation – whether with emission allowances and credits, or with carbon derivatives – is undesirable in itself, but excessive levels can artificially inflate prices and create detrimental cycles in the market while incentivising risky activities or fraud. In the EU ETS, for instance, some market observers ascribed a dramatic increase in the price of EU allowances (EUAs) after 2018 to speculative activity by financial intermediaries, although an analysis conducted by the European Securities and Markets Authority (ESMA) suggested that speculation played a negligible role in driving EUA prices higher (ESMA 2021).

Still, the foregoing example shows why market oversight extends beyond regulating the 'what' and 'how' of trading to also specifying the 'who'. Specifically, governance of market access in an ETS entails determining who may participate in the market, and under what conditions (Nield and Pereira 2016). Some ETSs have limited market access to compliance entities, for instance, excluding financial intermediaries and other participants out of concern that speculation might contribute to volatility and large price swings. Others allow for broader market access, but limit activities considered particularly prone to abuse or risk, such as derivatives transactions, to registered exchanges, where market access is limited to those participants who are 'members in good standing' with the exchange. Market access can also be made conditional on registration with an authority – such as the financial market regulator – or on meeting specified criteria to obtain an operating license, including capital requirements and notification or disclosure duties. Finding the right balance between openness of the market to ensure liquidity and adequate safeguards to ensure market integrity can be difficult, and it must reflect the specific circumstances in each ETS (see Box 12).

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Closely related to market access is robust data management, which plays an important role in securing market transparency and confidence in its operation. Market access is often made conditional on reporting requirements for different market participants, as well as a duty to retain records and allow access for inspection through the oversight authority. In this context, governance also entails determining what transaction data and other information can be collected and disseminated to ensure market transparency (see also Chapter 5.4). Such data can, in turn, help detect unusual or suspicious trading patterns with advanced software tools. Where responsibility for overseeing trading activity and collecting or storing relevant data is distributed across different actors, proper governance may also entail data sharing or cooperation arrangements.

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Box 11: Market Segments, Units and Derivatives in an ETS

An ETS creates a market for tradable emission units, which allow their holder to emit a specified quantity of GHGs in a specified period of time, typically one metric ton of CO2 equivalent. Emission units – sometimes also referred to as 'permits', 'certificates' or 'compliance instruments'– include the allowances distributed by the ETS administrator through sales, auction, or free allocation, as well as offset credits issued for eligible emission reduction activities. These units can be traded directly between market participants in OTC transactions, or indirectly through exchanges, electronic platforms, and brokers. When allowances or credits are transacted for immediate delivery, such a trade is usually referred to as a 'spot trade', entailing financial settlement upon confirmation that the allowances have been transferred from the registry account of the seller to that of the buyer. A contract – often standardized – will then typically define a settlement process.

Trading activity does not only involve transfers of the foregoing emission units, however. Most ETSs also allow trading in so-called carbon derivatives. Derivatives are financial contracts whose value is derived from the value of an underlying emission unit. Derivatives may constitute a significant share of transactions in the market, given that these instruments are not directly dependent on the volume of allowances available in the marketplace. In some markets such as the EU ETS, in fact, a majority of transactions take the form of derivative contracts. If transaction prices are visible to the wider ETS market, derivative trading can inform market participants on a reasonable range of allowance values. Common derivatives in the carbon trading market include forward sales, futures, swaps, and options:

- Forward sales involve transactions of allowances or credits at a quantity specified contractually by the parties, but with delivery scheduled for a future date. Pricing can be agreed upon in advance, or at a later date, such as the time of delivery. Forward contracts tend to be customized in order to accommodate individually negotiated dates of delivery, cash settlement, volume, 'tenor' (single period blocks or multiple year strips), and other commercial terms, which is why these contracts are not traded on an exchange.
- Futures, by contrast, are standardized contracts involving an established quantity of underlying allowances or credits which will be delivered or cash settled at a known future date. Pricing is determined at initiation of the contract, and each party to the contract is held to fulfill at the specified price. Because of their standard contractual terms, futures can usually only be traded on an exchange, which define the terms and conditions of their use.
- Options afford the buyer the right, but not the obligation, to purchase or sell a given quantity of allowances or credits at a determined price within a specified time frame, regardless of the actual market price. A premium is paid for the right to transact at a set 'strike' price in the future. Options contracts can be traded on both exchanges and OTC markets.
- Swaps are derivatives where two counterparties exchange streams of allowances, offsets, derivatives or cash flows with each other, for instance through buying allowances on the spot market and simultaneously selling them forward. As such, they can lengthen or shorten maturity periods, or help maximize revenue and minimize financing costs. Swaps are commonly traded OTC rather than on an exchange, and the terms of the contract are customized (Monast, Anda, and Profeta 2009).

While adding a level of complexity and entailing unique governance requirements, all the foregoing derivatives can serve as instruments of risk management to hedge price fluctuations in the underlying carbon units, a purpose that is particularly useful at the early – and usually most volatile – stages of an ETS. Derivatives also play a role in offset markets, where credits are not available until emission reductions are verified and registered, forcing many project developers to rely on forward contracts for the necessary capital to develop the projects.

Still, derivative trading is considered riskier than spot trading in emission units because of a perceived lack of transparency and a higher incidence of speculative behaviour. Securitization of derivatives – a process by which often-sophisticated contractual arrangements are sold in tranches on capital markets after origination – can further reduce transparency and accountability. Adequate oversight of derivative trading is therefore critical to ensure that market participants have options to manage the risks associated with price volatility or abatement while avoiding financial instruments whose underlying value and associated risks are difficult to ascertain. Such oversight can be exercised with the same levers that govern market access and the modalities of trading regular emission units, as described earlier in this section. Additionally, the issuance of derivative products is typically conditional on prior regulatory approval or certification.[26]

(26) In 2021, for instance, a new derivative contract, the Global Emissions Offset (GEO) futures contract, was filed for self-certification before the Commodity Futures Trading Commission (CFTC) under the Commodity Futures Modernization Act of 2000, see CME (2021).

Box 12: Market Access Rules in Existing ETSs

Jurisdictions have differed in their approaches to market access for their ETS, each finding its own balance between openness of the market and stringency of restrictions. Experiences in Asia, Europe, and North America illustrate the range of choices available to policy makers, and also provide insights into the reasons behind alternative choices. Under the EU ETS, for instance, the market for emission units grew substantially after its launch in 2005. In order to foster confidence and ensure a safe and efficient trading environment, market access has been subject to an oversight regime designed along the lines of that governing European financial markets. The primary participants in the European carbon market are energy and industrial companies that have compliance obligations. Still, with any natural or legal person able to open a registry account if they meet certain conditions, participation in the market is open to actors other than compliance entities. A number of financial intermediaries, for instance, engage in market transactions, often on behalf of smaller companies (ESMA 2021). Allowing intermediaries access to the market was justified with the need to ensure market liquidity and offer alternative ways to participate in the market. Given the large number and heterogeneity of compliance entities – with some smaller entities lacking the required capacity and experience to apply sophisticated buying and selling strategies in the market – intermediaries saw demand for the services they offered, such as brokering of transactions. Another important service provided by financial intermediaries in the EU ETS is the issuance of derivative products that enable risk management and hedging (see Box 11 above). Still, while market access is relatively broad in the EU ETS, a number of conditions apply for intermediaries to participate in the market (see Box 13 below).

Compared to the EU ETS, access to the Chinese national ETS is more heavily regulated, reflecting a higher level of concern about risks in the financial market. This preoccupation with controlling market risks has manifested itself, among other things, in two aspects of market access: first, in the ability of entities other than compliance entities to participate in trading; and second, in the types of products admitted for trade in the market. Contrary to earlier expectations that trading in the market for emission units would be limited to compliance entities, the regulation on administration of the national ETS market adopted at the end of 2020 specifies that financial institutions and individuals can also participate in the market (MEE 2020). China has taken a more restrictive approach to financial derivative products based on emission units, however, and notably futures contracts. The China Securities Regulatory Commission (CSRC) is the authority responsible for approving services related to derivatives trading as well as new financial products. CSRC approval of the creation of a futures exchange in Guangzhou has opened a door for carbon derivative trading (Reklev 2021), although no actual contracts had been issued and transacted as of late 2021 (Liu and Reklev 2021).

Until 2016, legal entities in Kazakhstan participating in the implementation of offset projects as well as participants in exchange-based trading had access to the market for emission units. This period saw several instances of entities other than compliance entities purchasing emission units and selling them at a much higher value. Because of such incidents, market access was restricted from 2016. Currently, the Environmental Code of the Republic of Kazakhstan specifies that the purchase and sale of emission units can only be carried out by installation operators, offset project developers, and subordinate government entities (Kazakhstan 2007). Similarly, Nova Scotia has decided to limit market access for intermediaries. Given the short timeline to establish the ETS in line with the federal carbon pricing framework, Nova Scotia decided to focus on registering and training compliance entities first and ensuring that the ETS runs smoothly in its initial compliance period. Allowing additional market participants would have entailed further regulatory needs that the province did not have time to adequately analyze and address.

Finally, a registry or some other form of electronic database will typically assign a unique serial number to emission units and track those serial numbers from their issuance onward, capturing information on who has been issued units, who holds them, and when and from whom units are surrendered or canceled. Prior to engaging in unit transfers, market participants have to sign up to the registry and create an account to obtain and hold allowances, usually subject to the operating terms and conditions of the registry, and often incurring an administrative fee (PMR and FCPF 2016).

Many of the criminal activities observed in the EU ETS during its second trading period were only possible due to vulnerabilities of the registry infrastructure (Interpol 2013), and improvements that have since been carried out include enhanced control for account opening with harmonized Know-Your-Customer (KYC) checks, enhanced transaction security with a waiting period prior to transfers, a trusted account list, and improved authentication methods for transactions, strengthened registry oversight with expanded administrator powers to suspend registry access and block transfers, and enhanced protection of good faith acquirers through irrevocability of transfers (see Box 13).

Box 13: Preventing Fraudulent Activities in Existing ETSs

In California and Québec, one of the responsibilities of the ETS lead agencies, CARB and the Québec Ministry of the Environment and the Fight against Climate Change (see Box 4), is to ensure that the market for allowances is free of fraud and other disruptive activity so that it adequately reflects the supply and demand for emission units. To this end, CARB and the Ministry carry out continuous market surveillance and analysis in both jurisdictions. In addition, staff at CARB work closely with an independent market monitor, Monitoring Analytics, to monitor allowance auctions as well as holding and trading of allowances and offset credits. CARB also cooperates with several state and federal agencies – including the California Independent System Operator (CAISO), the Commodity Futures Trading Commission (CFTC), and the Federal Energy Regulatory Commission (FERC). It worked closely with the Office of the Attorney General in California to develop the regulatory framework, which protects against collusion, market power, and price manipulation by imposing holding limits and auction purchase limits. It expressly prohibits any trading that involves manipulative practices or attempts to corner the market, as well as fraud, attempted fraud, or false or inaccurate reports. On the Québec side, the ministry collaborates with many other ministries and public agencies such as Québec's energy regulator (Régie de l'énergie du Québec), its revenue agency (Revenu Québec) or its financial market regulatory agency (Autorité des marchés financiers). The Québec regulatory framework is aligned with California's to protect market integrity.

In the EU ETS, oversight of the market for emission units is shared by various actors, including ESMA and, under its coordination, the national competent authorities in each Member State responsible for financial market surveillance. Other actors, such as auction platforms, exchanges, and financial intermediaries, have an active duty to perform checks to prevent, detect, and report cases of suspicious transactions to the national competent authority. In early trading periods, the EU ETS faced a number of security challenges. Back when registries were still operated at the national level, for instance, they were targeted by several cyber-attacks, such as the theft of emission units from Member State accounts (Interpol 2013; Nield and Pereira 2016). Technical and regulatory changes to address those security shortfalls include the consolidation of registries in a centralized Union Registry, which is now a closed system: once an allowance is used for compliance, it is automatically canceled. Additionally, security arrangements in the Registry Regulation were improved, including adoption of KYC rules; new types of accounts (holding accounts, trading accounts, and 'preferred accounts' for larger transaction volumes); delays between transfers to make sure they can be checked; and several other measures to improve security in the system (European Commission 2013). Still, cybersecurity requires constant vigilance as new threats emerge.

Another challenge encountered in the EU ETS in earlier years was the repeated incidents of value added taxation (VAT) fraud, also known as 'carousel' or 'missing trader' fraud, that deprived Member States of significant tax revenue (Europol 2009; Guegan, Lassoudiere, and Frunza 2011). These incidents were enabled by differences in tax rules between Member States and highlighted the complex interactions between the ETS and other policy areas, such as taxation. Following changes to tax legislation that extended the application of the so-called 'VAT reverse charge mechanism' to emissions trading (Kogels 2010), the previous regulatory loophole was closed.

Similarly, EU financial market rules on market abuse, market manipulation, and transparency have been amended to treat emission units like any other financial instrument. Since January 2018, a change to the Markets in Financial Instruments Directive (MiFID 2) mandates trading of derivatives on regulated venues, introduces position limits and reporting requirements for certain derivatives, and classifies allowances as financial instruments (European Union 2014b). Previously, only derivative contracts had fallen within the scope of MiFID. As a result of these regulatory changes, market participants are subject to new registration and licensing duties, disclosure and reporting requirements, and additional disciplines for the previously unregulated spot market. These include protection against market abuse and other types of market misconduct regulated under the Market Abuse Regulation (European Union 2014a). Since these changes to financial market and taxation rules as well as adjustments to the registry were instituted, no new incidents of emission unit theft or VAT fraud have been detected, although the considerable growth in the value of EUAs since 2018 warrants continued vigilance. A recent empirical analysis of the EU ETS, for instance, has suggested continued risk of money laundering – where the carbon market is misused to process illicit profits from criminal activities – which may require further countermeasures (Bussmann 2020).

As the experience in the EU ETS has shown, not all vulnerabilities of the market for emission units will necessarily be addressed from the outset. New Zealand is another example of an evolving governance framework for market oversight. There has been no evidence of fraudulent or criminal practices in the context of the NZ ETS to date, and the Commerce Act 1986, Fair Trading Act 1986, Crimes Act 1961 and existing contracts for counterparty risk have helped address potential market risks. As the value of New Zealand emission units increases with time, however, the risk of fraudulent activity in the NZ ETS may also increase. To ensure that the NZ ETS maintains its high level of integrity, a program of work is currently underway to strengthen governance of the market and introduce a comprehensive legislative framework. The overall objectives of this market governance work program are:

- to facilitate an effective and efficient market governance framework, which supports the broader policy objectives of the NZ ETS;
- to ensure that participants can trade fairly and with integrity, recognising the interests of smaller participants;
- and to design a governance framework that aligns with best practice of established ETS and retains the option for New Zealand to access high-integrity international units in the future if the government chooses to.

5.4 Ensuring Transparency

As part of their transparency framework, existing ETSs set out a number of disclosure requirements for information related to the trading system, variously requiring communication and publication of such information to the public or specific stakeholders, such as other market participants or compliance entities. These disclosure requirements are distinct from the monitoring and reporting obligations that compliance entities are subject to with regard to GHG emissions, and instead serve to improve the smooth functioning of the market as well as to promote public trust, goodwill, and credibility in the system (Deane, Hamman, and Pei 2017).

They contribute to transparency in a broader sense, which can be defined as "the extent to which information is made publicly available within a given social system"(Moon, Welch, and Wong 2005), covering both the flow of information itself as well as its quality and the method of dissemination (Hollyer, Rosendorff, and Vreeland 2017). Such transparency requirements are an expression of the broader trend towards increased public access to information, public participation, and access to justice in environmental matters, all of which are accepted as central pillars of robust environmental governance and even emerging norms in environmental law (Hunter 2014).

Transparency acquires substantial importance in the context of emissions trading, where a sophisticated policy instrument addressing a highly complex threat can quickly challenge the capacity of stakeholders and the broader public to comprehend technical nuances and the implications and impacts of alternative policy choices. Additionally, the market for emission units is itself highly dependent on information to function efficiently, including data on emissions and other fundamental factors that influence demand for emission units, and data on transactions and prices in the market that influence market behavior and strategic decision making.[27]

Robust transparency requirements encompass three different dimensions of transparency:
1) consideration of who possesses information;
2) consideration of which data or documents need to be disclosed; and 3) consideration of who is entitled to those documents (Schauer 2011). Importantly, to be meaningful, transparency should not only be internal to a policy regime, meaning that only those managing and participating in that regime are privy to relevant information, but also should include wider dissemination of information, including its availability to the public. In some jurisdictions, for instance, publication of emissions data is mandatory under rules on access to information in environmental matters.

Importantly, to be meaningful, transparency should not only be internal to a policy regime... but also should include wider dissemination of information, including its availability to the public.

Accordingly, in the context of emissions trading, information disclosure requirements can relate to various aspects of system design and operation. Aside from the duties to collect, report, and verify installation- or company-level emissions data described earlier (see Chapter 5.2), transparency obligations can extend to information on aggregate emissions and emission trends under the trading system, information about allowance distribution, including auction results and use of proceeds, information on offset credit issuance, market and transaction data, as well as information related to compliance and enforcement.

Likewise, the subjects of these requirements – that is, the entities under an obligation to disclose information – can range from public authorities, such as the government body administering the ETS, to market facilitators and intermediaries, such as exchanges, to the compliance entities themselves. Such obligations also include provisions for the when and how sensitive data is made available, so as to ensure, for instance, that information relevant to price developments in the market is disclosed in a predictable process and

(27) Without effective price-revealing mechanisms in place, there is a high likelihood that information asymmetries between governments and participating entities will prevent adequate price discovery and thus equalization of prices at the margin of abatement costs; that, in turn, will reduce the overall efficiency of the carbon market as a mitigation policy, see Flachsland, Marschinski, and Edenhofer (2009)

not leaked prematurely or shared asymmetrically, which might benefit some market participants and not others. Similarly, some data may be subject to privacy or confidentiality rules, limiting its disclosure. Box 14 below describes how California has ensured transparency across a variety of aspects of its ETS.

With a view to increasing transparency about market and transaction data, exchanges and other facilitating entities may be required to publicize daily information on settlement prices, volume, open interest, and opening and closing ranges for all allowances, credits and carbon derivatives traded on the trading facility.[28] OTC trading, by contrast, is typically not standardized, and transaction data consequently is more difficult to obtain and aggregate; to improve access to OTC transaction data, all market participants – not just exchanges and professional intermediaries – can be asked to register with an oversight institution and provide pricing information for transactions exceeding certain volume thresholds, for instance where such transactions are determined to have a significant effect on carbon price discovery due to their size and relevance. Additionally, they can be required to maintain trading protocols and detailed records of all transactions for the purposes of identifying and providing evidence of manipulation. To date, however, such requirements are not common in emissions trading.

Box 14: California and Québec's Approaches to ETS Transparency

In California and Québec, CARB and the Québec Ministry of the Environment and the Fight against Climate Change are committed to providing a wide range of information to the public on virtually all aspects of their respective ETS. They do this because it supports the operation of the ETS, notably to ensure efficient market operation. The information provided to the public ranges from reported and third-party verified GHG emissions data, offset credit issuance, compliance results, auction announcements, auction results, aggregated allocation information, market data, and enforcement actions. In addition, CARB and the Québec Ministry of the Environment provide extensive information on the overall GHG emissions inventory, which utilizes verified GHG data to indicate progress towards achieving overall emissions reductions, and a full accounting of the expenditure of proceeds from quarterly auctions. Because the ETS deals with multiple private and public companies, certain types of information – such as those related to confidential business information – may be protected from disclosure pursuant to the California Public Records Act, Québec's Act respecting Access to Documents Held by Public Bodies and the Protection of Personal Information, and other applicable privacy laws.

CARB and the Québec Ministry of the Environment publicly post information about each auction in a coordinated fashion to ensure market participants and the public are provided with simultaneous access to information via public web postings about available supply, requirements for participating, summary results statistics, and proceeds. CARB and the Québec Ministry also take considerable steps to ensure there are no data leaks or information asymmetries where one part of the market obtains data before the rest of the market. For market-sensitive information, such as auction results, notifications of the posting time of such information are announced in advance. Enforcement actions and settlements are publicly posted as they arise. Other ETS-related data, such as compliance information, allowance allocation, and GHG emissions, are posted annually.

CARB and the Québec Ministry of the Environment balance extensive data transparency with the protection of market-sensitive information and confidential business information through regular public release of information on specific schedules, clear rules, penalties, and robust enforcement of rules related to protected information. Robust procedures, internal oversight, and trained staff dedicated to market oversight are required to ensure proper disclosure of information and the protection of market-sensitive information and confidential business information. CARB and the Québec Ministry of the Environment therefore apply strict internal policies and procedures to ensure the security of all personal information provided by ETS market participants. Additionally, there are penalties for violating state and federal privacy rules in California and provincial privacy rules in Québec.

Strict rules are also in place to ensure that ETS participants protect market-sensitive information, and CARB and the Québec Ministry of the Environment can take enforcement action if there is any inappropriate use or disclosure of market-sensitive information. Market monitoring and robust enforcement are key to ensuring these rules are followed and the integrity of the market is protected. Program rules prohibit auction participants from releasing information regarding auction or reserve sale participation. This includes a prohibition on releasing information regarding an intent to participate or not to participate in an auction; auction approval status; bidding strategy at past or future auctions; bid price and bid quantity information at past or future auctions; and the amount of any bid guarantee provided to the financial services administrator. CARB evaluates the disclosure of such information and takes enforcement actions when necessary. Table 12 provides further details on the transparency measures and timelines in California.

(28) An effective means of increasing market transparency, moreover, can be to require the use of an automated quotation system or a central limit order book (CLOB). Operated either by a public agency or a private exchange, such a CLOB provides a central location to consolidate unexecuted market orders, either automatically ('hard' CLOB) or by providing market participants with information to facilitate trading ('soft' CLOB). At a minimum, it shows orders to buy and sell as well as the name of the intermediary (market maker) posting each order.

Table 12: Transparency Measures in the California ETS

Information Category	Information Type	Disclosure Requirement	Disclosing Entity	Timing
Emissions	Emissions Data and Reporting	Mandatory Greenhouse Gas Reports	Regulator (CARB) based on verified emission reports of reporting facilities	Annually
		CARB Pollution Mapping Tool	Regulator (CARB)	Ongoing
		List of Accredited Verifiers	Regulator (CARB)	Ongoing
	Emissions Inventory	GHG Inventory Website	Regulator (CARB)	Ongoing
		GHG Inventory Trends	Regulator (CARB)	Annually
Allowances and Offsets	Unit Allocation	Allocation Percentages for Electrical Distribution	Regulator (CARB)	Annually
		Industrial Benchmarks, Assistance Factors, Cap Adjustment Factors	Regulator (CARB)	Annually
		Report on Use of Allocated Allowance Value	Regulator (CARB), based on annual reports of allocation recipients	Annually
	Auction Announcement	Auction Notice	Regulator (CARB)	Quarterly
		Annual Auction Reserve Price Notice	Regulator (CARB)	Annually
	Auction Results	Joint Auction Summary Results Report	Regulator (CARB)	Quarterly
		Post-Auction Public Proceeds Report	Regulator (CARB)	Quarterly
		Reserve Sales	Regulator (CARB)	When conditions for reserve sale met
	Offsets	List of Offsets Issued	Regulator (CARB)	Biweekly
		Offset Credit Issuance Table	Regulator (CARB)	Biweekly
		List of Accredited Offset Verifiers	Regulator (CARB)	Ongoing
Market Activity	Market Data	Report on Market Transfers	Regulator (CARB)	Annually
		CITSS Registrant Report	Regulator (CARB)	Quarterly
		Compliance Instrument Report	Regulator (CARB)	Quarterly
Compliance	Compliance	Compliance Report	Regulator (CARB)	Annually
	Enforcement	List of Settlement Agreements	Regulator (CARB)	Ongoing
Revenue Use	Auction Proceeds Expenditure/Climate Investments	California Climate Investments Website	Regulator (CARB)	Ongoing
		California Climate Investments Map	Regulator (CARB)	Ongoing
		Climate Investments Report to the Legislature	Regulator (CARB)	Annually

5.5 Resolving Conflicts

In the course of operating an ETS, conflicts between different actors will invariably arise and call for resolution. Because the economic stakes can be significant, the ability to resolve emerging disputes in a peaceful and orderly manner is critical to secure confidence in the market and ensure acceptance of the outcomes. Conflicts can originate in a variety of causes and occur between all actors involved in or affected by an ETS, including compliance entities, other market participants and stakeholders, and government entities. Box 15 lists types of conflicts between different actors or groups of actors in an ETS and provides relevant examples.

Settling such conflicts can involve a variety of formal and informal means, often beginning with informal mediation between parties to seek a negotiated outcome and avoid unnecessary costs and delays. Mediation may not always offer the desired recourse to one or more parties to a dispute, however, so they may instead opt for more formal means of conflict resolution. Such means include binding arbitration – where parties still have control over the process, including the arbitrators appointed to decide on the outcome – or judicial proceedings before a public court, the most confrontational option with the least amount of control by parties.

Each of these approaches to dispute resolution is subject to negotiated or mandatory rules of procedure, and typically involves a process that begins with the filing of a complaint or some other type of application, a discovery stage geared toward finding of relevant facts, and a hearing or trial. It concludes with a decision or judgment, which can take different forms – depending on the underlying conflict – such as a legal remedy including compensatory damages, or sanctions for a civil or criminal offense. Often, the process ends before a decision or judgment is handed down because parties agree to a negotiated settlement. Depending on the jurisdiction and context, parties may also have a right to appeal the outcome, with differences in terms of availability of an appeal, the scope of review, and the remedies it affords.

In the course of operating an ETS, conflicts between different actors will invariably arise and call for resolution.

Box 15: Examples of Conflicts in an ETS

Conflicts between market participants: Parties to a transaction involving the transfer of units or related financial products may find themselves in a dispute over the terms of the transaction, such as the price and quantity of units or the timing of delivery, or seek redress for flawed or incomplete performance. In cases of fraudulent market behavior, a market participant may seek recovery of stolen units from another market participant who purchased them in good faith. Conflicts may also involve market intermediaries, such as trading platforms, brokers, and lenders, for instance if a market participant violates the contractual terms of an exchange or fails to repay a loan.

An example of a dispute between market participants is the case of Armstrong DLW GmbH v. Winnington Networks Ltd. before the High Court of Justice of the United Kingdom, in which Armstrong DLW GmbH, the plaintiff, sought relief for allowances stolen by a third party and purchased by Winnington Networks Ltd., the defendant, who argued it had done so in good faith.[29] Ultimately, the court decided that Armstrong DLW GmbH was entitled to monetary restitution.

Conflicts between compliance entities and the government: Conflicts can also involve compliance entities seeking legal recourse against decisions of a government agency, such as the ETS administrator. Such conflicts can arise, for instance, where a compliance entity challenges a decision on the free allocation of units, or appeals a decision that it has failed to comply with its obligations under the ETS. Designated compliance entities or other stakeholders have even challenged plans to introduce an ETS based on a perceived violation of constitutional rights.

Examples of conflicts between compliance entities and the government include the case of ArcelorMittal Rodange et Schifflange SA v. État du Grand-duché de Luxembourg before the European Court of Justice (ECJ), in which the claimant, a compliance entity under the EU ETS, challenged the ability of Luxembourg to request the surrender of unused allowances after the claimant ceased to engage in emitting activities;[30] or an earlier case decided by the German Federal Administrative Court (Bundesverwaltungsgericht, or BVerwG), in which the court rejected the appeal of a cement manufacturer who had claimed that its inclusion in the scope of the EU ETS had the effect of an expropriation and violated its fundamental rights under European law and the German constitution.[31]

Conflicts between other stakeholders: Because an ETS can affect many segments of civil society, disputes can also arise beyond direct market participants. Concerns about environmental justice, for instance, have prompted advocacy groups to file challenges against ETS policies where these have been claimed to offer insufficient protections for minorities and other disadvantaged constituencies. Even jurisdictions can find themselves in ETS-related legal disputes, for instance if a national government challenges the authority of a subnational government to operate its own ETS.

For instance, in the case of California Chamber of Commerce et al. v. California Air Resources Board et al. decided by the California Court of Appeal, the plaintiffs unsuccessfully challenged the Californian ETS because, as they saw it, the requirement to purchase emissions allowances through auction constituted a tax that had not been properly authorized by the State legislature and was therefore illegal under the California Constitution.[32] Similarly, in the case of United States v. California before the U.S. District Court for the Eastern District of California, the U.S. federal government unsuccessfully challenged the California ETS and its linking agreement with the Canadian province of Québec.[33]

(29) High Court of Justice of the United Kingdom, Armstrong DLW GmbH v. Winnington Networks Ltd. [2012] EWHC 10, [2013] Ch 156 (Ch). (30) European Court of Justice, Case C-321/15, ArcelorMittal Rodange et Schifflange SA v. État du Grand-duché de Luxembourg, Judgment of the Court (Fifth Chamber) of 8 March 2017, ECLI:EU:C:2017:179. (31) Federal Administrative Court (Bundesverwaltungsgericht), Case BVerwG 7 C 26.04, Judgment of 30 June 2005, ECLI:DE:BVerwG:2005:300605U7C26.04.0. (32) California Court of Appeal, California Chamber of Commerce et al. v. California Air Resources Board et al., 10 Cal. App. 5th 604, 216 Cal. Rptr. 3d 694 (2017). (33) United States District Court for the Eastern District of California United States of America, Plaintiff, v. the State of California; Gavin C. Newsom, in his official capacity as Governor of the State of California et al., 444 F. Supp. 3d 1181 (E.D. Cal. 2020).

06. Third Phase: Reviewing and Amending the ETS

Chapter 6 provides an overview of ETS review and system changes, and describes why the governance of these processes matters. Specifically, it describes approaches to performance review and evaluation, and the role of independent advisory bodies in this process. It also discusses scheduled or unscheduled changes to the ETS design, as well as ways to ensure robust governance through transparent and consistent procedures, timelines and institutional responsibilities.

6.1 Reviewing Performance

Performance review is an important part of the policy cycle (Chapter 2.3), enabling the evaluation and adjustment of an ETS in a continuously evolving context. Such a review can be targeted, focusing on a specific aspect of ETS design or implementation, or it can be comprehensive, and serve to assess whether the ETS has met its objectives and how it can be fundamentally improved (PMR and ICAP 2021). Performance reviews can also be scheduled in advance, for instance at the end of an ETS trading period, or they can be performed spontaneously in response to unforeseen developments, such as a system shock. Existing programs have approached performance review very differently. Some, such as the New Zealand ETS, require periodic reviews at specified milestones in the evolution of the ETS, whereas others, such as the EU ETS, the Québec ETS and RGGI, provide considerable discretion regarding the need for and timing of a review. Box 16 describes the procedures for performance review in these systems.

In the context of performance review, the government agencies charged with designing and implementing the ETS may be exposed to claims of bias or partiality. An increasing number of jurisdictions have therefore opted to rely on independent advisory bodies – such as a scientific council or climate change committee – to conduct the review of their ETS, or to inform and complement a review led by the government with an external opinion. Because of their independence, such bodies tend to enjoy a high degree of credibility with stakeholders and the general public. Independent advisory bodies can take different shapes, from formally instituted and permanent councils or committees to temporary scientific expert groups. Box 17 (pg.64) describes the contribution of an advisory body to the review of the NZ ETS.

Box 16: Performance Review in Existing ETSs

In New Zealand, the Climate Change Response Act 2002 enables the Minister for Climate Change to initiate a review of the operation and effectiveness of the NZ ETS at any time. Three reviews have taken place, the first in 2008, the second in 2011, and the most recent spanning 2015-16. The three reviews of the NZ ETS have been undertaken in different ways, but each has called for written submissions from the public which were taken into consideration. For the 2008 review, a special committee was established by the Parliament. The committee called for written submissions and selected a number of submitters to speak to the committee in person. In 2010, the Minister for Climate Change appointed an independent Review Panel and established Terms of Reference for its work. The review took place in 2011, and the Panel called for submissions and met with a number of stakeholders. For each stage of the 2015-16 review, a discussion document prepared by the Ministry for the Environment was released along with a call for written submissions. A series of public meetings accompanied each stage of the review, and each review has taken into account obligations of the Crown to Māori under the Treaty of Waitangi.

In the EU ETS, the inclusion of trading phases implied from the outset that periodic reviews would occur. Such reviews would be milestones to evaluate the functioning of the system and determine whether improvements would be needed for the subsequent phase. Still, the EU ETS Directive does not set out an explicit obligation to conduct a review before each new trading phase, and instead requires the European Commission to publish an annual report on the functioning of the carbon market for transparency purposes. It also includes review clauses on specific issues, along with a general clause for a review scheduled after 2023. What is not specified in detail is the scope of these reviews, and whether they can be broad programmatic reviews or need to instead include an in-depth analysis as well as concrete reform proposals. Occasionally, ad-hoc developments have prompted an unscheduled evaluation and reform of the EU ETS, for instance regarding the establishment of the MSR as a reaction to the accumulation of an emission unit surplus. Also, any major legislative reform of the EU ETS has been preceded by an RIA (see Chapter 4.1.3) assessing its expected economic and environmental impacts.

Neither the Québec ETS nor RGGI specify a mandatory program review.[34] Instead, management staff in Québec and California, to which the Québec system is linked, engage in informal conversations on a weekly basis at the management and professional team level to assess the functioning of the ETS and discuss any issues observed or reported by stakeholders or participants that might require attention. This ongoing exchange of views is supported by analysis and consultation with third parties, such as an external market monitor or WCI, Inc. If it identifies a need for changes to the ETS, the process results in a consultation to ensure broad awareness of any pending amendments. Similarly, in RGGI, member jurisdictions decide by consensus to initiate a program review. RGGI was launched in 2009, with a first program review in 2012, a second in 2016, and a third in 2021. Each review has involved solicitation of stakeholder views through formal meetings and consultations with external constituencies, as well as internal processes involving environmental and utility regulators from each member jurisdiction. Program reviews have taken between one and two years, and have resulted in identification of a number of recommended changes to the system. At the end of each review, the date of the next review has been announced.

(34) That is not to say that Québec does not carry out targeted reviews ahead of certain ETS amendments, such as setting the emissions cap every ten years, which is closely linked to the multi-stakeholder process of defining Québec's overall GHG reduction targets; likewise, the periodic revision of rules on free allocation of emission units is accompanied by formal consultations.

Performance reviews can also be scheduled in advance, for instance at the end of an ETS trading period, or they can be performed spontaneously in response to unforeseen developments, such as a system shock.

Box 17: Independent Advisory Bodies in New Zealand

In New Zealand, a number of independent bodies have a role in providing advice on the functioning of the ETS. The Climate Change Commission is a recently-established Crown Entity that provides independent, evidence-based advice to the government on mitigating climate change and adapting to the effects of climate change. It also monitors and reviews progress towards emissions and climate adaptation goals. Its independence means it can provide impartial advice, challenge the government, and hold it to account. The Climate Change Commission made submissions on the Climate Change Response (Emissions Trading Reform) Amendment Bill 2020 as well as NZ ETS unit supply and price control regulations. These submissions showed support for strengthening the NZ ETS and offered recommendations for further improvement, for example suggesting that auction price controls should increase year-on-year to signal increasing mitigation ambition. In May 2021, the Climate Change Commission issued its first formal advisory report to the government, which was preceded by public consultations on a draft report released in February 2021. Among other things, the Climate Change Commission's advice included recommendations on the level of the first three emissions budgets covering from 2022 to 2035, which aim to put New Zealand on track to meeting its 2030 and 2050 emissions targets. The Minister for Climate Change is not bound to follow the advice of the Commission, but must respond to it within a specified timeline and explain the reasons for any decisions that differ from its advice. Such reasoning must be published in a publicly available report.

The New Zealand Productivity Commission, another independent Crown entity, provides advice to the government on improving productivity in a way that supports the wellbeing of New Zealanders. The Commission commented on the NZ ETS in a 2018 report which advised on how New Zealand could best make the transition to a low-emission economy while continuing to grow incomes and wellbeing. The report recommended reforming the NZ ETS, with a focus on making it effective in achieving the country's NDC and its commitment to substantially reduce net domestic GHG emissions. The Productivity Commission's suggestions were taken into account during the Climate Change Response (Emissions Trading Reform) Amendment Bill process.

Finally, the Parliamentary Commissioner for the Environment is an independent Officer of the New Zealand Parliament who reviews and provides independent advice about environmental concerns. The Commissioner has provided submissions on reviews of the NZ ETS and on legislation to make changes to the system, along with comments on the NZ ETS issued in its reports.

6.2 Managing System Change

Representing a complex policy instrument operating in a constantly evolving geophysical and socioeconomic context, an ETS will invariably have to adjust to changing circumstances over time. As described in the previous section, the impetus for such adjustments of an ETS may stem from a review of its performance, if that review has revealed design flaws and opportunities for improvement. It may also originate in an external development, such as a change in political leadership or an unforeseen economic shock. Either way, changes to an ETS can have consequential implications for its functioning, influencing unit prices, asset values, and perceptions of market participants and the broader public. Ensuring that any modifications to the ETS are implemented in a balanced and transparent way is therefore critical to sustain confidence in the system (PMR and ICAP 2021). Many of the steps already encountered during the initial establishment of the ETS – such as stakeholder engagement and robust communications – acquire renewed importance. Box 18 below describes experiences made in various jurisdictions when changing an existing ETS.

Many of the steps already encountered during the initial establishment of the ETS – such as stakeholder engagement and robust communications – acquire renewed importance.

Box 18: Managing System Change in Existing ETSs

In Québec, the ETS has been relatively stable since it was launched, enabling it to provide a more predictable price signal for changes to investment and corporate behavior. Likewise, system stability has lowered uncertainty about the revenue generated through auctioning and the investments such revenue enables. Still, expanding the coverage of the ETS was intended from the outset: when the system design was first being elaborated, the jurisdictions participating in the WCI still needed to work through potential issues in the reporting system for the fuel distribution sector, in contrast to the accurate emissions reporting and monitoring methods that already existed for the industrial and electricity sectors. To leave more time to collect data and consider implications, the ETS started covering fuels in 2015, rather than in 2013 when the system was initially launched. Consultations with stakeholders formed an important part of this change, as did transparency and coordination across all relevant levels of government. Also, a clear legal authorization to effect changes – and notably technical details – through executive regulation proved helpful, as it obviated the need to enter the cumbersome process of formal legislation.

By contrast, the EU ETS has evolved significantly since its inception, yet each major reform had to be preceded by formal legislation – often requiring several years to develop and adopt – to amend the underlying EU ETS Directive and other provisions. Major changes to the EU ETS have included the expansion to new sectors, such as aviation and aluminum, as well as adjustments to how emission units are allocated. Similarly, the manner in which the overall emissions ceiling, or cap, is established has evolved over time, transitioning from a decentralized approach determined by the Member States to a centralized approach managed at the level of the EU; at the same time, the cap has become significantly more stringent, decreasing in a linear way to increase predictability, and an MSR has been created to adjust the supply of emission allowances.

In New Zealand, finally, major reforms have also required legislative changes, with the most recent of these implemented through adoption of the Climate Change (Emissions Trading Reform) Amendment Act 2020. Over time, changes have been made to improve the effectiveness of the ETS, moderate its impacts in the wake of the global financial crisis, reflect changing economy-wide emission reduction targets and international commitments, and improve technical and operational elements. The latest review (2015-16) found that changes would be needed to ensure the ETS would be fit for purpose to meet the emissions reduction targets in the Paris Agreement.

Bibliography

Aasrud, André, Richard Baron, and Katia Karousakis.
2010. "Market Readiness: Building Blocks for Market Approaches." No. 2010/03. OECD/IEA Climate Change Expert Group Papers. Paris: OECD Publishing. https://bit.ly/3LGqu5R

Acworth, William, Ernst Kuneman, Stephanie La Hoz Theuer, Jan Abrell, Julia Baer, Regina Betz, Mirjam Kosch, et al.
2019. "Influence of Market Structures and Market Regulation on the Carbon Market." Berlin: German Emissions Trading Authority (DEHSt). https://bit.ly/3BoqBOH

Acworth, William, Mariza Montes de Oca, Anatole Boute, Carlotta Piantieri, and Felix Christian Matthes.
2020. "Emissions Trading in Regulated Electricity Markets." Climate Policy 20 (1): 60–70. https://bit.ly/3LGqu5R

Annan, Kofi A.
1998. "Report of the Secretary-General on the Work of the Organization." UN Doc. A/53/1. New York, NY: United Nations. https://bit.ly/3JOe61Z

Anttonen, Karoliina, Michael Mehling, and Karl Upston-Hooper.
2007. "Breathing Life into the Carbon Market: Legal Frameworks of Emissions Trading in Europe." European Energy and Environmental Law Review 16 (4): 96–115.

Baron, Richard, André Aasrud, Jonathan Sinton, Nina Campbell, Kejun Jiang, and Xing Zhuang.
2012. "Policy Options for Low-carbon Power Generation in China: Designing an Emissions Trading System for China's Electricity Sector." 2012/12. Insights Series 2012. Paris: International Energy Agency. https://bit.ly/3Bsfp3j

Bell, Ruth Greenspan.
2003. "Choosing Environmental Policy Instruments in the Real World." CCNM/GF/SD/ENV(2003)10/FINAL. CATEP Forum. Paris: Organisation for Economic Co-operation and Development (OECD). http://www.oecd.org/environment/cc/2957706.pdf.

———. 2006. "The Kyoto Placebo." Issues in Science and Technology 22 (2): 28–31.

Bernstein, Steven.
2011. "Legitimacy in Intergovernmental and Non-State Global Governance." Review of International Political Economy 18 (1): 17–51. https://doi.org/10.1080/09692290903173087.

Betz, Regina, and Misato Sato.
2006. "Emissions Trading: Lessons Learnt from the 1st Phase of the EU ETS and Prospects for the 2nd Phase." Climate Policy 6 (4): 351–59. https://doi.org/10.1080/14693062.2006.9685607.

Bevir, Mark.
2012. Governance: A Very Short Introduction. Very Short Introductions. Oxford: Oxford University Press.

Birkland, Thomas A.
2020. An Introduction to the Policy Process: Theories, Concepts, and Models of Public Policy Making. Routledge.

Börzel, Tanja A., Thomas Risse, and Anke Draude.
2018. "Governance in Areas of Limited Statehood: Conceptual Clarifications and Major Contributions of the Handbook." In The Oxford Handbook of Governance and Limited Statehood, edited by Anke Draude, Tanja A. Börzel, and Thomas Thomas, 3–25. Oxford: Oxford University Press. https://doi.org/10.1093/oxfordhb/9780198797203.013.1.

Brewer, Thomas L., and Michael A. Mehling.
2014. "Transparency of Climate Change Policies, Markets, and Corporate Practices." Edited by Jens Forssbæck and Lars Oxelheim. The Oxford Handbook of Economic and Institutional Transparency, October, 179–97. https://doi.org/10.1093/oxfordhb/9780199917693.013.0008.

Bussmann, Kai-D.
2020. "Detecting Money Laundering in Emissions Trading." 20/2020. Texte. Dessau: Umweltbundesamt. https://bit.ly/35412q5

Button, Jillian.
2008. "Carbon: Commodity or Currency? The Case for an International Carbon Market Based on the Currency Model." Harvard Environmental Law Review 32 (2): 571–96.

Cairney, Paul.
2020. Understanding Public Policy: Theories and Issues. 2nd ed. London: Red Globe Press.

California.
2010. "Subchapter 10 (Climate Change), Article 5, Sections 95800 to 96023, Title 17, California Code of Regulations: California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms." https://bit.ly/3oV74QW

———. 2011. "California's Cap-and-Trade Program: Final Statement of Reasons." California Air Resources Board. https://ww3.arb.ca.gov/regact/2010/capandtrade10/fsor.pdf.

Canada.
2018. "Greenhouse Gas Pollution Pricing Act, S.C. 2018, c. 12, s. 186." https://bit.ly/3rSUhAg

Chan, Michelle.
2009. "Lessons Learned from the Financial Crisis: Designing Carbon Markets for Environmental Effectiveness and Financial Stability." Carbon & Climate Law Review 3 (2): 152–60.

Clark, Kelly, Aurelie Gauthier, and Natalie Pinon.
2010. "Assessing the Structural Capacity Requirements That Would Allow Developing Countries to Participate in Evolving Carbon Markets." London: Marmanie Consulting Ltd. https://bit.ly/3JuWUhE

CME.
2021. "CFTC Regulation 40.6(a) Certification: Notification Regarding the Initial Listing of the Physically-Delivered CBL Global Emissions Offset Futures Contract." New York, NY: Chicago Mercantile Exchange (CME) Group. https://bit.ly/3By13yI

Cole, Daniel H.
2016. "Origins of Emissions Trading in Theory and Early Practice." In Research Handbook on Emissions Trading, edited by Stefan E. Weishaar, 9–26. Cheltenham: Edward Elgar.

Commission on Global Governance.
1995. Our Global Neighborhood: The Report of the Commission on Global Governance. Oxford: Oxford University Press. https://bit.ly/3v2fPfA

Deane, Felicity, Evan Hamman, and Yilin Pei.
2017. "Principles of Transparency in Emissions Trading Schemes: The Chinese Experience." Transnational Environmental Law 6 (1): 87–106. https://doi.org/10.1017/S2047102516000145.

ESMA.
2021. "Emission Allowances and Derivatives Thereof. Preliminary Report." ESMA70-445–7. Paris: European Securities and Markets Authority (ESMA). https://bit.ly/3LGqkvh

European Commission.
2013. "Commission Regulation (EU) No 389/2013 of 2 May 2013 Establishing a Union Registry Pursuant to Directive 2003/87/EC of the European Parliament and of the Council, Decisions No 280/2004/EC and No 406/2009/EC of the European Parliament and of the Council and Repealing Commission Regulations (EU) No 920/2010 and No 1193/2011, OJ L 122/1." https://bit.ly/3BrHEPC

———. 2018a. "Commission Implementing Regulation (EU) 2018/2066 of 19 December 2018 on the Monitoring and Reporting of Greenhouse Gas Emissions Pursuant to Directive 2003/87/EC of the European Parliament and of the Council and Amending Commission Regulation (EU) No 601/2012, OJ L 334/1." https://bit.ly/3JuYbFs

———. 2018b. "Commission Implementing Regulation (EU) 2018/2067 of 19 December 2018 on the Verification of Data and on the Accreditation of Verifiers Pursuant to Directive 2003/87/EC of the European Parliament and of the Council, OJ L 334/94." https://bit.ly/3gQn4iC

European Commission, Marta Ballesteros, Matthieu Wemaëre, Leonie Reins, Virginie Rouas, Arne Riedel, Michael Mehling, Benjamin Görlach, and István Bart.
2019. "Legal Nature of EU ETS Allowances: Final Report." ML-02-19-546-EN-N. Luxembourg: Publications Office of the European Union. https://doi.org/10.2834/014995.

European Court of Auditors.
2015. "The Integrity and Implementation of the EU ETS." EN 2015 No. 06. Luxembourg: Publications Office of the European Union. https://bit.ly/3oSiQLG

European Union.
2003. "Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 Establishing a Scheme for Greenhouse Gas Emission Allowance Trading Within the Community and Amending Council Directive 96/61/EC." https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32003L0087&from=EN.

———. 2014a. "Regulation (EU) No 596/2014 of the European Parliament and of the Council of 16 April 2014 on Market Abuse (Market Abuse Regulation) and Repealing Directive 2003/6/EC of the European Parliament and of the Council and Commission Directives 2003/124/EC, 2003/125/EC and 2004/72/EC, OJ L173/1." https://bit.ly/3Bsgbxf

———. 2014b. "Directive 2014/65/EU of the European Parliament and of the Council of 15 May 2014 on Markets in Financial Instruments and Amending Directive 2002/92/EC and Directive 2011/61/EU, OJ L 173/349." https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32014L0065.

Europol.
2009. "Carbon Credit Fraud Causes More Than 5 Billion Euros Damage for European Taxpayer." 2009. https://bit.ly/3sJG4oC

Fischer, Carolyn, and Richard G. Newell.
2008. "Environmental and Technology Policies for Climate Mitigation." Journal of Environmental Economics and Management 55 (2): 142–62. https://doi.org/10.1016/j.jeem.2007.11.001.

Flachsland, Christian, Robert Marschinski, and Ottmar Edenhofer.
2009. "Global Trading versus Linking: Architectures for International Emissions Trading." Energy Policy 37 (5): 1637–47. https://doi.org/10.1016/j.enpol.2008.12.008.

Fukuda-Parr, Sakiko, Carlos Lopes, and Khalid Malik.
2002. "Institutional Innovations for Capacity Development." In Capacity for Development: New Solutions to Old Problems, 1–21. London: Earthscan. https://digitallibrary.un.org/record/472608.

Fukuyama, Francis.
2013. "What Is Governance?" Center for Global Development Working Paper No. 314. Washington, DC: Center for Global Development. https://doi.org/10.2139/ssrn.2226592.

Giles, Cynthia.
2013. "Next Generation Compliance." The Environmental Forum 13 (5): 22–26.

———. 2021. "Part 4: Preventing Widespread Violations That Threaten Climate Goals." In Next Generation Compliance: Environmental Regulation for the Modern Era. Cambridge, MA: Harvard Law School. https://bit.ly/3BtB0su

Gisselquist, Rachel M.
2012. "Good Governance as a Concept, and Why This Matters for Development Policy." WIDER Working Paper 2012/30. Helsinki: The United Nations University World Institute for Development Economics Research (UNU-WIDER). https://www.econstor.eu/handle/10419/81039.

Goron, Coraline, and Cyril Cassisa.
2016. "Regulatory Institutions and Market-Based Climate Policy in China." Global Environmental Politics 17 (1): 99–120. https://doi.org/10.1162/GLEP_a_00392.

Grumbach, Jacob M.
2015. "Polluting Industries as Climate Protagonists: Cap and Trade and the Problem of Business Preferences." Business and Politics 17 (4): 633–59. https://doi.org/10.1515/bap-2015-0012.

Guegan, Dominique, Antonin Lassoudiere, and Marius-Cristian Frunza.
2011. "Missing Trader Fraud on the Emissions Market." Journal of Financial Crime 18 (2): 183–94. https://doi.org/10.1108/13590791111127750.

Hahn, Robert W.
1984. "Market Power and Transferable Property Rights." Quarterly Journal of Economics 99 (4): 753–65. https://doi.org/10.2307/1883124.

Haites, Erik F., and Geoffrey Bird.
2002. An Emerging Market for the Environment: A Guide to Emissions Trading. Roskilde et al.: United Nations Environment Programme (UNEP) and United Nations Conference on Trade and Development (UNCTAD). https://bit.ly/3JweYIm

Hausotter, Tobias, and Michael Mehling.
2013. "Building capacity for emissions trading: The ICAP training courses for emerging economies and developing countries." Carbon & Climate Law Review 6 (4): 408–13. https://doi.org/10.21552/CCLR/2012/4/236.

Hindin, David A., and Jon D. Silberman.
2016. "Designing More Effective Rules and Permits." George Washington Journal of Energy & Environmental Law 7 (2): 103–23.

Hintermann, Beat.
2011. "Market Power, Permit Allocation and Efficiency in Emission Permit Markets." Environmental and Resource Economics 49 (3): 327–49. https://doi.org/10.1007/s10640-010-9435-9.

———. 2017. "Market Power in Emission Permit Markets: Theory and Evidence from the EU ETS." Environmental and Resource Economics 66 (1): 89–112. https://doi.org/10.1007/s10640-015-9939-4.

Hollyer, James R., B. Peter Rosendorff, and James Raymond Vreeland.
2017. "Measuring Transparency." Political Analysis 22 (4): 413–34. https://doi.org/10.1093/pan/mpu001.

Howlett, Michael, and Ben Cashore.
2014. "Conceptualizing Public Policy." In Comparative Policy Studies: Conceptual and Methodological Challenges, edited by Isabelle Engeli and Christine Rothmayr Allison, 17–33. London: Palgrave Macmillan. https://doi.org/10.1057/9781137314154_2.

Hunter, David B.
2014. "The Emerging Norm of Transparency in International Environmental Governance." In Research Handbook on Transparency, edited by Padideh Ala'i and Robert G. Vaughn, 346–67. Cheltenham: Edward Elgar Publishing. https://bit.ly/3BpT2LX

ICAP.
2021. "Emissions Trading Worldwide: Status Report 2021." Berlin: International Carbon Action Partnership (ICAP). https://bit.ly/3sFwkLY

Intergovernmental Panel on Climate Change (IPCC).
2015. Climate Change 2014: Mitigation of Climate Change. Working Group III Contribution to the IPCC Fifth Assessment Report. Cambridge: Cambridge University Press.

Interpol.
2013. "Guide to Carbon Trading Crime." Lyon: International Crime Policy Organisation. https://bit.ly/3Jy9tIW

ISDA.
2021. "Legal Implications of Voluntary Carbon Credits." New York, NY: International Swaps and Derivatives Association, Inc. https://bit.ly/3LDEHQT

Jagers, Sverker C., and Johannes Stripple.
2003. "Climate Governance Beyond the State." Global Governance 9 (3): 385–99.

Kaufmann, Daniel, Aart Kraay, and Massimo Mastruzzi.
2010. "The Worldwide Governance Indicators: Methodology and Analytical Issues." World Bank Policy Research Paper No. 5430. Washington, DC: World Bank. https://papers.ssrn.com/abstract=1682130.

Kazakhstan.
2007. "Environmental Code of the Republic of Kazakhstan. Code of the Republic of Kazakhstan Dated 9 January 2007, No.212." http://adilet.zan.kz/eng/docs/K070000212_.

Keyzer, Patrick, Damien Lockie, John Farrar, Michael Weir, Tina Hunter, and Richard Hundt.
2012. "Carbon Market Integrity: Integrity and Oversight of the European Emissions Trading System." Melbourne: Carbon Market Institute (CMI). www.carbonmarketinstitute.org.

Klenert, David, Linus Mattauch, Emmanuel Combet, Ottmar Edenhofer, Cameron Hepburn, Ryan Rafaty, and Nicholas Stern.
2018. "Making Carbon Pricing Work for Citizens." Nature Climate Change 8 (8): 669–77. https://doi.org/10.1038/s41558-018-0201-2.

Kogels, Han.
2010. "VAT Fraud with Emission Allowances Trading." EC Tax Review 19 (5): 186–87.

Kraay, Aart, Pablo Zoido-Lobaton, and Daniel Kaufmann.
1999. Governance Matters. Policy Research Working Papers. Washington, DC: The World Bank. https://doi.org/10.1596/1813-9450-2196.

Lasswell, Harold Dwight.
1971. A Pre-View of Policy Sciences. New York, NY: American Elsevier Publishing Company.

Lemoine, Joseph.
2018. "Global Indicators of Regulatory Governance: Worldwide Practices of Regulatory Impact Assessments." Washington, DC: World Bank. https://bit.ly/3uRg4dy

Levi, Sebastian, Christian Flachsland, and Michael Jakob.
2020. "Political Economy Determinants of Carbon Pricing." Global Environmental Politics 20 (2): 128–56. https://doi.org/10.1162/glep_a_00549.

Liu, Jiefei, and Stian Reklev.
2021. "China Carbon Futures Trading Likely to Go Ahead after Government Nod." Carbon Pulse, November 8, 2021. https://carbon-pulse.com/143433/.

Markussen, Peter, and Gert Tinggaard Svendsen.
2005. "Industry Lobbying and the Political Economy of GHG Trade in the European Union." Energy Policy 33 (2): 245–55. https://bit.ly/3oTMGzn

Meadowcroft, James.
2009. "Climate Change Governance." Policy Research Working Paper 4941. Washington, DC: World Bank. https://bit.ly/3uUK8EY

Meckling, Jonas.
2011. Carbon Coalitions: Business, Climate Politics, and the Rise of Emissions Trading. Cambridge, MA: MIT Press. https://bit.ly/3LFJ4La

MEE.
2020. "Measures for the Administration of Carbon Emissions Trading (Trial Period)." Index No. 000014672/2021-00004. Beijing: Ministry of Ecology and Environment (MEE). https://bit.ly/3gScg3o

Monast, Jonas, Jon Anda, and Timothy H. Profeta.
2009. "U.S. Carbon Market Design: Regulating Emission Allowances as Financial Instruments." Working Paper CCPP 09-01. Durham, NC: Nicholas Institute for Environmental Policy Solutions. https://bit.ly/34Y31Mr

Moon, M. Jae, Eric W. Welch, and Wilson. Wong.
2005. "What Drives Global E-Governance? An Exploratory Study at a Macro Level." In Proceedings of the 38th Annual Hawaii International Conference on System Sciences, 131–131. https://doi.org/10.1109/HICSS.2005.688.

Munnings, Clayton, Richard D. Morgenstern, Zhongmin Wang, and Xu Liu.
2016. "Assessing the Design of Three Carbon Trading Pilot Programs in China." Energy Policy 96 (September): 688–99. https://doi.org/10.1016/j.enpol.2016.06.015.

Newell, Peter, Nicky Jenner, and Lucy Baker.
2009. "Governing Clean Development: A Framework for Analysis." Development Policy Review 27 (6): 717–39. https://bit.ly/3GVnejo

Nield, Katherine, and Ricardo Pereira.
2016. "Financial Crimes in the European Carbon Markets." In Research Handbook on Emissions Trading, edited by Stefan E. Weishaar, 195–231. Cheltenham: Edward Elgar.

Nordhaus, William.
2005. "Life After Kyoto: Alternative Approaches to Global Warming." Working Paper 11889. National Bureau of Economic Research. https://doi.org/10.3386/w11889.

Nova Scotia.
2017. "What We Heard: Nova Scotia Cap and Trade Design Options." Halifax Regional Municipality, NS: Province of Nova Scotia. https://bit.ly/3h6Utpz

Offe, Claus.
2009. "Governance: An 'Empty Signifier'?" Constellations 16 (4): 550–62. https://bit.ly/3uQZURh

Organisation for Economic Co-operation and Development (OECD).
2009. "Regulatory Impact Analysis: A Tool for Policy Coherence." Text. Paris: OECD Publishing. https://bit.ly/3uVdhjE

PMR.
2019. "Designing Accreditation and Verification Systems: A Guide to Ensuring Credibility for Carbon Pricing Instruments." Washington, DC: World Bank Partnership for Market Readiness (PMR).

———. 2021. "A Guide to Developing Domestic Carbon Crediting Mechanisms." Washington, DC: World Bank. https://bit.ly/3GTkfI4

PMR and CPLC.
2018. "Guide to Communicating Carbon Pricing." Washington, DC: World Bank and Carbon Pricing Leadership Coalition (CPLC). https://openknowledge.worldbank.org/handle/10986/30921.

PMR and FCPF.
2016. "Emissions Trading Registries: Guidance on Regulation, Development and Administration." Working Paper. Washington, DC: World Bank Partnership for Market Readiness (PMR) and Forest Carbon Partnership Facility (FCPF). https://doi.org/10.1596/25142.

PMR and ICAP.
2021. Emissions Trading in Practice: A Handbook on Design and Implementation. 2nd ed. Washington DC: World Bank Partnership for Market Readiness (PMR) and International Carbon Action Partnership (ICAP) (forthcoming).

Radaelli, Claudio M., and Fabrizio de Francesco.
2010. "Regulatory Impact Assessment." In The Oxford Handbook of Regulation, edited by Robert Baldwin, Martin Cave, and Martin Lodge, 279–301. Oxford: Oxford University Press. https://bit.ly/3GOkW5n

Rafaty, Ryan.
2018. "Perceptions of Corruption, Political Distrust, and the Weakening of Climate Policy." Global Environmental Politics 18 (3): 106–29. https://doi.org/10.1162/glep_a_00471.

Reklev, Stian.
2021. "China Takes Step towards Carbon Futures Exchange." Carbon Pulse, January 25, 2021. https://carbon-pulse.com/119833.

Rosenau, James N.
1995. "Governance in the Twenty-First Century." Global Governance 1 (1): 13–43.

Santikarn, Marisa, Lina Li, Stephanie La Hoz Theuer, and Constanze Haug.
2018. "A Guide to Linking Emissions Trading Systems." Berlin: International Carbon Action Partnership (ICAP). https://bit.ly/3sL9F0P

Schauer, Frederick.
2011. "Transparency in Three Dimensions." University of Illinois Law Review 2011 (4): 1339–58.

Shen, Peiyao, Regina Betz, Andreas Ortmann, and Rukai Gong.
2020. "Improving Truthful Reporting of Polluting Firms by Rotating Inspectors: Experimental Evidence from a Bribery Game." Environmental & Resource Economics 76 (2): 201–33. https://doi.org/10.1007/s10640-020-00417-0.

Smith, E. Keith, and Adam Mayer.
2018. "A Social Trap for the Climate? Collective Action, Trust and Climate Change Risk Perception in 35 Countries." Global Environmental Change 49 (March): 140–53. https://doi.org/10.1016/j.gloenvcha.2018.02.014.

Stavins, Robert N.
1995. "Transaction Costs and Tradeable Permits." Journal of Environmental Economics and Management 29 (2): 133–48. https://doi.org/10.1006/jeem.1995.1036.

Stiglitz, Joseph E.
2012. "Government Failure vs. Market Failure: Principles of Regulation." In Government and Markets: Toward a New Theory of Regulation, edited by Edward J. Balleisen and David A. Moss, 13–51. Cambridge: Cambridge University Press. https://bit.ly/36iW3lY

Supreme Court of Canada.
2021. "References Re Greenhouse Gas Pollution Pricing Act, 2021 SCC 11, Case Numbers 38663, 38781, 39116." https://bit.ly/3JwJXDV

Tokyo.
2000. "Environmental Ordinance for Ensuring the Health and Safety of Tokyo Residents (Environmental Security Ordinance)." https://bit.ly/3HUod4t

United Nations.
2015. "Transforming Our World: The 2030 Agenda for Sustainable Development. Resolution Adopted by the General Assembly on 25 September 2015 (A/RES/70/1)." United Nations. https://bit.ly/3h6UQjX

Vieweg, Marion, Claudia Doets, Marta Torres, Sina Wartmann, Padraig Oliver, Deniz Yener, Edgar Cruz, Edwin Dalenoord, and Nuria Valero Esteban.
2009. "Linking Developing Countries to Carbon Markets: Cost Assessment of Capacity Building Requirements." London: Ecofys.

Viscusi, Kip C., and Ted Gayer.
2015. "Behavioral Public Choice: The Behavioral Paradox of Government Policy." Harvard Journal of Law & Public Policy 38 (3): 973–1007.

Whitesell, William C., and Stacey L. Davis.
2008. "Preventing Market Disruptions in Cap-and-Trade Programs." Washington, DC: Center for Clean Air Policy (CCAP). https://bit.ly/3oO5dxd

Willems, Stéphane, and Kevin A. Baumert.
2003. "Institutional Capacity and Climate Actions." COM/ENV/EPOC/IEA/SLT(2003)5. Paris: OECD. https://bit.ly/3rSNiHt

World Bank.
1992. "Governance and Development." Washington, DC: World Bank. https://bit.ly/3BtpPzN

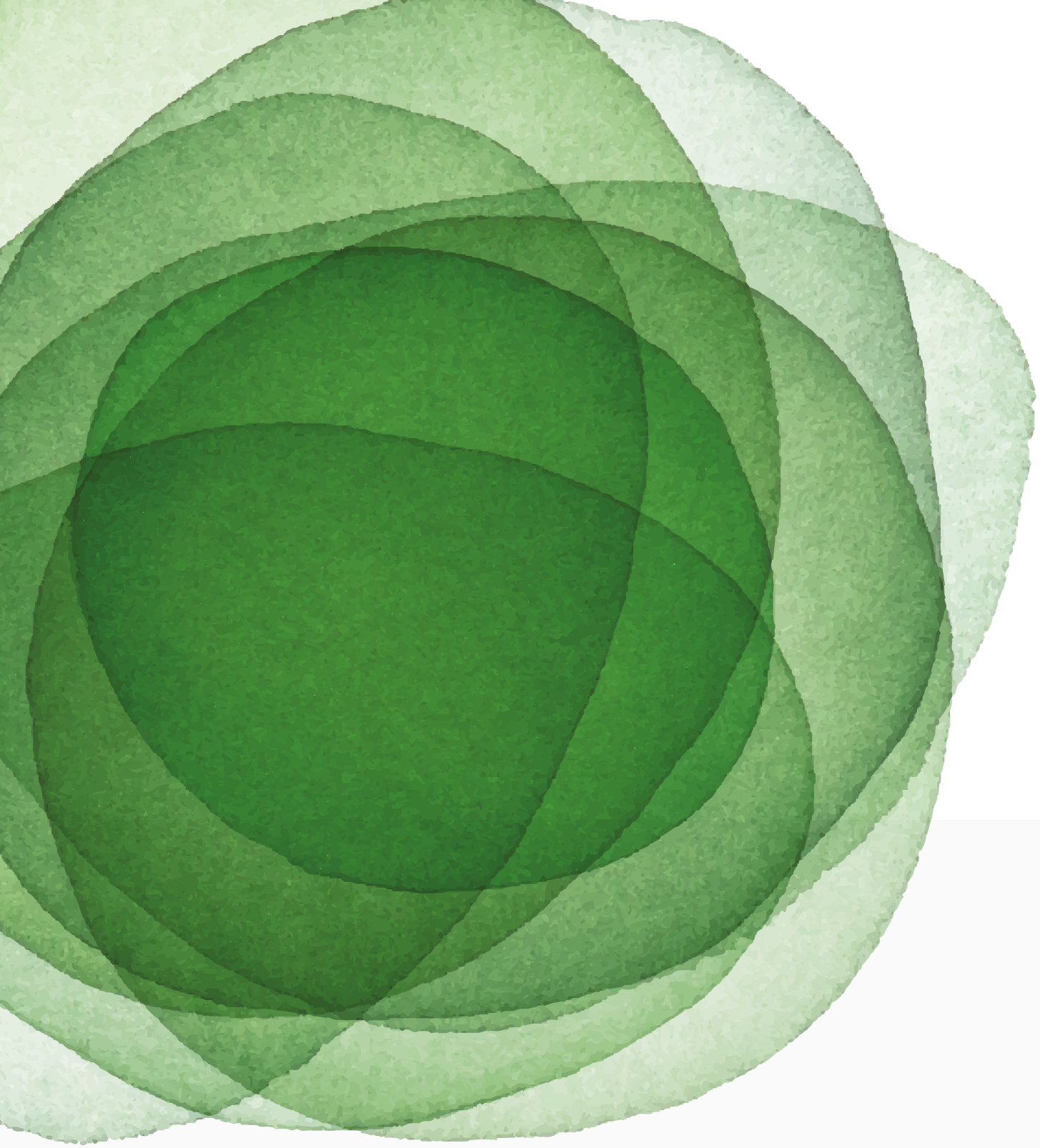
———. 2017. World Development Report 2017: Governance and the Law. World Development Report. Washington, DC: The World Bank. https://doi.org/10.1596/978-1-4648-0950-7.

———. 2021a. "Carbon Pricing Assessment and Decision-Making: A Guide to Adopting a Carbon Price." Washington, DC: World Bank. https://openknowledge.worldbank.org/handle/10986/35387.

———. 2021b. State and Trends of Carbon Pricing 2021. Washington, DC: World Bank. https://doi.org/10.1596/978-1-4648-1728-1.

List of Abbreviations

AGE	Arbeitsgruppe Emissionshandel zur Bekämpfung des Treibhauseffektes
APA	Administrative Procedure Act
AVR	Accreditation and Verification Regulation
BMU	German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety
BVerwG	Bundesverwaltungsgericht
CAISO	California Independent System Operator
CARB	California Air Resources Board
CBA	Cost-benefit Analysis
CDM	Clean Development Mechanism
CFTC	U.S. Commodity Futures Trading Commission
CLOB	Central Limit Order Book
CMA	Conference of the Parties to the United Nations Framework Convention on Climate Change serving as the Meeting of the Parties to the Paris Agreement
CME	Chicago Mercantile Exchange
CORSIA	Carbon Offsetting and Reduction Scheme for International Aviation
CPLC	Carbon Pricing Leadership Coalition
CSRC	China Securities Regulatory Commission
DEHSt	German Emissions Trading Authority
DFP	Designated Focal Point
DNA	Designated National Authority
ECJ	European Court of Justice
EEX	European Energy Exchange
EPA	U.S. Environmental Protection Agency
ESMA	European Securities and Markets Authority
ETF	Enhanced Transparency Framework
ETS	Emissions trading system
EU	European Union
EUA	EU Allowance
EU ETS	European Union Emissions Trading System
FCPF	Forest Carbon Partnership Facility
FERC	U.S. Federal Energy Regulatory Commission
GHG	Greenhouse gas
GHGRP	U.S. Greenhouse Gas Reporting Program
IASB	International Accounting Standards Board
ICAO	International Civil Aviation Organization
ICAP	International Carbon Action Partnership
ICE	Intercontinental Exchange
IPCC	Intergovernmental Panel on Climate Change
ISDA	International Swaps and Derivatives Association
ISO	International Organization for Standardization
ITMO	Internationally Transferred Mitigation Outcome
JI	Joint Implementation
KYC	Know-your-Customer
MRV	Monitoring, reporting, and verification
MRR	EU Monitoring and Reporting Regulation
MSR	Market Stability Reserve
MEE	Chinese Ministry of Ecology and Environment
NDC	Nationally Determined Contribution
NZ ETS	New Zealand Emissions Trading Scheme
NGO	Non-governmental organisation
OECD	Organisation for Economic Co-operation and Development
OPR	Offset Project Registry
OTC	Over-the-Counter
PBL	Netherlands Environmental Assessment Agency
PMI	Partnership for Market Implementation
PMR	Partnership for Market Readiness
PPP	Public-Private Partnership
RGGI	Regional Greenhouse Gas Initiative
RIA	Regulatory Impact Assessment
SDG	Sustainable Development Goal
SOE	State-owned enterprise
TMG	Tokyo Metropolitan Government
UBA	Umweltbundesamt
UK	United Kingdom
UNFCCC	United Nations Framework Convention on Climate Change
VAT	Value-added tax
WCI	Western Climate Initiative



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