

Chapter 11

Capacity Development Associated with the Implementation of Emissions Trading System in Mexico



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Abstract The creation of an emissions trading system in Mexico as response to international policy on climate change forces the government and corporations to create new activities and responsibilities to address this issue. It is also important to know who will be the decision-maker and who is in charge of the institutional work (representation and negotiation). The main objective of this chapter is to point out who the stakeholders involved in the design, implementation, evaluation and transparency of the system are, or should be, according to the national regulatory framework and international summons. We shall also analyze the mechanics and information provided by the system and how it helps to make environmental policy, which helps to reduce emissions. Finally, we will also analyze whether it also helps to establish strategic alliances and international agreements toward common objectives and priorities. The chapter approaches the topic based on capacity development theory, which focuses on improving governance among different levels and stakeholders: government, companies, civil organizations, and scientists. We emphasize the potential of training spaces as a place for transformation and developing a learning framework whose own relevance relies on the focus of emergent strategies, which ensure the environmental integrity and conditions for the country's competence in the international context. This chapter contributes to existing literature about the understanding of executing such a system, the stakeholders involved at the national level, and their potential to create international networks.

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Introduction

This chapter is divided into six parts. The first, the introduction, raises awareness of the topic and of the approach used in this analysis. The second talks about international environmental governance, offering a general picture of how international organizations work and how they influence national policy. The section concludes with an example regarding climate change. The third section includes a review of national environmental governance and how it is addressed in the regulatory framework of climate change, using the emissions trading system as an example. The fourth discusses corporate governance and how it helps to plan, guide, execute, and control businesses in order to hold them accountable to environmental policy, specifically the emissions trading system. The fifth section contains a proposal of methodology. We focus on capacity development in order to draw a results analysis and conclusions where we discuss the basic conditions and priorities that stakeholders ought to take into account in order to successfully execute each phase in the emissions trading system.

There is no agreement among researchers about what governance means. There are several different definitions. Generally speaking, we say that governance is the decision-making process undergone by governmental and non-governmental actors in solving a specific problem (Aguilar 2009; Cerrillo Martínez 2005; Denhardt and Denhardt 2007; Georgiadou and Reckien 2018; Kooiman et al. 2008; Martínez Rodríguez 2015; Marsh 2008; Pierre 2000; Treviño Cantú 2011; Whittingham 2010; Zurbruggen 2011). In the international context, the alliance of different countries and their interests in regard to the issue of climate change interact with each other, providing a frame of reference in which each country voluntarily adopts or rejects the decision, in an ostensibly diplomatic approach.

National governance is how the government includes the different actors involved in decision-making, policy design, implementation, and assessment, and their instruments. Meanwhile, corporate governance is the interaction between companies and their environment, the articulation of their organizations and the new regulatory frameworks, seeking above all to ensure profitability and competitiveness, under a framework of transparency and respect for the environment.

Capacity Building (CB) was a core concept in development, justice, and welfare policies through the 1990s. This approach intended to develop or increase knowledge, output rate, management, skills, and other capabilities from the ground up according to a pre-imposed design. However, it did not acknowledge pre-existing capacities among people or institutions. Inspired by the launch of the Millennium Development Goals (MDGs) and the Paris Declaration on Aid Effectiveness in 2005, there was a shift to a new concept, that of capacity development. This concept is a broader in its approach. It acknowledges pre-existing capacities and knowledge. Operators

make a diagnosis in order to identify which areas need their capacities strengthened. Thus, the aid is designed according to the actual requirements using an endogenous process. This approach later became the trend (Greijn et al. 2015; OCDE 2008; Robeyns 2016; Zamfir 2017).

The capacity development approach goes further than a social aid policy. It has evolved to other areas of sustainable development such as industry, energy, climate change, and health and security. It also drives endogenous innovation as it uses global knowledge to find proper solutions for specific local contexts (Greijn et al. 2015; OCDE 2008; Zamfir 2017).

The capabilities approach postulated by Amartya Sen and Martha Nussbaum, among others, adds further insight into capacity development. According to Sen, life is a set of interrelated beings and activities, where capabilities are functional vectors that reflect the freedom to live one type of life or another (1993). In economic terms, this is an alternative approach to the welfare economy with a wider perspective where the society's local empowerment is an unnegotiable strategy for sustainable development and social transformation. This is what the world needs in order to face climate change.

Since the capabilities approach focuses on the extent of real opportunity that people have to accomplish what they value through agency (existence of institutions, democracy, literacy, low levels of poverty, governance) and the set of capabilities at their disposal, it provides an ethical framework for evaluating the achievement of capacity development and how it is obtained.

In this analysis, we use Porter's (2007) definition of capacity development as "the emergent combination of attributes, capabilities and relationships that enables a system to exist, adapt and perform in a manner which expands the real freedoms that people enjoy" (p. 19). This approach is useful for weighing opportunities, challenges, and strategies for the emission trading system in Mexico.

The emissions trading system is a market-based instrument with international compliance to reduce greenhouse gas emissions which cause climate change, a problem that impacts the whole of humanity. Mexico is taking the first steps in order to adopt this trading system by collecting international knowledge and experience.

International Environmental Governance

The norms, rules, and procedures for international cooperation take shape according to ecological interdependencies that are clearly cross-border. When we talk about environmental issues, we must be aware that they are not contained by political boundaries. Environmental issues are borderless and international organizations attempt to address them. Climate change is undoubtedly the most typical of global environmental problems, where there is no solution without international cooperation. (Delbeke and Vis 2019).

International organizations help to process the sum total of knowledge and information. Additionally, they help by providing and setting up institutions for the

progressive establishment and implementation of norms and rules within national regimes (Bauer et al. 2006).

How can international organizations influence national governments? International bodies are supposed to influence the behavior of national political actors by changing their knowledge and belief system. They also attempt to influence political processes by creating, supporting, and establishing norm-building processes, rules and procedures for specific international cooperation problems. These organizations are crucial actors in developing inter- and transnational negotiations and discussions on specific issues (Bauer et al. 2006).

However, the influence of international organizations depends on the strength of the national government. In a first instance, being part of these bodies is completely voluntary and the guidelines that these organizations issue are non-binding recommendations. Though, in some cases this depends on the type of regulatory framework developed by international organizations as well as common practice and other sources of international law.

In addition to the above, within these bodies there is a focus on decision-making carried out by consensus of the participating countries (known as the parties). When it comes to environmental issues, strength lies in the technical base. The climate change phenomenon implies taking divergent actions, which have a great impact on traditional economies. The recommendations issued by international organizations are complex and politically controversial.

One of the international organizations created by the United Nations is the United Nations Framework Convention on Climate Change (UNFCCC). The UNFCCC provides a global response to the threat of climate change. Mexico has been party to the UNFCCC since 1992. In 1993, after the ratification act, Mexico stated at the international level its consent to be bound by the guidelines established in this instrument.

There are two UNFCCC meetings that marked the path for international climate change policy. One is the Third Conference of the Parties (CoP3) in 1997, where the Kyoto Protocol was adopted. The Kyoto Protocol was an instrument with specific quantitative goals for reducing Greenhouse Gases (GHGs). It was ratified by Mexico in 2000, and officially came into force on 16 February 2005. The other important meeting is CoP21 in Paris, France, where the Paris Agreement on climate change was approved. This agreement entered into force on 4 November 2016 and has been applicable since 2020. The agreement aims to limit the global average temperature rise to below 2 °C, relative to pre-industrial levels and to continue efforts to limit this increase to 1.5 °C in order to reduce risks and effects of climate change while at the same time strengthening countries' capacity to face the impacts. This is, without a doubt, the most important voluntary commitment that has been made in recent years in the field of climate change (National Institute of Ecology and Climate Change 2018).

The fundamental difference between the Paris Agreement and the Kyoto Protocol is that the former embraces “voluntary” commitments from developed and developing countries, replacing the top-down scheme with the bottom-up one. Hence, a legal regime based on the “principle of common but differentiated responsibilities”

is not enough. Something deeper is required: structural changes to economic systems tied to behavioral and value changes (Ibarra 2019).

National Environmental Governance

Below we mention the instruments at the national level that have been developed for the building an emissions trading system in Mexico. This represents an essential step in the process of updating national climate change policy. Mexico's climate change policy reflects the commitment of the Mexican government to reducing greenhouse gases and compound emissions by promoting sustainable development based on a competitive and low-emission economy, while also adapting new strategies. This requires a responsible, coordinated, and continuous effort at the three levels of government, as well as the activation of citizen participation mechanisms and of the sectors involved in the implementation and evaluation of the performance of mitigation and adaptation actions.

Mexico's Regulatory Framework on Climate Change is

- The Political Constitution of the United Mexican States (CPEUM): Article 4 establishes that Everyone has the right to a healthy environment for their development and well-being. The State will guarantee respect for this right.
- General Law of Ecological Balance and Protection of the Environment (LGEEPA): Aims to promote sustainable development and establish bases for guaranteeing Mexicans the right to live in a healthy environment. Article 5 establishes that the federal government is empowered to formulate and execute mitigation and adaptation actions in regards to climate change.
- General Law on Climate Change (LGCC): Aims to regulate compounds and emissions of greenhouse gases in order to stabilize their concentrations in the atmosphere to a level that prevents dangerous anthropogenic interference in the climate system; regulate mitigation actions; as well as promote a transition toward a competitive, sustainable and low-carbon economy.

Policy Instruments

The following two policy instruments are derived from the General Law on Climate Change (LGCC):

- National Registry of Emissions (and its Regulations)
- Emissions Trading System.

National Registry of Emissions

The General Law on Climate Change (LGCC) was published on 6 June 2012 and entered into force in October of the same year. This made Mexico the first developing country to issue a law on the matter. The LGCC dictates the creation of multiple public policy instruments, including the National Emissions Registry (RENE) and its Regulations (RLGCCMRENE, 28 Oct 2014). Both make it possible to compile the necessary information on the emission of compounds and greenhouse gases (CyGEI), such as carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), black carbon (CN), and various fluorinated compounds from the different productive sectors across the country (established by Art. 87 and 88 of the LGCC, as well as the 6th and 9th articles of LGCC Regulations regarding RENE).

This regulation establishes the creation of agreements that will define the technical aspects for the registry's operation. One of these agreements, the Agreement on the Grouping of Gases and Greenhouse Compounds and their Global Warming Potential, identifies each one of the chemical substances according to an internationally accepted norm defined by associations specializing in the field. Also, it considers the formula and chemical family to which the substance belongs, as well as its global warming potential. This is consistent with what was published in the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC).

The National Emissions Registry (RENE) is a policy instrument that will make it possible to compile the necessary information regarding CyGEI emissions from the different productive sectors across the country so they are traceable, and trends can be evaluated in order to make national emission reduction strategies. Keeping an emissions registry will allow companies and industries to identify their emission sources with the aim of reducing their carbon footprint, while generating opportunities for business and competitiveness along the way.

RENE has two main objectives:

1. To collect information on:
 - (a) Direct emissions derived from the combustion of fixed and mobile sources;
 - (b) Emissions derived from reactions in industrial processes;
 - (c) Indirect emissions derived from the consumption of purchased electrical or thermal energy.
2. To integrate the registry about CyGEI emission reductions and mitigation projects implemented in national territory and promoted by either individuals or companies.

Emissions Trading System

The General Law on Climate Change was amended on 13 July 2018 to incorporate the international commitments acquired by Mexico in the Paris Agreement and the

Intended Nationally Determined Contributions, which commits Mexico to unconditionally reduce its greenhouse gas emissions by 22% and black carbon emissions by 51% from the baseline by 2030.

The Agreement establishing the preliminary bases of the Emissions Trading System Program was published in the Official Gazette of the Federation (DOF) dated 01/10/2019. This is a market instrument designed to reduce greenhouse gas emissions based on the cap-and-trade principle, where the government imposes a ceiling or cap on total emissions from one or more sectors of the economy. Its legal basis is found at the national level, in Article 7, section IX of the General Law on Climate Change, which attributes the power to create, authorize, and regulate emissions trading to the Federation. In accordance with the provisions of the fourth paragraph of article 92 of the same law, this constitutes an economic market instrument. Article 94 of the General Law itself authorizes the Ministry of Environment and Natural Resources (SEMARNAT), in participation and consensus with the Commission, the Council and representation of the participating sectors, to establish the system progressively and gradually.

The aim of the Emissions Trading System is to promote emission reductions that can be carried out at the lowest possible cost, in a measurable, reportable and verifiable manner, without compromising the competitiveness of the participating sectors in international markets.

The ETS is comprised of two phases, an initial phase to let the actors involved learn how an emissions market behaves. For this purpose, the General Law on Climate Change calls for the development of a pilot program. The transition phase and the proper operational phase of the system will come into effect at the end of the transition stage of the pilot program (DOF 01/10/2019).

In accordance with Article Six of the Agreement (DOF 01/10/2019), the ETS pilot program pursues the following objectives: to make progress in the reduction of emissions, promote them, test the operation of the ETS, identify areas of opportunity, generate information, become familiar with its operation, and develop capacities in terms of emissions trading.

In accordance with the Agreement (DOF 01/10/2019), the ETS pilot program consists of the information reported in RENE by the participants, the allowance ceiling, the monitoring system, market transactions, and the flexible compliance mechanisms.

Article Six of the Agreement (DOF 01/10/2019) also stipulates that the pilot program will last thirty-six months, starting on 1 January 2020 and ending on 31 January 2022.

The pilot program is divided into two periods:

- I. The period from 1 January 2020 to 31 December 2021 is part of the pilot phase of the pilot program, and
- II. The period from 1 January 2022 to 31 December of the same year will constitute the transition phase of the pilot program to the ETS' operational phase.

The pilot program will have no economic effects, which means that there will be no monetary penalties and the allocation of allowances will be free in a proportion equivalent to the participants' emissions, regardless of the allowances that are destined to the corresponding reserves.

It could be said that the RENE contains the ETS. The RENE holds the national registry of emissions of all gases provided for in the General Law on Climate Change from all industries. Therefore, it is necessary to have a reliable institution such as the RENE and the commitment of the industries with compulsory reporting, which must have adequate knowledge for participation and proper declaration of their emissions. Both the RENE and ETS come under the jurisdiction of SEMARNAT.

Corporate Governance

Climate change poses many challenges for companies, among them is the fulfillment of a series of increasingly rigorous requirements by environmental authorities. One example of this is the implementation of the Emissions Trading System (ETS). It is necessary to evaluate the capabilities of companies to meet the requirements so that an ETS may be implemented (Durant s/a).

The ETS is a market-based public policy instrument to control pollution by providing an economic incentive to reduce CO₂ emissions. To be successful in managing such a cap-and-trade system, companies need strategic, technical and financial skills.

Competitive advantage, reputation, image, the ability to attract and retain markets, and the different relationships companies have with their environment, depend on environmental compliance. Through carbon trading and management and new, GHG emission-reducing technologies, the new markets are based on reducing environmental impact.

Using data from the National Emissions Registry (RENE), we see that facilities in the energy and industry sectors reporting annual direct emission of 100,000 tons or more of carbon dioxide constitute the primary source of direct Greenhouse Gas (GHG) emissions. Thus, they will be the first included in the ETS.

Only carbon dioxide emissions will be considered in the ETS's pilot phase, since it is the most emitted greenhouse gas nationwide, making it an effective indicator before moving into the system's operational phase.

The different sectors and subsectors that must compulsorily report their direct and indirect emissions of compounds or greenhouse gases from all their facilities when they exceed 25,000 tCO_{2e} (tons of CO₂ equivalent) are indicated in Table 11.1.

SEMARNAT has an electronic reporting platform called COA Web for reporting and compiling emissions registered by RENE. This platform provides for multiple fields required for recording direct and indirect emissions based on the activities carried out by the business. Facilities subject to emissions reporting must therefore have the necessary data on hand in order to fill in the corresponding fields.

Compulsory reporters:

Table 11.1 Sectors and subsectors with compulsory reporting according to RENE regulations

Sectors	Subsectors
Energy	Generation, electricity transmission, and distribution Exploitation, production, transport, and distribution of hydrocarbons
Industry	Chemical industry Iron and steel Metallurgy Metal-mechanic Mining Automotive Cellulose and paper Graphic arts Petrochemicals Cement and lime Glass Electronics Electricity Food and beverage Lumber Textiles
Transportation	Air Rail Marine Ground
Agricultural and cattle raising	Agriculture Cattle raising
Waste	Sewage water Urban solid waste and special handling waste, including final disposal
Services and commerce	Construction, commerce, educational services, recreational and entertainment activities, tourism, medical services, government and financial services

1. Identify emission sources (fixed and mobile)
2. Collect the necessary data in order to apply the corresponding calculation methodologies
3. Measure, calculate, or estimate their direct and indirect emissions according to each activity carried out at the facility, applying the corresponding calculation methodology
4. Add direct and indirect emissions
5. Verify the information reported through the corresponding verification bodies
6. Report emissions annually using the annual operating certificate (COA).

The verification report is the document issued by an accrediting body that verifies the relevance, integrity, consistency, transparency, and accuracy of the information contained in the emission reports that facilities in industries with compulsory reporting must supply to RENE.

Another issue that companies have to work on is registering mitigation projects. Mitigation projects are validated by international organizations such as Climate Action Reserve, Verified Carbon Standard, Gold Standard, Plan Vivo, American Carbon Registry, The Climate, Community and Biodiversity Standards, and by Mexican national organizations (SEMARNAT) in order to guarantee transparency.

In the European Union's experience, companies commented that starting slowly gave both public and private actors the opportunity to learn how to approach issues in practice (Delbeke and Vis 2019).

Capacity Development for the Emissions Trading System in Mexico

The capabilities approach, used in this paper, is a relatively young theory in the field of social sciences. It is based on identifying and using the endogenous resources and potentials of a country or community. According to this perspective, development is defined as a process of transformation of the society, aimed at overcoming existing difficulties and challenges. It also states the importance of social capital and cooperation links with external agents to attract human, monetary and technical resources that contribute to development, in this case, a socioeconomic development limited by greenhouse gas emissions.

Thus, we will use the capabilities approach as a methodological framework for the design of governmental and non-governmental policies for the development of the country (Robeyns 2016).

The concept of "capacity building" through the UNDP document: Rethinking Technical Cooperation (1993), the OCDE report: Shaping the 21st Century: The Contribution of Development Co-operation (1996) and the UNDP report: Capacity Assessment and Development in a Systems and Strategic Management Context (1998) evolved and was criticized because its results were allegedly insufficient, did not strengthen local capacities and did not make a long-lived change. Then, the concept of "capacity development" emerged as a trend after the adoption, in 2000, of the UN Millennium Development Goals and the 2005 Paris Declaration on Aid Effectiveness. Additionally, the 2008 Accra Agenda for Action provided guidelines for systematically identifying areas where it is necessary to strengthen capacities. The document *The Challenge of Capacity Development. Working Towards Good Practice* (OECD 2008) defined the most accepted and used concept of "capacity development"; Zamfir (2017) mentions the different international organizations that also define the concept of "capacity development" (UNDP, World Bank, UNECA, USAID, FAO).

The current international development agendas (Sustainable Development Goals 2015) have been expanded to regionally and internationally address: climate change, health, and safety. Taken holistically, "capacity development" is considered the key

driver of sustainable development, providing the global flow of knowledge and experience through financial support, non-financial support such as cooperation, and public–private partnership strategies (Greijn et al. 2015).

The first step is to carry out a capacity assessment where the internal (personal) and external conditions (for example, regulatory frameworks) are identified as well as prioritize the actions that must be taken to develop these capacities. Which policies are necessary, and which can be implemented at local, state, federal, and international levels? Based on the analysis of the available documentary information.

To acknowledge this, we came up with a table divided into diagnosis or baseline and the opportunity areas where we need to build capacities in the government and private sectors Table 11.2.

The academic sector also participates as a guest on the ETS Advisory Committee, based on Article forty-seventh of the Agreement (01/10/2019). However, researchers are needed to work on the Emissions Trading Systems, emissions markets and what they imply, researchers are also needed in green finance, international environmental trade. It should be noted that researchers are not only needed to work in these areas, but also in the academic sector so human capital can be developed along these lines of research to cover all the needs of both the government and private sectors.

The drafting of curricula for careers should address climate change in general, but with specialties available in emissions finance, new technologies for emission mitigation, and government innovation for policymaking of instruments to incentivize the domestic market and make it competitive. In general, more specialized human resources are required.

Civil organizations along with academia participate in the integration of the Committee, but are required to demonstrate knowledge about Emissions Trading Systems. However, it is also important to add knowledge of how emissions impact society and how an ETS would improve the well-being of society, particularly its health. Not to mention how it contributes to creating or eliminating jobs and how the obsolete technology is going to be disposed. Further, how companies are going to carry out their reconversion and what it is going to be the impact of that conversion on populations. We agree the knowledge about ETSs is important, however, again we refer to participation of citizens with an interdisciplinary focus and training on both the technical and social basis. They must be committed to the interest of national society and not only the interests of their own respective subsidiaries.

Analysis of Results and Conclusions

In order to comply with international and national agreements on climate change, governance in its broad sense is required: one that goes beyond a limited perspective focused on the allocation of power and the management and administration of resources. Environmental governance implies the representation of multiple and diverse actors with different interests, who, together, both vertically (global, regional, national, and local) and horizontally (government, society, companies, organizations,

Table 11.2 Development of capacities

Diagnosis	Government sector's necessities	Private sector's necessities
Mexico's participation in international environmental organizations	Trained personnel, both technically and diplomatically at SEMARNAT, capable of influencing technical negotiations at international level, considering the national context	Designated staff to collaborate with SEMARNAT and provide information about their sector to assist in international negotiations
Implementation of international protocols and agreements. There is a robust regulatory framework and policy instruments	Designate staff to monitor, evaluate, update, and interact with stakeholders. That observes both international and national movements, to avoid the obsolescence of the regulatory framework and its instruments Implementation of a continuously improving system Work on the involvement of all stakeholders on the public policy process	Personnel trained in design, implementation and evaluation of public policies and their instruments, both technically and in government activities, so they participate actively Representatives of sector's chambers that are sensitive to international and national changes Work on the collection of information that serves as input for the design of public policies
There is a National Registry of Emissions and a COA-WEB	Ensure the robustness of the system, with high-capacity equipment and competent personnel in charge of its information management Update the system based on user needs Staff and organizations specialized in emissions control, validation and verification, in emission calculation methodologies, RENE surveillance and that possess in-depth knowledge of COA-WEB management Trainers for the users with the ability to detect their needs	Computer-trained staff Have the infrastructure that allows the proper access to government platforms Personnel with great knowledge of environmental management and specialists in emissions registration Interdisciplinary teams (finance, operations, administration, etc.) Personnel with extensive knowledge on filling out the COA-WEB, methodologies for calculating emissions and using the RENE
ETS pilot program	Trainers for the sectors involved with the ETS Personnel with knowledge about the emissions market, allowances that are issued in each of the three phases of the ETS, based on the companies' emissions history and international commitments Personnel capable of setting the Emission Cap for the ETS, based on the country's emission reduction goals and international mitigation commitments	Personnel trained in: <ul style="list-style-type: none"> • Emission inventory, • Emission methodology • Emission market (caps, transactions, efficiency, business opportunities, allowances, offset instruments, auctions, etc.) • The operation of the ETS • Emission mitigation projects • Identify opportunities for emission reductions within companies • New technologies to reduce emissions • Innovation of processes in order to reduce emissions, • Innovation of mitigation projects • Emission finance Companies need to check if they have enough qualified personnel to carry out their emissions measurements and mitigation projects Check the organization's chart for who can absorb new responsibilities or create new departments or, if needed, hire another company or create a new organization

(continued)

Table 11.2 (continued)

Diagnosis	Government sector's necessities	Private sector's necessities
ETS operation	<p>Personnel with extensive knowledge about the unilateral, bilateral, multilateral and indirect links tied to ETS-Mexico</p> <p>Personnel trained in:</p> <ul style="list-style-type: none"> • Emission control and emissions audits • Methodologies for calculating emissions • Emissions market behavior (price volatility and vulnerability to fraud, speculation, stocks, risks, transactions, auctions, identification of new markets, marketing opportunities) • Set up penalties for noncompliance, financial fines and instruments to complete the regulatory obligation such as compensations for offenses • Design ETS surveillance policies • Research and development of new technologies for emission mitigation and pollution control • Supervise national emission validation and verification organisms • Supervise international organizations in the issuance of certificates to participate in mitigation projects • Evaluate trends with ETS results • Develop the traceability of the ETS • Manage ETS operation • Governmental innovation in the environmental sector (regulatory instruments) • Accountability to guarantee transparency and governance of the ETS 	<p>Personnel trained in:</p> <ul style="list-style-type: none"> • Emission control and emissions audits • Methodologies for calculating emissions • Emissions market behavior (price volatility and vulnerability to fraud, speculation, stocks, risks, transactions, auctions, identification of new markets, marketing opportunities) • Research and development of new technologies for emission mitigation and pollution control • How the ETS operates • How the regulations work and the design of the CO₂ management strategy • Technical knowledge about their industrial facilities in terms of emissions and its future potential reduction • Compensation systems • Drafting of monitoring plans • Calculation methodologies considering measurement instruments, sampling or analysis methodologies that could improve the accuracy in determining emissions

etc.), must resolve all the demands or needs so that they are best served individually and collectively toward a common good, within the framework of a common objective (Ibarra 2019).

Without a doubt, the ETS represents a national challenge. Let us begin with the government infrastructure, where we must have technological and computational strength to house the systems that make up the ETS. There must also be human resources prepared for the different national and international positions that we have described. So far in Mexico, these people have been training on the go, so it is necessary to formally prepare them in areas that we have called interdisciplinary cadres that group social sciences and technical sciences, and diplomacy and solid technical knowledge. This way, they will be capable of influencing international organizations and defend the national context and not only be spectators who accept that developed countries impose policies based on their own interests. This has an impact on the competitiveness of companies, for example, by lowering or raising the

level of a certain pollutant. We need to train and empower human resources for four sectors: the international sector, and the national public, private and social sectors.

The ETS is an adaptation of an international policy instrument and since the experience of other countries is available, Mexico can develop a better ETS. Mexico will be the first country in Central and South America to implement it. Therefore, we will be an example to our fellow countries. However, despite Mexico being the most advanced, it must also operate, change its bureaucracy through government innovation that allows us not only to issue new regulatory frameworks, but to overcome the international and national context with tailored responses and mechanisms for transparency, validation, verification, trust, operability, and flexibility. The ETS needs to be constantly innovated so in order to be compatible with the ETSs already implemented around the world. Further, it must also take advantage of the regional and geographical assets that we have and avoid obsolescence. On this matter, government innovation must have its priorities. It must create public policy instruments that help the private sector in Mexico to participate, too. If we consider the actual panorama where most companies in Mexico require development of their capacities so that they may access the ETS, starting with emissions accounting and organizational studies, a question emerges: Who will perform this new task? The profile of companies in Mexico, based on the picture of the obligated subjects, is not very encouraging. It will require a strong investment for its transformation and possible participation in the ETS. Because of this, the government and private sector have to go through this change together. The focus of the government on private initiative will be very valuable toward new regulations. As can be observed in the capacity-building chart, companies must develop interdisciplinary cadres with strategic, technical, and financial skills in emissions trading. They must also have a climate strategy with projects to execute and evaluate them administratively and financially. They, too, have to analyze national and international possibilities for linkages. The ETS requires companies to grow or lose out, since the market will generate requirements where the environmental factor, GHG emissions, certifications, will be necessary for supply chains. The self-knowledge of the companies paired up with a deep knowledge of the regulations will provide great help in detecting areas of opportunity for investment, transformation, adaptation, and innovation. The creation of inter-secretary and transversal programs between government agencies such as the Ministry of the Economy, the Ministry of Finance and Public Credit, the Ministry of Energy, and the National Institute of Ecology and Climate Change must be a priority so that the government can actually and synchronously face the challenges that environmental policy poses.

Mexico not only faces the climate change phenomenon in a physical, territorial way: the rising of sea levels and changing temperatures requires specific infrastructure, the development of new materials and the construction of a health system for new diseases brought on by climate change. Furthermore, Mexico must also face the challenge of incorporating environmental public policies into its economy, since it will be seriously affected if it does not comply with international environmental certifications for the commercialization of its products. Climate change also creates new markets, a new green economy, the carbon economy had already been discussed as a

benchmark, as a trial, but now with the implementation of the ETS, it is a necessity for countries and companies to begin to participate in that market.

The ETS brings new ways of negotiating, the creation of new markets, new rules on auctions, transactions, and compensation instruments. Further the creation of new careers, new jobs as national verification organizations rise, and maintenance of computer systems, international markets, green prosecutors, new methodologies, modeling of systems, projections of mathematical models of emissions, and market behavior are needed—everything that the “air economy” implies.

Both the government and companies must invest in infrastructure and training to prepare themselves during this first phase. Additionally, this requires overwhelming participation from academia, while government must step forward to create research incentives in this field and create new careers.

We are going through a radical change where the usual subordination of the environment to economy is going down in history. Now, the environmental end, the reduction of GHG emissions, the reduction of the impact on nature, will be what allows companies to be acknowledged in the market. The environmental certifications that companies must obtain by demonstrating innovation in their processes will be a priority. Production with the least environmental impact will be most valuable. International markets, and especially those that have already implemented ETSSs, have made great advances in environmental certifications. Both their supply chains and the final product have environmental guarantees. Here in Mexico, we must work hard, the economic sector has enjoyed great liberties and little regulation and monitoring of national compliance and that has vitiated it. Now, the challenge escalates to an international level, because if they want to continue participating in the market, they must get the work done. The government is complying with the issuance of policies and instruments in compliance with the agreements. However, there is still a great gap between designing them and implementing them, because right there is where it is necessary to team up with companies so they are aware of these guidelines and can comply with them. The ETS pilot program allows us to address this topic and know the situation in our country in practice, so government may prioritize work in this area.

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International Regulatory Framework

Convención Marco de Naciones Unidas sobre Cambio Climático. <https://unfccc.int/es>
Intergovernmental Panel on Climate Change, IPCC. <https://www.ipcc.ch/>

National Regulatory Framework

CPEUM, Constitución Política de los Estados Unidos Mexicanos. <http://www.diputados.gob.mx/LeyesBiblio/ref/cpeum.htm>
DOF, Diario Oficial de la Federación con fecha 01/10/2019. <https://www.dof.gob.mx/index.php?year=2019&month=10&day=01>
LGEEPA, Ley General del Equilibrio Ecológico y la Protección al Ambiente. <http://www.semarnat.gob.mx/gobmx/biblioteca/index.html>
LGCC, Ley General de Cambio Climático. <http://www.semarnat.gob.mx/gobmx/biblioteca/index.html>
RLGCCMRENE, Reglamento de la Ley General de Cambio Climático en Materia del Registro Nacional de Emisiones. <http://www.semarnat.gob.mx/gobmx/biblioteca/index.html>

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Registro Nacional de Emisiones (RENE). <https://www.gob.mx/semarnat/acciones-yprogramas/registro-nacional-de-emisiones-rene>
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