From the Ground Up
A Decade of Lessons on Carbon Pricing
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The Partnership for Market Readiness (PMR), the World Bank’s flagship technical assistance program to promote carbon pricing and markets, came to an end in June 2021, after 10 years of rich and varied experience in helping countries identify, prepare for, and implement carbon pricing instruments (CPIs) in line with their climate change mitigation goals and development objectives. A total of 23 countries have benefitted from these “readiness” packages, which enabled some to pilot and implement their selected carbon pricing instruments and some to build strong domestic capacity for greenhouse gas (GHG) accounting through robust monitoring, reporting, and verification (MRV) and registry systems, while others managed to assess and develop roadmaps for the CPIs they identified. Overall, the PMR has been successful in building domestic capacity to understand, analyze, and design CPIs, socializing the concept of carbon pricing beyond the technical community and helping countries integrate it into their respective national climate policy dialogues.

The PMR helped 14 countries consider emissions trading systems, 12 carbon taxes, and 9 domestic crediting mechanisms. Sixteen countries managed to assess, design, or develop robust MRV systems, and 22 assessed the role of CPIs. Through its country work programs, the PMR also contributed to capacity building for over 20,000 professionals on various aspects of carbon pricing. Through its technical and policy analysis work programs, it developed more than 50 technical guidebooks and analytical reports and conducted more than 70 global and regional technical workshops and 10 e-courses, in addition to assisting 10 countries with their nationally determined contribution (NDC) formulations and modeling to assess the role of carbon pricing.

As the PMR winds down and its successor—the Partnership for Market Implementation (PMI)—becomes operational in 2021, the time is opportune to take stock of and analyze key lessons learned from the decade of PMR experience. Experiences with carbon pricing initiatives to date have shown the consideration, design, and implementation of CPIs is complex and driven by local context, and, through the PMR, many lessons have been captured on improving the effectiveness and efficiency of such mechanisms, whose general complexity is complicated further by specific implementation challenges associated with them. These are mostly related to technical and institutional capacity, but they are sometimes also influenced by the general perception of carbon pricing and the way it is communicated to relevant stakeholders. This report documents these lessons in a structured way and is expected to provide practical insights for other developing countries planning to design and implement carbon pricing initiatives. In addition, the lessons learned on the PMR process, as well as the grant implementation process, are likely to help similar initiatives, including the PMI, to adopt improved program design and governance options that support efficient funds allocation, deployment, and implementation.

We hope this report will become a valuable tool for experts, practitioners, advisers, and policymakers in developing countries who are embarking on the carbon pricing journey as part of their climate ambition.

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Pricing carbon through the use of such instruments as emissions trading systems (ETSs), carbon taxes, carbon crediting mechanisms, and results-based climate finance payments is a cost-effective means of achieving decarbonization objectives. As of December 2020, 42 of the 75 parties (56 percent) to the United Nations Framework Convention on Climate Change (UNFCCC) that had submitted their new or updated nationally determined contributions (NDCs) indicated in them carbon pricing as domestic mitigation measures.*

The World Bank’s Partnership for Market Readiness (PMR) was established in 2011 to build countries’ capacity to identify, design, develop, and implement carbon pricing instruments (CPIs), along with relevant policies, laws, and regulations, and to create a global platform for knowledge exchange and learning. Since its inception in 2011, the PMR has, through grant support and technical assistance, supported 23 emerging economies and developing countries in building their institutional and human capacities to design, institute, and implement CPIs, such as ETSs, carbon taxes, and/or carbon crediting mechanisms. In the process, it has produced a vast body of knowledge and provided a global platform for sharing experiences and mutual learning.

This report draws lessons from the PMR’s decade-long country, technical work, and policy analysis work programs and relates the insights captured through its extensive country participant consultation process, its online surveys, and feedback from its contributing country partners and World Bank task teams. The lessons drawn are presented in two parts, with the first covering the country work programs and the second covering the PMR process and governance and the technical and policy analysis work programs.
A strong community of more than 20 PMR observers, including multilateral development banks, UN system agencies, international business organizations, international climate partnerships and NGOs joined forces to support program implementation at global and country levels.

The PMR support could lead to significant mitigation by participating countries “going on to implement their carbon pricing and market instruments. These countries collectively account for about 44% of global GHG emissions.

A DECADE OF SHARING KNOWLEDGE FOR A LOW-CARBON FUTURE
Over the program’s 10 years, the PMR produced a vast body of knowledge, including influential guidebooks on emissions trading, carbon taxes, MRV systems, and communicating carbon prices; analytical reports; and an annual report on the State and Trends of the Carbon Pricing.
PART I:
Readiness Support for Country Work Programs, with Selection, Design, and Implementation of Carbon Pricing Instruments

The PMR experience has shown that the process of selecting, designing, and implementing CPIs is complex and driven by local context. The lessons drawn from the PMR should, therefore, be considered in terms of the existing policies and institutional ecosystem of a given country, its political will, and the technical capacity of relevant stakeholders. The key takeaways, based on the assessments performed, feedback received from the country, and expert views, are grouped in the report under the major building blocks of the PMR’s market readiness proposal (MRP) — an action plan developed by each country for assessing, designing, and piloting market-based instruments for global greenhouse gas (GHG) mitigation. These takeaways are summarized below.

THE OVERARCHING TAKEAWAYS

Country considerations related to the role of any carbon pricing instrument are highly influenced by the local environmental and developmental benefits conferred by reducing greenhouse gas emissions. While decarbonization remains a core objective, several PMR countries that examined the role of carbon pricing responded mainly to the local fiscal challenges they faced in the immediate term, including those associated with air pollution mitigation, job creation, and additional revenue generation. These considerations created an impetus for the countries to advance sustainability agendas in sectors of prominence. In the particular instance of working toward carbon tax readiness, those that based their tax designs, including monitoring, reporting, and verification (MRV) provisions, on CO₂ emissions rather than fossil fuel consumption were better placed to make transitions to CPIs in the future [Chile].

Carbon pricing assessment and decision-making processes must take into consideration alignment and interaction with the broader policy landscape. Coordination with the broader policy landscape maximizes synergies with complementary policies, manages likely tensions with overlapping policies, and mitigates tradeoffs associated with countervailing policies [South Africa, Sri Lanka]. Factoring in political and broader policy considerations is crucial to preparatory work on a CPI, particularly in sensitive areas, such as taxation [Chile].

Legal and regulatory frameworks need to be developed and strengthened to create an enabling environment for a CPI. Such frameworks should enable the clear delineation of roles and responsibilities of government agencies, the definition of liable entities and what they must do to comply, and the identification of enforcement provisions, including sanctions for noncompliance. Such clarity provides market participants with the confidence to adopt carbon pricing mechanisms and contributes toward the further development of carbon markets [Vietnam].

Availability of credible data and other information should be prioritized in carbon pricing endeavors, as this is essential to assessing, determining, and implementing an appropriate CPI. First, the availability of data and other information is important
to assessing the cost effectiveness and impacts of different carbon pricing options. Second, after selecting a CPI, reliable data are required for determining the different parameters of that instrument, such as scope, cap, and allowance allocation. Third, when a CPI is implemented, credible reporting of data is essential for its sound operation and instrumental to assessing its effectiveness. The government should also work on developing databases, models, and other tools that enable data-driven decision making, and its data gathering systems for CPI should make use of any GHG inventory and other GHG data management systems stemming from UNFCCC reporting [Thailand, Tunisia].

Important advantages are conferred by adopting a CPI using a phased approach, starting with a pilot and/or initially limiting the coverage of sectors. Those countries that moved from readiness to the implementation phase either started with piloting and/or by limiting the coverage of sectors. Such pilots reveal readiness gaps of countries, which range from lack of data and knowledge to insufficient institutional and legal frameworks for pricing carbon. They also help provide sufficient time to take stock of the design chosen, promote internal and external consultations, identify data gaps, avoid unnecessary political contention because of limited size and coverage, minimize learning costs, and gradually prepare industry and regulators for a national-level carbon pricing mechanism [China, Colombia, Indonesia, Kazakhstan, Mexico, Thailand, Vietnam].

Countries should strive to communicate clearly the benefits of carbon pricing and how carbon revenues are going to be used. Countries need to communicate to the sectors to be covered by the CPI that the market mechanism will contribute to, for instance, improvements in productivity and technological changes, will be beneficial to economic undertakings, will drive transformational changes in the country’s economy, and will be independent of benefits associated with GHGs. Deciding on the use of revenues can be a big challenge, in particular when the process is subject to political pressures from key stakeholders. On the one hand, tying revenues to a particular use provides greater visibility of the link between carbon pricing and public services and greater certainty about funding. Doing so, however, may not be allowed by local legal provisions in many jurisdictions. On the other hand, directing revenues into the general fiscal pool can be beneficial, as this allows greater flexibility to alter uses of the revenue as circumstances and priorities change. Clear communication of how the carbon revenues are going to be used increases support for pricing emissions and trust in the government.

Countries should carefully assess the implications of various design features of a CPI for competitiveness and jobs. Firms are often concerned that they may lose business, profits, or market share to competitors operating in other jurisdictions that do not have to account for a price on carbon. The risk that jobs will be lost can create significant political challenges, particularly since emissions-intensive industries are often clustered in discrete regions. Due consideration of such concerns is, therefore, important during the design phase of a CPI, but it must be based on data-driven evaluation of competitiveness and commercial impacts [Mexico].
CHOOSING A CARBON PRICING INSTRUMENT

The use of economic models for CPI impact assessment should be carefully considered, along with how the results will be interpreted and communicated. Models are inherently limited by data and assumptions and can only give, at best, an estimation of the direction and magnitude of the impact any CPI options will have. Rather than attempting to find a perfect model, however, it is better to start with models that are already used in the country and adjust them with updated information. Since modeling every possible interaction among sectors and policies is not always feasible, it is important to use a set of complementary models, if available, so their respective outputs can be compared to detect any underlying misassumptions of parameters and obtain a better understanding of CPI impacts. Combining analyses from more than one model can also help with exploring a range of possible scenarios of CPIs and complement the limited scope of any particular model or tool (Brazil, Sri Lanka).

Countries should not be deterred from beginning selection of a CPI despite initial limited capacity to implement policies and require businesses to respond to them. The ability of government and businesses to handle the complexity of different CPIs will influence what policy instrument can be implemented and its design features. Limited existing capacity should not, however, discourage a country from beginning preliminary assessment of various CPI options. Capacity can be built up over time through trainings and investments in infrastructure (such as registries and exchanges for secondary market trading), while some CPI designs require limited new capacity.

Governments should carefully consider design choices for their CPIs because they can influence instrument complexity. Although design choices are often made to align with policy objectives, they also have ramifications for capacity and resources. Covering emissions from transportation upstream at the point of fuel distribution, for example, means reduced MRV needs and even offers the possibility of using an existing conventional tax collection system, which substantially reduces complexity and administrative cost.* The complexity of the CPI will also depend on the sectors covered. Whereas coverage of electricity generation can often enable a CPI to cover a large share of emissions from a small number of entities, sectors with diffuse emissions sources, such as waste and agriculture, are more challenging to cover. It is, therefore, important to factor in the possible implications of design choices and policy objectives.

DEVELOPING TECHNICAL INFRASTRUCTURE (MRV AND REGISTRY SYSTEMS) FOR THE IMPLEMENTATION OF A CARBON PRICING INSTRUMENT

Developers of MRV systems should take into consideration existing databases, as well as requirements for and development of other data information systems. This is mainly to enhance capabilities and complementarities and avoid duplication of efforts. Several PMR countries have built their systems using existing data management and information systems to monitor and verify emissions and emissions reductions and gradually moved to more integrated and national systems (Colombia, Costa Rica, India, Jordan, South Africa, Sri Lanka, Vietnam).

* Regulation can be imposed at three possible points in the electricity supply chain. The first is at the fuel source (upstream), which involves directly covering all fuels used in electricity generation by regulating them at their source (that is, where they are produced, imported, or distributed). The second is at the generators (point source of emissions), which allows for more accurate reporting of emissions. The third is where the electricity is used (downstream), which requires consumers to surrender units associated with their consumption of electricity.
The cost effectiveness of MRV and registry systems should be assessed at the beginning, depending on the policy objective; the options include, but are not limited to, adopting off-the-shelf systems or systems developed for other countries that can be customized. The amount of resources needed to develop systems can be prohibitive, depending on their objectives and scope. The PMR experience suggests that, with all else being equal, the savings on development costs for MRV and registry systems could be considerable if they are built on systems already running in other jurisdictions. Such adaptation also mitigates the technical capacity and time constraint issues associated with building these systems from scratch [Panama, Sri Lanka].

A whole-of-system information technology (IT) approach should be encouraged for better efficiency through seamless integration of various reporting and compliance requirements. Most often, countries first build MRV systems just to collect the data required for establishing certain design parameters of the system, such as deciding on thresholds or allowance volume. As countries start developing these systems further, additional functionalities, like the submission of monitoring plans, emissions reporting on a regular basis, and independent verification, are created without sufficient linkage and integration with the original system. This creates additional administrative and governance complications as different systems work in parallel, often with overlaps that could have been avoided with a whole-of-system approach. Hence, the IT system should evolve toward an integrated system that covers the whole compliance cycle of the underlying CPI, including monitoring plans, emissions reporting, verification, and verification management, as well as multiple stakeholder access. The creation of such a system should strive toward a seamless linkage and integration of both MRV and registry systems [Jordan].

Countries should consider MRV regulation that is legally binding and can sufficiently facilitate enforcement and increase compliance with systems requirements. The implementation of MRV needs a legal basis for enforcement and should be underpinned by the institutions and procedures that must be put into place for required reporting. Countries can approach this in different ways, from developing dedicated legislation to adapting existing regulations and including specific provisions in relevant and existing legislation [Colombia, Jordan, Mexico, Turkey].

**DESIGNING AND IMPLEMENTING AN EMISSIONS TRADING SYSTEM**

Experience with operating market-based instruments—for example, energy efficiency and renewable energy programs—at the domestic level, along with private sector engagement in international market mechanisms and encouragement from international organizations, motivated countries to consider mechanisms like the ETS. While the motivations for developing an ETS varied across the PMR countries that explored implementing them, a hugely positive factor was domestic experience with the implementation of market instruments. Other factors included the size of the economy, directives from the government, concerns from industry about the impact of other alternatives (like a carbon tax) on profits and competitiveness, and the experience (positive and negative) of industry with resource allocation. Though not always the case, identification of the agency responsible for implementing the instrument—for instance, the Ministry of Environment versus
the Ministry of Finance—also played a role in its selection. While several of the PMR countries explored the role of ETSs, and some developed roadmaps and concrete plans for their implementation and launched pilot programs, the administrative complexity of the instrument resulting from the requirement to establish the necessary institutional and technical infrastructure for an emissions trading market first was evident.

**An ETS should be able to balance policy flexibility and predictability over time.** The long-term nature of the climate challenge and the various economic and scientific uncertainties associated with it present a need for countries to preserve policy flexibility and allow decision makers to adjust the overall targets, the schedules for achieving these targets, and specific design features in response to changing conditions. Often tradeoffs will occur between policy flexibility and ensuring predictability. The more predictable a system is, the smoother will be its operation and the more certainty the market players will have. To that end, a legal framework that ensures successful long-term functioning of the emissions trading market by defining rules of allowances in subsequent phases, enforcement of participant compliance, and arrangements for appeal and independent arbitration in the event of disputes will ensure predictability of the market. A price or supply adjustment mechanism (PSAM) can also be designed to maintain a supply–demand balance, which ensures long-term, cost-effective decarbonization [Mexico].

**DESIGNING AND IMPLEMENTING A CARBON TAX**

**Fiscal and tax reform processes provided the basis for some PMR countries to consider and introduce carbon taxes in their jurisdictions.** In addition to reducing the GHG emissions, the potential to increase their federal governments’ budgets through tax collection was a main motivation for some countries to design a carbon tax. These countries faced several challenges, however, in terms of maintaining the balance between achieving their objectives and addressing stakeholder concerns. The result was some degree of compromise on design features.

**Countries should carefully assess the advantages and disadvantages of different approaches to introducing a carbon tax.** Multiple factors influence the choice of how to introduce a carbon tax, including the policy objectives behind the tax, the emissions profile of the jurisdiction, the broader political climate, the energy and tax policy landscape, and the structure of key sectors and government capacities for tax administration and MRV. While taxation on fuels (applied upstream) is generally simpler to administer and easier to roll out, especially when “piggybacked” on existing fuel taxation systems, the carbon content of the fuels cannot be easily established ex ante because measuring the carbon content of each single consignment of a fuel is unrealistic; assessment of the carbon content relies, rather, on precalculations based on average emissions [Argentina, Colombia, Mexico]. On the other hand, the direct emissions approach (generally applied downstream), though administratively more complex and costly to implement, can ensure broader coverage of activities beyond just fossil fuel combustion and constitutes a more reliable approach for delivering GHG mitigation. Importantly, the direct emissions or downstream approach sets a foundation for sophisticated carbon pricing policies by gradually building appropriate MRV mechanisms [Chile].

Executive Summary

From the Ground Up
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Countries should adopt a tax rate that is aligned with their development and climate policy goals and their economic, technological, social, and political contexts. In some cases, governments determine tax rates to accomplish certain policy objectives, such as reaching a given level of tax revenue or achieving a targeted level of emissions reductions. In others, the local context may be such that the carbon tax rate selected can be based entirely on political considerations or on what may be acceptable to industry. Although carbon taxes have positive impacts from an emissions reduction perspective when set at an optimally high level and sustained over time, jurisdictions may decide to manage the negative effects associated with introducing a price on emissions by starting at a relatively low level and gradually increasing it to the intended long-term level [Chile, South Africa, Ukraine].

Countries should understand that the features of a robust MRV system are determined by the point at which the carbon tax is regulated. For upstream taxes, emissions down the process are estimated based on fuel sales, avoiding the need for specific MRV of GHG emissions metrics, while taxes targeting direct emissions will typically need more complex MRV systems established [Chile]. Even a country with an upstream tax, however, may choose to develop a robust MRV system for collecting and verifying data, as the system could be applied to implementing other market-based instruments in the future [South Africa].

DESIGNING AND IMPLEMENTING A DOMESTIC CREDITING MECHANISM

Countries should be clear upfront about the motivation for creating a domestic crediting mechanism. Such a mechanism could be designed to enhance the climate ambition, open up additional cost-effective potentials, offer more flexibility to entities covered by the CPIs, and create co-benefits [Chile, Colombia, Mexico, South Africa]. Alternatively, the motivation could be to learn how carbon pricing works—that is, to gain an understanding of the infrastructure, institutional structure, and regulatory environment necessary to implement a CPI effectively—or, in some cases, to trade domestic offset credits internationally toward meeting the country’s NDC targets. Providing clarity on the purpose of a crediting mechanism would facilitate designing the necessary underlying infrastructure accordingly.

The scope of a domestic crediting mechanism should be set so as to avoid an overlap with other domestic carbon pricing instruments. The scope of a domestic crediting mechanism depends on the policy objectives, priorities, and constraints of the implementing jurisdiction. This allows for the consideration of different approaches to determining the eligibility of mitigation activities, such as developing a positive/negative list, imposing threshold limits (for example, allowing the use only of small electricity generators or limiting the use of technologies with higher production costs), or simply excluding activities that are already covered or set to be covered by other CPIs in the near future [South Africa]. Jurisdictions should also consider core elements, such as ensuring environmental integrity, avoiding double counting, and safeguarding environmental and social aspects of climate mitigation activities.

Institutional governance and regulatory mechanisms for crediting systems should be shaped by a jurisdiction’s specific circumstances. A jurisdiction’s circumstances will influence what institutional arrangements look like in practice. Constitutional or other
legal arrangements, for instance, may already delineate areas of responsibility or assign tasks to specific bodies. If a crediting mechanism is put into place to offer flexibility for a carbon tax or ETS, policymakers may want to consider whether the same authorities could run the crediting mechanism and the carbon tax or ETS. The extent to which policymakers rely on, or outsource to, other crediting mechanisms will also affect the governance arrangements [Colombia, South Africa, Sri Lanka].

DEVELOPING STAKEHOLDER ENGAGEMENT, COMMUNICATIONS, AND CAPACITY-BUILDING STRATEGIES

Countries should ensure early and broad stakeholder engagement to build political and industry support, as well as ensure harmonization of various government policies. Stakeholder engagement is essential for confidence building, data collection, and the design and implementation of CPI policy measures. To minimize pushback, it is important to develop a strong rapport with key users and potential administrators of the proposed MRV, registry, or other systems associated with an envisioned CPI and to engage them early on and very actively. Ensuring these stakeholders feel empowered and not left behind or threatened is crucial for the success of the systems. In some cases, this requires more formal agreements and approaches. Proactive engagement of key stakeholders in early stages of the process will also be useful in reducing dissonance in policies between ministries and agencies and ensuring their harmonization [Brazil, Chile, China, Indonesia, Mexico].

Countries might wish to provide an operational focal point or steering committee to ensure sustained support from key government agencies. Having an operational focal point within key ministries and government departments is extremely valuable in facilitating coordination and cooperation on various topics at various levels within those agencies. In addition, strong links to technical teams in relevant ministries, through the setup of a steering committee or sectoral and technical working groups, have proved conducive to having detailed technical discussions on the ministries’ priorities and how the objectives of carbon pricing instruments align with them.

A choice of different channels of communication and types of communication material should be made available to provide flexibility in communication, depending on its purpose. The options for channels of communication could range from technical training courses [Colombia] to a project help desk [Ukraine] to simulation exercises [Mexico] or a “datathon”* [Costa Rica], with different options appropriate for different stakeholders. Communication materials could include, for example, a report prepared for the technical department in a ministry that focuses on the technical elements of a CPI, as opposed to one prepared for high-level officials, such as ministers or deputy ministers, that deals with the broader implications of the CPI for a sector, for the economy, or for the country’s sustainable development and climate change priorities.

Capacity building should start early and be subject to continual evaluation and improvement. For stakeholders to engage effectively in the policy design process, conducting a capacity gap analysis and starting capacity building early in the process is important. Continual evaluation and review of capacity-building programs, based on a capacity-building strategy, is also crucial. The steady improvement of

* A datathon is a hackathon—that is, a usually competitive event at which participants work in groups to create a functioning software or hardware product by the end of the event—except that its focus is on data science.
such activities can be facilitated by collecting information from within and outside of
government on the effectiveness of the activities and the materials used, as well as on
any remaining gaps in capacity.

PART II:
PMR Process and Technical
and Policy Analysis Work Program

The PMR process consisted of two distinct phases. In the preparation phase, countries
formulated their market readiness proposals (MRPs). In the implementation phase,
the readiness activities identified and described in the MRPs were implemented by
the countries, supported by technical assistance grants awarded by the PMR. Grant
resources were administered by the country receiving the grant (recipient-executed) or
with the support of the World Bank (bank-executed) or through a hybrid approach (with
some activities recipient-executed and some bank-executed). In a limited number of
cases, the grants were administered by a third-party delivery partner—for example, the
United Nations Development Programme (UNDP).

The PMR’s technical work program (TWP) complemented the carbon pricing readiness
activities of countries by providing technical trainings and best practice guidebooks
and technical analytical reports on carbon pricing design and implementation issues.
Its policy analysis work program (PAWP) gave countries customized analytical policy
support.

The PMR governance model, including its Partnership Assembly (PA), was well received
and applauded by stakeholders. The spirit of the partnership—a platform where ideas
could be expressed, shared with, and learned from others and an opportunity for
networking—was highlighted as a key feature of PMR governance. Stakeholders valued
the partnership approach and, particularly, the opportunity to hear the voices of both
implementing country participants (ICPs) and contributing participants (CPs) and to
include them in decision making. The sharing of lessons and best practices proved
extremely helpful and effective. The key takeaways, based on experiences from the
PMR process and its work programs, are summarized below.

PMR PROCESS

The PMR Partnership Assembly’s consultative decision-making process,
nonpolitical environment, and neutral platform ensured transparency and
openness. The PMR Partnership Assembly (PA) adopted a unique decision-making
model, in which CPs and ICPs had equal roles to play. The model provided a safe
and practical platform for discussing any technical aspects without constraint and
brought together countries that might take different positions and perspectives on
various aspects of carbon pricing and carbon markets under UNFCCC negotiation. The
unconstrained environment increased transparency and openness in discussions and
helped secure buy-in from all members to the decisions made.

The modality of executing a participating country’s grant-funding activities
(recipient-executed versus bank-executed) should be flexible to accommodate the
country’s circumstances and needs with regard to implementation. Implementation
of program activities by the country itself ensures full accountability and ownership,
while also building the country’s capacity more effectively. To accommodate the varying levels of capacity and preparedness among the different countries, however, several stakeholders from participating and contributing countries suggested that the mode of implementation should be flexible and perhaps take a hybrid approach, in which bank-executed activities are implemented immediately to kickstart the process and build the capacity of the institutions so the country can take over implementation of the remaining activities on its own. This approach could also speed up the implementation process and avoid an unnecessary time gap between the finalization and the signing of the contract between the country and the World Bank. For programs that are recipient-executed (with a national counterpart executing the grant-funded activities), ensuring that the counterpart agency has adequate capacity to implement the program and execute the grant agreement as per the World Bank operational guidance and requirements is of paramount importance.

Regular sharing among the countries of their experiences in program implementation and the progress of their program activities is vital. PMR implementing countries reported their progress at the Partnership Assembly regularly and through an implementation status report (ISR) every year. This practice should be continued, and scope for increasing the transparency of project activity status through an up-to-date dashboard in nontechnical language should be considered. The format of reporting by the countries should be standardized to enable easy comparison of the implementation status of their project activities.

The World Bank’s reporting requirements were crucial to gaining an understanding of the status of the country work programs and challenges associated with implementation. Development of the ISRs and implementation completion reports (ICRs) proved helpful to the countries, the Partnership Assembly, and the World Bank alike by providing regular updates on the status of the projects, capturing lessons learned, and showcasing the impacts the programs made and the challenges they faced.

The PMR’s work programs helped several countries advance the climate change dialogue and supported development policy operations of the World Bank. PMR activities in several countries interacted with, and in some cases influenced, other decarbonization initiatives internal to the World Bank and had a positive impact on the activities conducted by these initiatives. Importantly, readiness program outcomes supported by the PMR in several countries have informed the policy dialogue and become prior actions* in the World Bank’s development policy lending operations. In countries like Jordan, PMR work has led to the identification of follow-up work programs, like the development of roadmaps for long-term strategy development, the “productization” of MRV and registry systems for supporting countries in need of such systems, and the expansion of the World Bank’s climate change agenda beyond the PMR.

* Prior actions are policy and institutional actions deemed essential to achieving the objectives of a program supported by a development policy financing (DPF) operation. They present the legal terms defined in the loan agreement that have to be met for each operation before disbursement.

The PMR’s work program, along with the PMR governance model (including Partnership Assembly meetings and knowledge-sharing events), helped create an international community of carbon pricing professionals. The PMR’s work programs, including at country level, helped build the capacity of more than 20,000 professionals on different aspects of carbon pricing. Not only did the members of this cohort of professionals exchange their own national experiences in advancing carbon pricing in
the many formats for exchange provided by the PMR; many also played a key role in supporting their respective countries in the assessment, design, and implementation of different carbon pricing building blocks. In addition, the cohort helped spread its knowledge and lessons learned to global audiences through various international workshops and conferences. The resulting knowledge exchange was immensely valuable for further advancement of carbon pricing readiness activities.

**TECHNICAL WORK PROGRAM (TWP) AND POLICY ANALYSIS WORK PROGRAM (PAWP)**

Knowledge generated under the technical work program has been considered the best in the industry and has benefited countries beyond the PMR community. The PMR generated significant technical knowledge products on carbon pricing and other market-based instruments and disseminated the knowledge through technical workshops, training programs, and e-courses at both the global and national levels. Regional and country-level approaches that build on this experience should be considered to respond to local needs more effectively and to reach out to more domestic stakeholders.

The policy analysis work program played an important role during the early days of NDC formulation in several PMR countries. The work program supported countries in elaborating and revising NDC plans, including in assessing the role of carbon pricing instruments. The PAWP supported countries’ efforts to determine post-2020 mitigation scenarios and identify packages of effective and cost-efficient policies, including carbon pricing instruments, to achieve climate change mitigation. This approach recognized that countries still needed economic modeling and appraisal of policy options to inform the formulation and assessment of their climate pledges.

Targeted knowledge products should be developed for sectors that are likely to be part of CPIs in many countries. Moving away from global and common topics, the technical work program should look into developing specific guidance on implementing carbon pricing in specific energy- and emissions-intensive sectors, such as cement, steel, and power. The work program should also raise awareness and build knowledge on the crucial role carbon pricing plays in supporting country decarbonization and/or net zero carbon emissions goals. Lessons learned from the PMR implementing countries that have already completed assessment of the CPIs in these sectors or started pilot CPIs could be transferable to many other countries with similar economic and emissions profiles. This transfer could take place, in the future, through other World Bank initiatives, such as the Partnership for Market Implementation (PMI), and/or in cooperation with international development partners.

Knowledge products resulting from such work programs should feed into country work programs. In many cases, country work programs did not take full advantage of several relevant knowledge products generated by the PMR Secretariat. Ensuring the adoption of guidelines, frameworks, and recommendations from these knowledge products could be extremely useful to countries that are assessing the feasibility of CPIs or their piloting and implementation.
# ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>AN-MDP</td>
<td>National Authority of the Mechanism for Clean Development (Côte d’Ivoire)</td>
</tr>
<tr>
<td>CCBA</td>
<td>Climate, Community &amp; Biodiversity Alliance</td>
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<tr>
<td>CDM</td>
<td>Clean Development Mechanism</td>
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<tr>
<td>CED</td>
<td>Central Energy Database (South Africa)</td>
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<tr>
<td>CGE</td>
<td>computable general equilibrium</td>
</tr>
<tr>
<td>COAS</td>
<td>Carbon Offset Administration System (South Africa)</td>
</tr>
<tr>
<td>CORSIA</td>
<td>Carbon Offsetting and Reduction Scheme for International Aviation</td>
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<tr>
<td>CP</td>
<td>contributing participant (donor country)</td>
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<td>CPI</td>
<td>carbon pricing instrument</td>
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<tr>
<td>CPLC</td>
<td>Carbon Pricing Leadership Coalition (Côte d’Ivoire)</td>
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<tr>
<td>DPF</td>
<td>development policy financing</td>
</tr>
<tr>
<td>DF&amp;Bs</td>
<td>Designated Factories and Buildings (Thailand)</td>
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<tr>
<td>EITE</td>
<td>emissions-intensive trade-exposed</td>
</tr>
<tr>
<td>ETS</td>
<td>emissions trading system</td>
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<tr>
<td>EU</td>
<td>European Union</td>
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<td>GHG</td>
<td>greenhouse gas</td>
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<tr>
<td>GS</td>
<td>Gold Standard</td>
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<tr>
<td>ICAP</td>
<td>International Carbon Action Partnership</td>
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<tr>
<td>ICP</td>
<td>implementing country participant (recipient country)</td>
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<tr>
<td>ICR</td>
<td>implementation completion report</td>
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<tr>
<td>(I)NDC</td>
<td>(intended) nationally determined contribution</td>
</tr>
<tr>
<td>IPCC</td>
<td>Intergovernmental Panel on Climate Change</td>
</tr>
<tr>
<td>IPAP</td>
<td>Industrial Policy Action Plan (South Africa)</td>
</tr>
<tr>
<td>ISR</td>
<td>implementation status report</td>
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<tr>
<td>IT</td>
<td>information technology</td>
</tr>
<tr>
<td>LGCC</td>
<td>General Climate Change Law (Mexico)</td>
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<td>MRP</td>
<td>market readiness proposal</td>
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<td>MRV</td>
<td>monitoring, reporting, and verification</td>
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<tr>
<td>NAEIS</td>
<td>National Atmospheric Emission Inventory System (South Africa)</td>
</tr>
<tr>
<td>NAMA</td>
<td>Nationally Appropriate Mitigation Action</td>
</tr>
<tr>
<td>NDC</td>
<td>nationally determined contribution</td>
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<tr>
<td>OBA</td>
<td>output-based allocation</td>
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<tr>
<td>PA</td>
<td>Partnership Assembly</td>
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<tr>
<td>PAT</td>
<td>Perform Achieve and Trade (India)</td>
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<tr>
<td>PAWP</td>
<td>policy analysis work program</td>
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<td>PMI</td>
<td>Partnership for Market Implementation</td>
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From the Ground Up
A Decade of Lessons
on Carbon Pricing

### Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>PMR</td>
<td>Partnership for Market Readiness</td>
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<tr>
<td>PSAM</td>
<td>price or supply adjustment mechanism</td>
</tr>
<tr>
<td>RBCF</td>
<td>results-based climate finance</td>
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<tr>
<td>REC</td>
<td>Renewable Energy Certificate (India)</td>
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<tr>
<td>RENE</td>
<td>National GHG Emissions Registry (Mexico)</td>
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<tr>
<td>RETC</td>
<td>Pollutant Release and Transfers Registry (Chile)</td>
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<tr>
<td>SAGERS</td>
<td>South African Greenhouse Gas Emissions Reporting System (South Africa)</td>
</tr>
<tr>
<td>SINAMECC</td>
<td>National Climate Change Metric System (Costa Rica)</td>
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<tr>
<td>SLCCS</td>
<td>Sri Lanka Carbon Crediting Scheme (Sri Lanka)</td>
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<tr>
<td>TGO</td>
<td>Greenhouse Gas Management Organization (Thailand)</td>
</tr>
<tr>
<td>TP</td>
<td>technical partner</td>
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<tr>
<td>PSAM</td>
<td>price or supply adjustment mechanism</td>
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<tr>
<td>TWP</td>
<td>technical work program</td>
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<tr>
<td>UNDP</td>
<td>United Nations Development Programme</td>
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<tr>
<td>UNFCCC</td>
<td>United Nations Framework Convention on Climate Change</td>
</tr>
<tr>
<td>UNITAR</td>
<td>United Nations Institute for Training and Research</td>
</tr>
<tr>
<td>VCS</td>
<td>Verified Carbon Standard</td>
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</table>
OBJECTIVES of THE REPORT
The Partnership for Market Readiness (PMR) programs have come to an end. Drawing from the PMR’s experiences, this report highlights important achievements in country, technical, and policy work programs, along with capturing challenges the countries faced and lessons they learned in the implementation process.

Experiences with carbon pricing initiatives to date have shown that the consideration, design, and implementation of carbon pricing instruments is complex and driven by local context, and much has been learned with regard to improving the effectiveness and efficiency of such mechanisms. Adding to the general complexity of carbon pricing instruments are specific implementation challenges, which are mostly related to technical and institutional capacity but are sometimes also influenced by general perceptions of carbon pricing and the way its use is communicated to relevant stakeholders. The lessons documented in this report are expected to provide a foundation and practical insights for other developing countries that plan to design and implement carbon pricing initiatives. In addition, the lessons learned on the PMR process, as well as on the grant implementation process, are likely to help similar initiatives, including the Partnership for Market Implementation (PMI), to improve program design and governance options that support efficient funds allocation, deployment, and implementation.

STRUCTURE OF THE REPORT
The report is in two parts. Part I (chapters 1–7) provides key takeaways from implementation of the market readiness proposals (MRPs)* supported by the PMR. Part II (chapters 8–11) covers key takeaways from the process countries followed to get access to and implement PMR grant support, including technical and policy work programs. While part I is based primarily on the experiences of and feedback received from implementing country participants (ICPs), part II includes those from ICPs and contributing participants (CPs), in addition to the World Bank task team members. Part I is preceded by an introduction to the PMR and its evolution.

* The MRP was a tailored proposal developed by an implementing country’s national government, and provided a detailed roadmap of the market readiness components and - as appropriate - market-based mechanisms the country intended to explore as part of its participation in the PMR.
The chapters of part I are based on building blocks of the PMR market readiness proposal template. These chapters summarize the key takeaways from how countries approached implementation of different components of carbon pricing, including the process they followed for their selection, design, and implementation, as follows:

- **Chapter 1**: Takeaways that cut across the implementation of different building blocks of the MRP—namely, the choice of CPI, design and implementation of technical infrastructure for the CPI, and design and implementation of the emissions trading system (ETS), carbon tax, and crediting mechanism
- **Chapter 2**: Key takeaways from the policy analysis work that informed the choice of the carbon pricing instrument
- **Chapter 3**: Key takeaways from the design and implementation of technical infrastructure needed for the implementation of the carbon pricing instrument, including greenhouse gas (GHG) data management and the monitoring, reporting, and verification (MRV) system, along with an emissions trading registry—a database that issues, records, and tracks the carbon units that are exchanged within market mechanisms or financed through a results-based climate finance program
- **Chapter 4**: Key takeaways from all actions related to the design of an emissions trading system (ETS), including deciding on the scope, setting the cap, distribution of allowances, use of offsets, ETS governance and administrative structures, and use of revenue
- **Chapter 5**: Key takeaways from all actions related to the design of the carbon tax, including those pertaining to scope, tax base, tax rate, use of revenue, oversight, and compliance
- **Chapter 6**: Key takeaways from all actions related to the design of the crediting mechanism, including scope setting, determining the policy context and use of credits, project methodology, project registration, and MRV
- **Chapter 7**: Key takeaways from activities corresponding to stakeholder engagement, communication, and capacity building

Part II of the report is structured as follows:

- **Chapter 8**: Introduction to objectives of part II and governance of the PMR
- **Chapter 9**: Description of the PMR process (preparation and implementation phase) and key takeaways from this process
- **Chapter 10**: Description of the process related to technical and policy analysis work programs and key takeaways from this process

At the end of part II, chapter 11 summarizes how experiences gained both from the PMR process and governance, as well as country support activities, have been considered during the design phase of the Partnership for Market Implementation (PMI).
THE PMR AND ITS EVOLUTION

The failure at the 2009 Conference of Parties (COP15) to reach a global agreement on a successor to the Kyoto Protocol was a major setback to climate action, and the consequent lack of a clear policy signal had a deleterious impact on the international carbon markets. The World Bank’s Partnership for Market Readiness (PMR), a global partnership consisting of 42 developed and developing countries and subnational jurisdictions, was originally conceived to address the vacuum created by this adverse development and to create a nonpolitical space in which progress on designing and developing carbon markets could continue. The PMR was established as a platform to explore approaches and modalities for the next generation of carbon markets and to support efforts by emerging economies to consider and implement carbon pricing instruments. With capacity building and technical assistance as its main goal, the PMR was announced at COP16 in Cancun and formally launched at the Carbon Expo, Barcelona, in 2011. Over the course of the PMR program (2011–20), a total of $125 million was mobilized in funding from 13 contributing participants,* and, throughout the past decade, it has helped developing countries in the design and rollout of carbon taxes, ETSs, and crediting mechanisms, as well as their underlying monitoring, reporting, and verification frameworks.

The PMR had the following objectives:

- To build countries’ capacity to develop and implement the carbon pricing instruments needed for GHG mitigation and implementation of (intended) nationally determined contributions, or (I)NDCs, through grant funding
- To create a knowledge base on carbon pricing instruments and facilitate information exchange through technical discussions and dissemination of knowledge products
- To help countries identify and implement best practice approaches and, where relevant, achieve compatibility in design to support the development of carbon markets
- To inform the national and international policy discussions on GHG mitigation by sharing lessons learned and providing a platform for collective innovation on carbon pricing instruments

GOVERNANCE OF THE PMR

The operation of the PMR was guided by its governance framework, policies, and procedures. The World Bank acted as the PMR Secretariat, supporting the program operations; as trustee of the PMR Trust Fund; and as the main delivery partner of PMR grant support. The Partnership Assembly (PA) was the decision-making body of the partnership. The partnership, hosted by the World Bank, consisted of three categories of stakeholders: implementing country participants (ICPs), the primary beneficiaries of PMR support; contributing participants (CPs), which contributed financially and provided technical expertise; and technical partners (TPs), comprising selected countries and subnational jurisdictions that received technical and, in some cases, limited financial support. In addition, several partner organizations, including

* Australia, Denmark, Finland, Germany, Japan, Netherlands, Norway, Spain, Sweden, Switzerland, United Kingdom, United States, and the European Commission.
multilateral development banks (MDBs), were observers to the process. The ICPs and CPs contributed to governance of the PMR by voting in the PA. TPs did not have voting power in the PA (see part II, on page 73, for more on the PMR governance process).

PMR WORK PROGRAMS

The PMR provided a forum for sharing experiences with carbon pricing and helped ICPs plan, design, and improve their carbon pricing policies. Discussion in the forum rested on three pillars: the country work program, the technical work program, and the policy analysis work program. The country work program was country specific, while the technical and policy analysis work programs complemented countries’ readiness activities, targeted activities common across countries, and were useful beyond PMR countries.

The country work program (CWP) was based on a market readiness proposal (MRP)—a tailored proposal developed by an implementing country’s national government. First, the implementing country submitted an expression of interest and an organizational framework. Upon approval of the framework, the country prepared an MRP, supported by a preparation grant from the PMR. Once the proposed MRP was in turn approved by the PMR Partnership Assembly, financial support was provided to implement it, with funding ranging from US$3 million to $10 million per country, depending on the scope of activities and the country’s stage of readiness. In total, the PMR supported 23 client countries (19 implementing country participants and 4 technical partners), accounting for more than two-fifths of global GHG emissions (see figure 1).

**Figure 1** Implementing Countries and Technical Partners: Coverage and Achievement

<table>
<thead>
<tr>
<th>PMR Participants</th>
<th>Implementing countries</th>
<th>Contributing participants</th>
<th>Technical partners</th>
</tr>
</thead>
</table>

Implementing countries account for:
- 44% of greenhouse gas emissions
- 55% of the global population
The scope, size, and coverage of these readiness programs varied across countries (see figure 2); some countries are still in the exploratory phase, while others have committed to developing particular carbon pricing instruments. Others have focused on multiple carbon pricing options.

Progress reports and information-sharing sessions in forums like the Partnership Assembly offered opportunities to delve into practical issues, developments, and questions these countries faced.

The technical work program (TWP) complemented the country readiness activities by providing technical trainings and reports on carbon pricing design and implementation issues. These ranged from workshops to e-learnings, policy guides, and more (see part II, on page 80, for more on the TWP).

The policy analysis work program (PAWP) supported countries with customized analytical support—for example, by modeling the impact of a carbon price or NDC emissions scenarios. This helped countries in their mid- to long-term policy planning and in the drafting of INDC and NDC strategies (see part II, on page 80, for more on the PAWP).
**EVOLUTION of THE PMR**

From the time of its official launch in 2011, the PMR evolved significantly to serve the objectives it set for itself, as well as to meet evolving demands over the ensuing decade, including the emergence of the Paris Agreement. Figure 3 illustrates the evolution of the PMR and showcases some key milestones the program achieved (see annex II for details). The launch of the TWP in 2012 and the PAWP in 2014 were two important milestones predating the Paris Agreement in 2015. Also in 2015, an operations monitoring system was developed to enable the Partnership Assembly (PA) to monitor efficiently the progress of the activities laid out in each implementing country’s MRP.

In 2016, the PMR reached another important milestone by concluding the first round of discussions on the strategic orientation of the PMR and by endorsing the criteria and process for the use of remaining funds until December 2020. In 2017, the original PMR objectives were revised to make them more results-oriented in the post-Paris environment, based on recommendations from the first independent evaluation of the PMR. In 2018, a series of consultations for a PMR successor program led to the announcement in 2019 of the Partnership for Market Implementation (PMI); the PAWP was concluded the same year.

**Figure 3  PMR JOURNEY - ADAPTING to EMERGING NEEDS**
In 2020, the PMR established a targeted support window to deliver just-in-time assistance during its last full year of operations in support of 13 additional technical activities. These activities ranged from exploring design options for GHG crediting instruments to the launch of pilot initiatives for innovative sectoral approaches; the formation of a Regional Working Group of Voluntary GHG Management Programs for Latin America, to increase the private sector’s involvement in national carbon footprint programs; and the development of an additional module under the Mitigation Action Assessment Protocol (MAAP) to support standardized assessment of the readiness and capacity needs of countries to implement and manage domestic carbon pricing instruments.

In 2020, the PMI was officially launched. In 2021, this 10-year program will start helping developing countries put carbon pricing instruments in place to meet their NDC and long-term decarbonization targets.
Part I: Key Takeaways from Implementing Market Readiness Activities
From its inception, the PMR supported countries in developing the readiness components they needed to help them identify, prepare for, and implement suitable carbon pricing instruments (CPIs) to enhance their GHG mitigation efforts, in line with their climate change mitigation goals and development objectives. Such readiness components included capacity building for GHG accounting; monitoring, reporting, and verification; stakeholder engagement; policy analysis; and institutional design and arrangements to support carbon pricing. The PMR also provided support to countries ready to design and implement CPIs. While some, such as Chile, Costa Rica, India, and South Africa, had already made policy decisions or begun work toward making policy decisions to do so, other countries embarked on carbon pricing journeys primarily with PMR support.

 Besides carbon pricing–related readiness components, PMR country work programs supported the implementation of relevant mitigation policy instruments. In addition, in several PMR countries, including Costa Rica, Côte d’Ivoire, Jordan, Mexico, Panama, and Peru, other policy-based lending operations supported by the World Bank Group (such as development policy financing operations) began seamlessly building on PMR project activities and outcomes to support the implementation of climate-related policy reforms and increase their effectiveness.

Figure 4 illustrates key carbon pricing milestones in PMR-supported countries. Not all achievements are fully attributable to the PMR work, as some countries had carbon pricing initiatives already underway, and, in some, other international development partners also provided support.
### Key Takeaways from Implementing Market Readiness Activities

**Implementing countries**
- Argentina
- Brazil
- Chile
- China
- Colombia
- Costa Rica
- Côte d’Ivoire
- India
- Indonesia
- Jordan
- Kazakhstan
- Mexico
- Morocco
- Panama
- Peru
- The Philippines
- South Africa
- Sri Lanka
- Thailand
- Tunisia
- Turkey
- Ukraine
- Vietnam

**Contributing partners**
- Australia
- Belgium
- China
- Colombia
- Costa Rica
- Côte d’Ivoire
- India
- Indonesia
- Jordan
- Kazakhstan
- Mexico
- Morocco
- Panama
- Peru
- The Philippines
- South Africa
- Sri Lanka
- Thailand
- Tunisia
- Turkey
- Ukraine
- Vietnam

**Technical partners**
- Alberta
- British Columbia
- California
- New Zealand
- Quebec
- Singapore
<table>
<thead>
<tr>
<th>Country</th>
<th>Achievements</th>
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<tbody>
<tr>
<td>Argentina</td>
<td>Explored market-based instruments in the energy and transportation sectors and further assessed its carbon tax program.</td>
</tr>
<tr>
<td>Brazil</td>
<td>Carried out comprehensive and extensive modeling and assessment of a carbon pricing policy package.</td>
</tr>
<tr>
<td>Chile</td>
<td>Has an active carbon tax program and is developing a domestic offset program. Chile has also launched a scalable MRV program.</td>
</tr>
<tr>
<td>China</td>
<td>Implemented ETSs in five cities and two provinces, before launching the simulation phase of a national ETS—the world's largest carbon market.</td>
</tr>
<tr>
<td>Colombia</td>
<td>Has an active carbon tax program. It is working on an ETS roadmap, as well.</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>Has developed an MRV and registry system, launched a National Carbon Neutrality program, and assessed the introduction of an emissions levy.</td>
</tr>
<tr>
<td>Côte d’Ivoire</td>
<td>Has analyzed options for a carbon tax in its energy, transportation, and land-use sectors.</td>
</tr>
<tr>
<td>India</td>
<td>Has approved a feasibility study for a market-based instrument in the small and medium enterprises (SME) sector.</td>
</tr>
<tr>
<td>Indonesia</td>
<td>Piloted an MRV system in selected power grid systems and its cement and fertiliser subsectors, identified ETS as the most appropriate CPI for the country, and launched a trial ETS covering the power generation sector.</td>
</tr>
<tr>
<td>Jordan</td>
<td>Developed an MRV and registry system, which has become a template for other countries (e.g., Sri Lanka) to adopt.</td>
</tr>
<tr>
<td>Kazakhstan</td>
<td>Developed a GHG e-reporting platform for its ETS, determined the cap and allocation for its fourth National Allocation Plan (NAP), and conducted a legal, technical, and institutional diagnostic for its carbon registry. In addition, Kazakhstan developed recommendations for its updated NDC, with an implementation roadmap.</td>
</tr>
<tr>
<td>Mexico</td>
<td>Has prepared and launched an ETS pilot program, in addition to its carbon tax.</td>
</tr>
<tr>
<td>Morocco</td>
<td>Developed an MRV framework for market-based instruments.</td>
</tr>
<tr>
<td>Panama</td>
<td>Has assessed CPIs in the energy sector and developed key building blocks of its MRV system.</td>
</tr>
<tr>
<td>Peru</td>
<td>Developed different technical building blocks of its national GHG data management and MRV systems and launched its National Carbon Footprint program.</td>
</tr>
<tr>
<td>The Philippines</td>
<td>Assessed the potential of CPIs to achieve its NDC targets and other long-term decarbonization goals.</td>
</tr>
<tr>
<td>South Africa</td>
<td>Passed the Carbon Tax Act, which introduced a carbon tax and domestic offset program. The country also upgraded its MRV systems to support both.</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>Is piloting a national MRV and registry system.</td>
</tr>
<tr>
<td>Thailand</td>
<td>Analysed the ETS legal framework, developed the Energy Performance Certificate System, and facilitated implementation of the Low Carbon City Program through the Thailand Voluntary Emissions Reduction Program.</td>
</tr>
<tr>
<td>Tunisia</td>
<td>Assessed the impact on the country’s socioeconomic development of removing energy subsidies and introducing a carbon price. Tunisia is also considering a carbon pricing instrument for the cement sector.</td>
</tr>
<tr>
<td>Turkey</td>
<td>Piloted an MRV system in the electricity, cement, and refinery sectors and developed the legal, institutional, and technical framework for piloting an ETS.</td>
</tr>
<tr>
<td>Ukraine</td>
<td>Has had its MRV law passed through the Parliament and is actively exploring an ETS.</td>
</tr>
<tr>
<td>Vietnam</td>
<td>Assessed CPIs feasible for the country, analysed gaps in its national MRV and registry system, and developed the outlines of pilot CPIs in the steel and solid waste sectors.</td>
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</table>
This chapter takes stock of takeaways that cut across the implementation of different building blocks of the MRP—namely, the choice of CPI, design and implementation of technical infrastructure for the CPI, and design and implementation of the emissions trading system (ETS), carbon tax, and crediting mechanism.

Country considerations related to the role of any carbon pricing instrument are highly influenced by local environmental and developmental benefits conferred by reducing greenhouse gas emissions.

While decarbonization remains a core objective, several PMR countries that looked into the role of carbon pricing responded predominantly to the local challenges they faced in the immediate term, including air pollution mitigation, job creation, and the generation of additional revenue to address some fiscal challenges. These considerations created an impetus for the country to advance sustainability agendas in sectors of prominence. In the particular case of carbon tax readiness, countries that based their tax designs, including MRV provisions, on CO₂ emissions rather than on fossil fuel consumption were better placed to make transitions to CPIs in the future. Chile’s carbon tax on emissions, for example, triggered the development of facility-level MRV regulation and infrastructure, capacity development in the private sector, institutional development regarding MRV functions, and enhanced GHG data availability and transparency.

Carbon pricing assessment and decision-making processes must take into consideration alignment and interaction with the broader policy landscape.

PMR implementing countries that assessed the impacts of their CPIs looked specifically into the interaction and alignment of the CPIs with existing and planned policies in identified sectors to maximize synergies with complementary policies, manage likely tensions with overlapping policies, and mitigate tradeoffs associated with countervailing policies. In South Africa, the carbon tax was supportive of the government’s Industrial Policy Action Plan (IPAP), which sought development of low-carbon sectors, but it conflicted with IPAP’s short-term plans for the expansion of energy-intensive industries with limited options for adopting low-carbon technologies.
This conflict was limited, however, by the initial low level of the carbon tax and the revenue recycling options under consideration.

In some cases, the PMR helped assess how carbon pricing could support the objectives of existing and planned policies in identified sectors. In Sri Lanka, for example, the PMR first helped assess the mitigation potential in each sector and whether the current activities were sufficient to achieve NDC goals. Following that, Sri Lanka assessed the impact of the carbon tax and ETS on the power and transport sectors while simultaneously examining existing policies, such as feed-in tariffs and fuel taxes, to assess their impact on and alignment with CPIs. Based on the assessment, the country decided to perform a detailed impact assessment of regulatory policies and the role they play in the absence of carbon pricing instruments to explore if the regulation of CPIs would have greater impact. This process revealed the challenge of anticipating changes in different policy areas and suggested that policymakers should regularly assess the alignment of planned or proposed CPIs with the broader policy landscape so they can manage these complex interactions in a timely way.

Legal and regulatory frameworks need to be developed and strengthened to create an enabling environment for a CPI.

Carbon pricing must be supported by appropriate legal and regulatory frameworks that, among other things, lay out clearly the roles and responsibilities of government agencies, define the liable entities and what they must do to comply, and set forth the enforcement provisions, including sanctions for noncompliance. Such clarity provides market participants the confidence to participate in carbon pricing mechanisms and contributes toward further development of the carbon market. In Vietnam, the PMR project contributed to the development of regulations on carbon pricing under the revised Law on Environmental Protection (LEP), adopted by the National Assembly in 2020. The revised LEP includes articles on the development and deployment of mechanisms and modalities to mitigate Vietnam’s GHG emissions and on the development and application of the carbon market. These articles will be crucial for creating a legal enabling environment to develop Vietnam’s carbon market and for employing other CPIs. Similarly, the PMR generated technical input to support the preparation of an upcoming decree in Vietnam that will specify the responsibilities and roles of all line ministries, sectors, and provinces in GHG emissions reduction. The legislation will allow the government agencies to use CPIs to reduce GHG emissions within their authority.
CASE STUDY

Role of PMR in strengthening legal and regulatory framework in Panama

In Panama, the PMR supported the strengthening of the legal and regulatory framework to create the necessary enabling environment for implementation of a domestic voluntary carbon market and the country’s participation in international carbon trading. The PMR Panama project generated technical input to inform the drafting and conceptualization of Executive Decree 100 (October 20, 2020), which regulates the Mitigation Chapter of the General Environment Law and establishes the National Platform for Climate Transparency, which will serve as the repository of all climate-related data and information, and the Reduce Your Footprint program. The framework of the Reduce Your Footprint program defines the procedures for executing and monitoring all mitigation actions in the country, including the national MRV system—designed with PMR funds—and its components (Sustainable System of National Greenhouse Gas Inventories, Registry of Emissions and Mitigation Actions, System for the Update and Monitoring of Policies, and the Registry for Means of Implementation). Additionally, the PMR advised the government of Panama on Article 50, which relates to the establishment of a national voluntary carbon market, and on the institutional arrangements and procedures required for a corporate-level registry (the Corporate Reduce Your Footprint program) and a municipal-level registry. These efforts were leveraged by the World Bank Group’s Pandemic Response and Growth Recovery Development Policy Operation (P174107), which included policy actions related to GHG inventory and a voluntary domestic carbon market.

Visit PMR Panama for more country-specific details.

Factoring in political and broader policy considerations is crucial for preparatory work on a CPI.

The carbon pricing design has two streams that must be integrated: a technical stream corresponding to exploring and designing solutions and a political stream corresponding to the exploration of what is possible, considering room for acceptance by various stakeholders. As the latter becomes pivotal to decision making in many instances, it is important to attune technical recommendations with political circumstances and broader national policy context, particularly in sensitive areas such as taxation. In Chile, for example, the political decision on implementing carbon tax was taken together with those concerning the implementation of other green taxes. A main objective of these new green taxes was to fund additional social expenditures. The carbon tax was, therefore, part of a broader tax reform, which made it extremely difficult to introduce changes to its design. Hence, the PMR project shifted its focus in Chile from supporting the design of an emissions trading scheme to supporting the implementation of a carbon tax.
Availability of credible data and other information should be prioritized in carbon pricing endeavors, as this is essential to assessing, determining, and implementing an appropriate CPI.

The importance of credible data and other information in carbon pricing endeavors cannot be overstated. First, the availability of such information is important to assess the cost effectiveness and impacts of different carbon pricing options. Without complete data for a breakdown of costs of each policy measure under the country’s NDC roadmap, for example (such as the costs of various technologies for GHG abatement in local context), it is challenging to evaluate the cost effectiveness of the different policy options. Second, data are important in supporting the choice of a CPI. Without information on the total amount and type of GHG emissions at the individual entity or facility level and the aggregated share of GHG emissions, for example, establishing the feasibility of an ETS that works well is difficult. Third, after a CPI has been selected, credible and reliable data are required to determine the different parameters of that instrument, such as scope, cap, and allowance allocation. Credible data also increase the trustworthiness of the system being built. Finally, when a CPI is implemented, credible reporting of data is essential for its sound operation and is instrumental in assessing its effectiveness.

Provision of an enabling regulation to make GHG data collection and reporting mandatory is, therefore, conducive to designing and implementing a CPI. Data gathering systems for a CPI should leverage any GHG inventory and other GHG data management systems stemming from UNFCCC reporting. Voluntary reporting is not sufficient for the specific purposes of a CPI. In Thailand, for example, a limitation of the government law on disclosing or sharing data among relevant agencies resulted in scheme participants having to report data several times. In Tunisia, the lack of a regulation mandating data collection for emissions reporting made it a challenge.

In addition to having a regulation requiring data collection, a government should focus on developing databases, models, and other tools that enable data-driven decision making.

Important advantages are conferred by adopting a CPI in a phased approach, starting with a pilot and/or initially limiting the coverage of sectors.

PMR countries that have moved from readiness to implementation and those that have already identified and decided to implement carbon pricing instruments have begun their implementation with piloting and/or limited coverage of sectors. China, Kazakhstan, and Mexico started with pilot ETSs, and Colombia is planning to launch one; Thailand started with a voluntary ETS that was designed to serve as a pilot; Vietnam is planning to launch a pilot crediting program in the solid waste management sector and, possibly, another energy-consuming sector, as well as a pilot ETS in the steel and cement sectors and then thermal power plants; and Indonesia launched
a trial ETS covering 80 coal-fired power plants. These experiences revealed that countries usually start with sectors in the economy that have a high share of GHG emissions, where sufficient data are available to inform different design features of the CPI and which can be addressed with the least effort in light of domestic capacity, before moving to a broader coverage that calls for larger efforts. Such pilots also revealed readiness gaps of countries, which ranged from limited data and technical capacities to insufficient institutional and legal frameworks for pricing carbon. The pilots also helped provide sufficient time to take stock of the design chosen, promote internal and external consultations, avoid unnecessary political conflicts by limiting the size and coverage of the CPI, minimize the learning cost, and gradually prepare industry and the regulators for a carbon pricing mechanism at the national level.

Countries with prior experience of carbon markets have a strong foundation for new carbon pricing instruments.

A government’s prior participation in international carbon markets, such as the Clean Development Mechanism (CDM), provides a strong foundation in terms of capacity, tools, and data to assess the applicability and feasibility of other carbon pricing instruments, such as an ETS and a carbon tax. Such experience makes it easier for policymakers to understand the concept of accounting and MRV, as well as relevant standards. In countries like Chile, Colombia, Costa Rica, Mexico, and Peru, the agency leading the engagement with domestic carbon pricing and international carbon markets is the one that has been serving for more than a decade as the CDM Designated National Authority. Institutional arrangements, including interagency coordination mechanisms, have been built upon capacities, processes, and modalities originally implemented and managed for the specific purposes of the CDM. Champions and engaged stakeholders from both private and public sectors that have supported and/or advocated for the next generation of carbon market instruments are largely agents who were involved in the CDM and other project-based mitigation activities.
This section draws on experiences from PMR implementing countries to provide an understanding of how countries chose particular CPIs or combinations of CPIs based on detailed policy analysis, including but not limited to national policy context, policy mapping, policy interaction analysis, emissions scenarios analysis, impact assessment, comparison of carbon pricing options, and analysis of internal government and stakeholder engagement. The modeling and analytical work sought to identify a suitable package of policies and measures—including carbon pricing instruments—understand their impacts and potential barriers to them, and achieve effective policy design. Similarly, analytical work and capacity building sought to advance the understanding of policymakers of how best to integrate carbon pricing in their existing sectoral (energy, transportation, and so on) and national policy landscapes.

**KEY TAKEAWAYS**

After different CPI options are identified, the basis for comparing them should be agreed on with stakeholders before a selection is made.

The basis for comparing different CPI options should be agreed on with stakeholders—relevant government agencies, industries and industry associations, and civil society—before one is selected. The bases for comparison could include sectoral scope, inclusion threshold, underlying policy types, mitigation impact, marginal abatement cost of different technologies, economic impact, impact on low-income and vulnerable groups, and political acceptance, among others. In Sri Lanka, the Climate Change Secretariat of the Ministry of Environment consulted with relevant ministries, including the Ministry of Finance and the Ministry of Energy, along with other public entities and the Central Bank, experts, various business groups, and private sector bodies. They sought to identify relevant CPIs; discuss the sectors to be covered for analysis based on the country’s NDC, mitigation potential, and policies already in place; identify sectors with challenges to the implementation of certain policies; and develop a roadmap for implementation of the carbon pricing instrument selected. Such parameters could also guide impact assessment of individual CPI options.
The use of economic models for CPI impact assessment should be carefully considered, along with how the results will be interpreted and communicated.

One simplifying assumption models usually make is that a policy is “perfectly” implemented, and noncompliance and government failure are minimal. A policy option preferred by a model may not be better in practice because of difficulties in implementation. Many models allow for the inclusion of some shocks, like recessions. By their nature, however, shocks are unexpected in their arrival and unpredictable in their size. Shocks in the future are unlikely to have been perfectly modeled by those in the past, whether they are negative shocks, like the timing and size of recessions, or positive ones, like the introduction of new technologies. A similar argument extends to interactions between sectors. The interrelationships of sectors are often based on empirical data, meaning that future changes in relationships are unknown and cannot be captured with certainty. The CPI itself may change the relationships among sectors in ways not captured by the model. In short, models are inherently limited and can only give, at best, an estimation of the direction and magnitude of impact of any CPI options.

NOTE
In practice, countries chose a combination of several methods to analyze the choice of a CPI:

- Mapping existing policies, laws, and regulations
- Identifying the interactions between existing policies and carbon pricing
- Applying lessons from international experiences
- Performing economic modeling of policy options
- Conducting cost-benefit analysis
- Assessing the political economy
- Conducting multicriteria analysis

In Sri Lanka, preliminary exploration of the role of CPIs in the decarbonizing energy and transportation sectors was heavily based on economic modeling, along with legal, policy, and institutional analysis. The results were corroborated with data and other information gathered through outreach activities, with the aim of exploring political and technical feasibility and building common understandings of issues, challenges, and policy goals. A follow-up exercise, which relied on consultation with selected stakeholders, was completed to develop a roadmap for the identified CPIs.

Visit PMR Sri Lanka for more country-specific details.
Rather than focusing on finding a perfect model, it is better to start with models that are already used in the country and adjust them with updated information. Bottom-up economic models are suited to assessing interactions between different sectors and policies, while top-down models, such as computable general equilibrium (CGE) models, can provide assessments of macroeconomic feedback. As much as possible, it is advisable to conduct modeling exercises at multiple levels, such as economy wide, sector specific, and so on. In Brazil, CGE models were chosen for five sectors—energy, transportation, land use, agriculture, and industry—and a simplified model was chosen for the waste sector.

Since modeling every possible interaction among sectors and policies is not always feasible, it is important to use a set of complementary models whose outputs can be compared to detect any underlying misassumptions of parameters and get a better understanding of the impacts of CPIs. Sensitivity analyses from more than one model can also aid exploration of a range of possible scenarios of CPIs. In Sri Lanka, for example, a CGE model was supplemented with an off-model analysis of the road transportation sector. The off-model analysis provided a disaggregated presentation of the sector that allowed for a more detailed understanding of the impact of carbon pricing scenarios.

While the capacity of government to implement and enforce policies and that of businesses to respond to them is important, lack of it should not discourage CPI implementation.

The ability of government and businesses to handle the complexity of different CPIs will influence what policy instrument can be implemented and its design features. Some elements that could limit the ability of the administration to implement specific CPIs include, among others, limited technical capacity, limited availability of credible data, lack of MRV-related regulations, and lack of a government mandate to regulate emissions, among others. These limitations should not discourage CPI implementation, however. Capacity can be built up over time through trainings and investments in infrastructure (such as registries and exchanges for secondary market trading), while the new capacity required by some CPI designs is itself limited. Simple design does not guarantee easy implementation, though, especially if key actors have little experience with carbon pricing.

Most PMR countries highlighted the importance of intensive capacity building within the government to enable in-house analysis and comparison of different policy options; this included training on how to consider and perform the analysis of interaction of different policies and CPIs. Some countries identified a need to expand capacity-building support to contextualize, in nontechnical language, what selected CPI options would mean for the country economically, environmentally, and socially. Some also underscored the benefits of peer-to-peer knowledge exchange with countries that had already designed and implemented CPIs or were in the process of doing so.
Design choices that reflect policy objectives could also influence instrument complexity.

Design choices, although in many cases aligned with policy objectives, have ramifications for capacity and resources and, hence, need to be considered carefully by governments. The choice to cover emissions from transportation upstream at the point of fuel distribution, for example, means MRV needs will be reduced, and it may even be possible to use an existing conventional tax collection system, which will substantially reduce complexity and administrative cost.* Complexity can also be reduced by building on existing policies—for instance, environmental regulations that require air pollution monitoring may already have established many of the reporting requirements needed for MRV systems. Finally, the complexity of the CPI will also depend on the sectors covered. Whereas coverage of electricity generation can often enable a CPI to cover a large share of emissions from a small number of entities, sectors that have diffuse emissions sources, like waste and agriculture, present a far greater challenge. It is, therefore, important to factor in the possible implications of design choices, the relative relevance of the sectors in terms of climate mitigation, and policy objectives.

National objectives and economic priorities inform the choice of a CPI.

Sometimes the national objectives of a jurisdiction and the opportunities they present determine the choice of a CPI. Mexico, for example, was in the midst of a broader fiscal and taxation reform, making a carbon tax the obvious choice for introduction, as it could be implemented within the existing tax infrastructure and fit into the context of the tax reform.

In other cases, countries choose a carbon tax over other instruments because of the make-up of their economies and their economic development needs. The oligopolistic nature of the energy sector in South Africa, for instance, would have made it difficult to ensure enough traders as well as adequate trading volumes to sustain an ETS. In addition, the lack of many industry players with diverse abatement costs and appropriate market structure was likely to limit opportunities for domestic trade, which could generate inappropriate permit prices. For these reasons, carbon pricing through a carbon tax made sense for South Africa.

Some also see the choice of a CPI as an opportunity to generate a reliable source of revenue, which is, arguably, easier done through a carbon tax. Short-term objectives, like the ease of planning and implementing the instrument, also often skew the choice toward a tax rather than another CPI. Some, however, choose an ETS over a carbon tax because of the certainty it provides regarding the quantity of emissions reduced and the flexibility it offers regarding where and when emissions occur.

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* Regulation can be imposed at three possible points in the electricity supply chain. The first is at the fuel source (upstream), which involves directly covering all fuels used in electricity generation by regulating them at their source (that is, where they are produced, imported, or distributed). The second is at the generators (point source of emissions), which allows for more accurate reporting of emissions. The third is where the electricity is used (downstream), which requires consumers to surrender units associated with their consumption of electricity.
CASE STUDY

How Côte d’Ivoire Made a CPI Choice

To aid its transition toward a low-carbon and climate-resilient future, Côte d’Ivoire identified carbon pricing as an effective policy option as part of its NDC. Based on this NDC mandate, the country’s National Authority of the Mechanism for Clean Development (AN-MDP) commissioned a feasibility study to assess initial design options for the carbon pricing policy applicable to its national economy. The assessment criteria AN-MDP used to choose an applicable carbon pricing option for the country included data availability, size of the economy, and complexity of the pricing option, among others. Ultimately, a carbon tax was considered a better option than an ETS for three reasons:

1. Since Côte d’Ivoire has a small economy dominated by activities by the informal sector, a carbon tax is easier to structure than an ETS to cover those activities efficiently by applying taxation at the source of production.

2. An ETS requires better institutional structure, with strong data availability and data infrastructure, which are currently lacking in the country or very weak.

3. Côte d’Ivoire needs a simple system with low transaction costs that can use the existing fiscal system instead of requiring entirely new administrative structures. A carbon tax was appropriate in this regard.

Accordingly, the PMR program supported technical studies to follow up on the recommendations from the assessment and initiate stakeholder consultation in the relevant sectors, as well as in collaboration with the Carbon Pricing Leadership Coalition (CPLC). Given the very large share of informal output and employment in Côte d’Ivoire, the study incorporated the existence of informal sectors in the analysis through the CGE models of carbon pricing. It showed a carbon tax reform could reduce the tax wedge between formal and informal sectors, allowing it to promote net gains in output, employment, and wages while reducing emissions.

Visit PMR Côte d’Ivoire for more country-specific details.
An effective system for monitoring, reporting, and verification (MRV) is the cornerstone for implementing certain CPI choices and designs. MRV systems are key to ensuring the transparency, precision, and comparability of climate change–related information. Depending on the choice of a CPI, the obligated entity is required to monitor its emissions according to a plan, standards associated with participating CPIs, or legal requirements. At the end of the monitoring cycle or period, the monitored emissions must be reported. Verification is the independent review by an accredited entity of the quality of these reported data and of compliance with CPI-specific requirements. Stringent MRV, where needed, contributes to the credibility of CPIs, since MRV requires high accuracy and comparability of approaches.

MRV systems play a crucial role in providing the trust needed for a well-functioning mechanism. All participants in a carbon market value chain—from those paying a carbon price to those buying a carbon credit—want assurance that the reporting of tons of GHGs is credible, transparent, and trustworthy, and a robust MRV system is essential to ensure the accuracy and integrity of these data.

To enhance their ability to implement CPIs and trade in domestic and international markets, the PMR supported most participating countries in designing the building blocks of their MRV systems.

Different countries began considering MRV and registry systems for meeting specific objectives, and many advanced their agendas with the support of the PMR. These countries are at various stages of development of MRV and registry systems, as summarized in Annex III. The MRV system developed in Jordan became a model for other countries, being adopted or considered for further development in, for example, Panama and Sri Lanka. Some countries beyond the PMR also found it useful for building systems to suit their own domestic requirements.
KEY TAKEAWAYS

Developing a concrete regulatory framework and strong institutional arrangement is key to successful MRV implementation.

It is crucial to create regulation that is legally binding, can sufficiently facilitate and provide incentive for enforcement, and will increase levels of compliance with MRV requirements. A legally enforced MRV system is essential for establishing the credibility and integrity of environmental targets, as it increases the system’s transparency while also enhancing the public’s or the market’s confidence in the data it is using and reporting. Policy support provides the legal basis for regulation and enforcement and underpins the institutions and procedures for GHG reporting that need to be put into place. Jordan, for example, through a climate change bylaw, created the legal basis for implementation of its MRV system and for its use by relevant agencies and ministries. Countries have also approached the regulation of MRV in other ways, including developing dedicated legislation, adapting existing regulations, and adding specific provisions to relevant and existing legislation. In Mexico, the National GHG Emissions Registry (RENE) is regulated by Secretarial Agreement. In Colombia, the National Development Plan (Law 1955 of 2019) has provided a legal mandate for the creation and regulation of an MRV system for national-level mitigation actions. Turkey adopted the European Union’s (EU’s) MRV regulation, which presented challenges in terms of its applicability to the country’s specific circumstances, whereas in Ukraine, the preparation of MRV legislation turned out to be a very lengthy process, mainly due to changes in the government and parliament.

Similarly, a strong and clear institutional arrangement, along with technical and administrative expertise, is important for ensuring progress in implementation. In some cases, where an institution suitable to act as the grant recipient could not be identified, the lack of such arrangements stalled the commencement of implementation, and, in others, a lack of expertise slowed progress in implementing components of the MRP once the funds had been dispersed.

Developers of MRV systems should take into consideration existing databases, as well as requirements for and development of other data information systems.

The development of MRV systems should include an assessment of existing systems to enhance capabilities and complementarities and avoid unnecessary duplication of efforts. As part of the development of their MRV systems, Colombia, India, Jordan, South Africa, Sri Lanka, and Vietnam assessed their existing systems and attempted to map different data sources and requirements to them. In India, an assessment explored how a national meta-registry could be connected to a common platform and sought to facilitate the fungibility with the existing systems, such as the country’s Perform Achieve and Trade (PAT) scheme and its Renewable Energy Certificate (REC) mechanism.
Many countries planned to use existing MRV and registry systems, if available, to monitor, verify, and register offset credits and gradually move to more integrated national MRV and registry systems. Costa Rica, for example, took advantage of its existing National Climate Change Metric System (SINAMECC) platform, beginning with the mitigation action registry and offset registry proof of concept that were developed with the first SINAMECC support package. In Sri Lanka, the PMR study recommended using the national MRV framework as a project database and using offline systems for the time being for some functions (such as additionality assessment) that were not directly related to calculating emissions reductions. In South Africa, rather than developing new MRV tools, the Department of Environment, Forestry, and Fisheries modified the existing National Atmospheric Emission Inventory System (NAEIS) to include all relevant GHGs and created the South African Greenhouse Gas Emissions Reporting System (SAGERS).

The cost effectiveness of MRV and registry systems should be assessed at the beginning, depending on the policy objective; the options include, but are not limited to, adopting off-the-shelf systems or systems developed for other countries that can be customized.

A lack of resources needed for sophisticated MRV and registry systems often constrains their development, depending on the objectives and scope of use for which they are needed. To address these concerns, Sri Lanka relied on an MRV system developed for Jordan. Similarly, Panama designed its national MRV and registry systems by customizing features of an existing architecture. To accomplish this, Panama organized two sessions with the Jordan PMR team to gain an understanding of the design options for the MRV system and held various one-on-one sessions with Costa Rica for the conceptualization and design of the Corporate Registry Program (Reduce Tu Huella Corporativo). The PMR experience suggests that the savings in development costs of MRV and registry systems, with all else being equal, could be considerable if they are built on systems already developed in other jurisdictions. This approach also addresses the technical capacity and time constraints issues associated with building the system from scratch.

Finally, assessment of the cost effectiveness of MRV and registry systems calls for early agreement on and finalization of user fees, administrative costs, and other such requirements, to include them in the estimated cost of operation and maintenance of the systems, as well as their long-term financial sustainability.

A whole-of-system information technology (IT) approach should be encouraged for seamless integration of various reporting and compliance requirements.

Most often, countries first build MRV systems just to collect the data required for establishing certain design parameters of the system, such as deciding on thresholds
and allowance volume. As they start developing these systems further, additional functionalities (submission of monitoring plans, emissions reporting on a regular basis, independent verification, and so on) are created without sufficient linkage and integration with the original system. This creates additional administrative and governance complications as different systems are working in parallel, often with overlaps that could have been avoided with a whole-of-system approach. Hence, the IT system should evolve toward an integrated system that covers the whole compliance cycle of the underlying CPI, including monitoring plans, emissions reporting, verification, and verification management, as well as multiple stakeholder access. The goal should be a seamless linkage between and integration of both MRV and registry systems.

**CASE STUDY**

**A First-of-Its-Kind Multi-Level MRV System in Jordan**

Jordan developed a multi-level MRV system and started its pilot deployment in 2019. The system, owned by the Ministry of Environment, facilitates data on emissions, emissions reductions, and financing, supports verification of the data, and delivers multiple standard reports. This system was the first of its kind, and Jordan lacked the experience and capacity to deploy and operate it fully, so it was piloted within the targeted sectors of environment, energy, and water. The piloting was also essential to gaining an understanding of the data collection and management practices, the quality assurance and quality control practices at each ministry and at the agency level, and the resource requirements of the system. The piloting phase also helped Jordan understand the policy requirements, the additional support needed by the agencies and ministries, and, most important, what needed to be put into place to ensure the sustainability of the system’s operation.

In addition to supporting the development of the system, the PMR provided resources at each agency and ministry involved in the pilot phase to assist with data collection and on-the-job training and capacity building. Extensive training programs were conducted at each level of system users, and user manuals and documentation were prepared. Once having gained experience and familiarity with the system, Jordan was able to deploy it in other sectors, as well, as defined by the UNFCCC, including industry, transportation, agriculture, and waste, ensuring that the comprehensive MRV system covered the entire country.
With the continued support of the PMR, the Prime Minister’s office officially approved the establishment of the integrated, multi-level MRV system in the Ministry of Environment and informed all line ministries of their responsibility to submit data, as required. The PMR project also supported the finalization and approval of the climate change bylaw in May 2019 that provided a mandate for the MRV system, as well as for the development of a national registry. An implementation plan to achieve the goals of the climate change bylaw was also prepared.

Jordan’s first-of-its-kind, multi-level MRV system is now fully developed, so IT-related support can be provided as and when needed.

In terms of stakeholder engagement, during the design and implementation phase, the program involved key public stakeholders, in particular the Jordan Renewable Energy & Energy Efficiency Fund, the Jordan Environment Fund, and the Greater Amman Municipality. Moreover, the PMR team engaged with an inter-ministerial technical working group (PMR-TWG), which included representatives from the Ministry of Finance, the Ministry of Planning and International Cooperation, the Ministry of Water and Irrigation, the Ministry of Energy and Mineral Resources, the Ministry of Local Administration, the Department of Statistics, and the Greater Amman Municipality. In addition, the PMR-TWG was complemented by an IT technical working group, which brought together the IT staff from each of these line ministries, in close coordination with the Ministry of Digital Economy and Entrepreneurship.

In terms of capacity building, the Ministry of Environment and the accreditation bodies received workshop trainings from verification experts on the World Bank IT team about how to carry out verification services and accreditation rules for verifiers. In addition, an independent auditing company was hired to certify the functionalities of the MRV system, based on the ISO 14064 standard that provides a set of tools to quantify, monitor, report, and verify greenhouse gas emissions.

In sum, its MRV pilots have provided significant benefits to Jordan’s government entities by improving capacity to comply with the MRV regulation and strengthening communication with the Ministry of Environment.

Visit [PMR Jordan](https://pmrjordan.org) for more country-specific details.
Several countries and states and jurisdictions within them have implemented emissions trading systems (ETSs), with varied ideas of the role they will play in reducing emissions. In some cases, trading systems are the principal means of achieving emissions reductions; in others, they serve as a backstop measure to ensure reductions if other policies do not deliver. The experience to date shows that, if well designed, an ETS can be an effective, credible, and transparent tool for helping achieve low-cost emissions reductions in ways that mobilize private sector actors, attract investment, and encourage international cooperation.

The design of an ETS consists of five central elements or characteristics:

1. **Scope.** The scope of an ETS refers to the geographic area, sectors, emissions sources, and greenhouse gases for which allowances will have to be surrendered, as well as which entities will have to surrender them.

2. **Cap.** The ETS cap sets a limit on the total amount of emissions that can be produced by the regulated entities, which is then reflected in the number of allowances issued over a specified time period.

3. **Allowance allocation.** The allowance allocation affects the efficiency of the system by influencing abatement incentives. The government can distribute allowances for free, by auctioning, or through some combination of the two.

4. **Oversight and compliance.** The ETS needs rigorous enforcement of participants’ obligations and effective government oversight of the system. A lack of compliance and oversight can threaten not just emissions outcomes by noncompliant entities but also the basic functionality of the market, with high economic stakes for all participants.

5. **Use of offsets.** An ETS can allow offsets—that is, credits for reductions or removals of emissions from sources and sectors not covered by the system—to be used by regulated entities to meet their compliance obligations. This provides a new pool of low-cost compliance units for regulated entities and can significantly reduce the costs of ETS compliance.
The PMR supported countries such as Chile, China, Colombia, Kazakhstan, Mexico, and Ukraine with different aspects of designing, as well as with piloting, ETSs. In countries like Indonesia and Thailand, the PMR supported assessment of the role of ETSs and further consideration of their design and implementation. Annex IV illustrates characteristics of the ETSs of countries where the PMR lent its technical and institutional support.

CASE STUDY

Mexico’s ETS Pilot Program: The First Cap and Trade System in Latin America

Mexico’s participation in the PMR built firmly upon the provisions of the General Climate Change Law (LGCC) and its 2018 reform, which mandated the country’s Ministry of Environment to design a national ETS within 10 months of the reform’s enactment date, beginning with a 36-month pilot program. The pilot was to evaluate potential impacts on industrial competitiveness and give the covered companies time to learn about ETS operation and identify compliance options before proceeding to the operational phase.

Implemented from January 2018 to February 2021, the PMR Mexico readiness program followed a country-driven approach and provided instrumental support to the ministry in gaining sound new technical knowledge on emissions trading in the country and providing inter-sectoral and inter-institutional engagement. The approval of an ETS Pilot Program regulation, published in October 2019, set the priorities for the last implementation years of the PMR. The program encompassed three main components: (1) ETS Pilot Program design elements; (2) development of the ETS Registry (Pilot Program); and (3) cross-cutting capacity building, stakeholder engagement, and communications. The readiness project contributed to, among other things, development of Mexico’s ETS flexibility mechanisms (including modalities for recognition of early actions, a program proposal for domestic offsets, and offset protocols for prioritized mitigation activities), development of a monitoring and evaluation framework to assess the performance and effectiveness of the pilot program, and technical guidance on market oversight and market stability mechanisms. It also helped assess the interactions and complementarities of emerging subnational policies in relation to the ETS and the carbon tax and explore Mexico’s engagement in cooperative approaches under Article 6 of the Paris Agreement.

Visit PMR Mexico for more country-specific details.
Experience with operating market-based instruments—for example, energy efficiency and renewable energy programs—at the domestic level, along with private sector engagement in international market mechanisms and encouragement from international organizations, motivates countries to consider mechanisms like the ETS.

While the motivations for having an ETS varied across the PMR countries that investigated its implementation, domestic experience with the implementation of market instruments was a huge positive factor, along with the size of the economy, directives from the government, concerns from industry about the effects of other alternatives (like a carbon tax) on profits and competitiveness, and industry’s experience (positive and negative) with resource allocation. While not always the case, the identification of the agency responsible for implementing the instrument (for instance, the Ministry of Environment versus the Ministry of Finance) also played a role in its selection. Although several PMR countries explored the role of an ETS, some developed roadmaps and/or concrete plans for its implementation, and some launched pilot programs, the administrative complexity of the instrument stemming from the requirement to establish first the necessary institutional and technical infrastructure for an emissions trading market was evident.

An ETS should be able to balance policy flexibility and predictability over time.

Given the long-term nature of the climate challenge and the various economic and scientific uncertainties associated with it, policy flexibility needs to be preserved and decision makers allowed to adjust the overall target or the schedule for achieving it and specific design features in response to changing conditions. This is important to enable evaluation and review, incorporate new sectors, and respond to external market and non-market shocks. Tradeoffs will often become necessary, however, between policy flexibility and ensuring predictability. The more predictable the system is, the smoother its operation and the more certainty for the market players.

To that end, a legal framework that ensures the long-term functioning of the emissions trading market by defining rules of allowances in subsequent phases, enforcement of participant compliance, and arrangements for appeal and independent arbitration in the event of disputes will ensure its predictability. A price or supply adjustment mechanism (PSAM) can also be designed to maintain a supply–demand balance, which ensures long-term cost-effective decarbonization. In the event of any change, the concerned authorities should clearly and in a timely manner communicate such changes, allowing the participants sufficient time to plan and prepare for them. As part of the Mexican ETS Pilot (2020–22), for example, the government is planning to assess what market stability mechanisms the country should consider to ensure emissions market predictability. The government is also developing a policy monitoring and evaluation framework and related modalities to enable policy flexibility and manage any future risks associated with market-based mechanisms such as an ETS.
Competitiveness and the impact on jobs is often a major concern for countries considering an ETS.

Carbon leakage is one of the most controversial and important aspects to consider when designing an ETS, even if the leakage is often not realized in practice. Carbon leakage occurs when carbon-intensive industrial investments and operations and related GHG emissions are shifted from carbon-limited markets to less stringent ones. Four of the five PMR countries that worked on ETSs reported a concern that firms would lose business, profits, or market share to competitors operating in other jurisdictions that did not have to account for a price on carbon.

The risk of job loss can also create significant political challenges, particularly as emissions-intensive industries are often clustered in discrete regions. In Mexico, the effects of an ETS on competitiveness and on jobs, respectively, have been the topics most discussed with the private sector participants in the market. While no such impacts are foreseen for the pilot phase due to a stipulation in the law to avoid “economic effects,” concerns are being raised about the long-term effects of Mexico’s ETS. Participants have asked the Ministry of Environment to establish provisions to protect industry in the country. In Colombia, the PMR helped develop a competitiveness assessment tool for an initial evaluation of seven carbon-intensive economic activities in the country. The tool was used to assess the effects of an ETS on pulp and paper, mining, steel, chemical, and other metal manufacturing, which are the industries most prone to carbon leakage. The government plans to use this assessment in its sectoral and economy-wide dialogues regarding the drafting and enactment of ETS regulation. 

Deciding on the use of revenues is a big challenge.

Carbon revenues can be crucial in supporting cost-effective climate mitigation, industrial competitiveness, and other economic and development objectives. By selling allowances through auctioning, policymakers can raise significant amounts of public funding. How these revenues are used and how these uses are communicated are critical for public and stakeholder acceptance of carbon pricing. While tying revenues to a particular use provides greater visibility of the link between carbon pricing and public services and greater certainty around funding, directing revenues into the general fiscal pool has benefits, as well, as it allows greater flexibility to alter revenue uses as circumstances and priorities change. Resources in the general pool could also be utilized to address certain equity and distributional concerns that might arise from the country’s just transition efforts—that is, its efforts to ensure that the benefits of the transition to a green economy are shared widely, while those who stand to lose from it—whether countries, regions, industries, communities, workers, or consumers—are supported.

The importance of having a communication strategy that focuses on the issues and concerns raised by stakeholders cannot be overemphasized. In communicating how its carbon revenues were to be used, Brazil focused on how designing a revenue-neutral option could enhance the overall efficiency of the country’s fiscal system. The country highlighted the broader benefits and the positive economic impacts assessed by ex
post analyses of the EU’s and California’s ETSs. Effective stakeholder engagement, as well as monitoring and reporting procedures, can also build public acceptance of an ETS, which is crucial to its longevity.

Most PMR countries that considered ETS found it challenging to set a cap for the system.

The fundamental consideration underlying the ambition of setting a cap is how quickly the jurisdiction wants to reduce emissions within the covered sectors. This consideration, in turn, presents three key issues policymakers should consider:

1. **Aligning cap ambition with jurisdictional targets.** An ETS is typically one of several instruments that may be used in reaching an overarching economy-wide, subnational, or even sectoral emissions reduction target. The ambition of the ETS cap should align with this overarching strategy.

2. **Effort sharing between regulated and uncovered sectors.** The decision on how much mitigation responsibility to assign to sectors under the cap should be based on the capacity of regulated and uncovered sectors to reduce emissions.

3. **Balancing ambition and system costs.** To gain (and maintain) political acceptance, the level of cap ambition will need to be perceived by stakeholders as environmentally credible and fair.

Given the central role of the cap in determining ambition and the level of the price, engaging with stakeholders is vital to the cap-setting process. Stakeholders may include ETS participants, groups that may be adversely affected by or benefit from the carbon price, authorities responsible for policies interacting with the ETS, researchers who can help model the impacts of choices, potential linkage partners, and broader trade partners. These groups are essential for gathering data, building public confidence in modeling results, and gaining support for the ETS at large, as was the case with the pilot of Mexico’s ETS.

Depending on economy-wide ambition and jurisdictional circumstances, countries can consider either a top-down or bottom-up approach to cap setting. In a top-down approach, the government sets the cap based on its overall emissions reduction objectives and a high-level assessment of mitigation potential and costs across sectors regulated by the ETS. This is by far the most common approach. In a bottom-up approach, such as China considered, the government bases the cap on an assessment of emissions, mitigation potential, and costs for each sector, subsector, or participant and determines an appropriate emissions reduction potential for each. The overall cap is then determined by aggregating the emissions and/or emissions reduction potential for those sectors, subsectors, or participants.
An important design consideration when deciding the scope of the ETS in the electricity sector is the point of regulation.

China has imposed emissions regulation both at the point source of emissions and downstream. While the former option may involve less overall regulation and administrative cost than regulating upstream if generators are fewer than fuel sources, the latter provides incentives for energy efficiency and conservation and tends to focus only on large energy users to avoid high administrative costs.

The design of the allocation system should address near-term competitiveness concerns and ensure cost efficiency and distributional equity.

There are four approaches to allowance allocation. One allocates allowances through an auction, and the others (grandparenting, benchmarking, and output-based) allocate them for free. A hybrid approach may also be adopted where some but not all entities in some but not all sectors receive free allowances. Allowance allocation is an important determinant of distributional impacts of an ETS. Because large amounts of resources are at stake, allocation decisions can become highly contentious and a key focus of stakeholder attention and political discussion. The objectives of allocation (for example, managing the transition into the ETS or preserving incentives for cost-effective abatement) should be transparently stated upfront, and subsequent decisions on particular allocation design issues should be explained and justified by reference to these objectives. Grandparenting was allowed in Mexico’s ETS pilot and Kazakhstan’s phase I and II ETS, whereas the PMR study in Ukraine recommended utilizing output-based allocation (OBA) to safeguard emissions-intensive trade-exposed (EITE) competitiveness as ambition is raised.

No PMR country has yet used auctioning at the initial stage of its ETS design; even globally, in fact, auctioning has been introduced on a limited scale initially, but with the intention to let it gradually displace free allocation. Allocation methods can vary across sectors; for example, the power sector is a typical candidate for auctioning, as it is often less prone to carbon leakage than other ETS sectors, while manufacturing sectors have typically received some form of free allocation, at least in initial years. Strategic use of auction revenue can be a powerful selling point for proceeding with an ETS.

Designing and implementing an ETS requires strategic capacity building, particularly in jurisdictions unfamiliar with market mechanisms for climate mitigation.

A program for ETS capacity building can make use of existing materials and tools from other jurisdictions and organizations; governments do not need to start from scratch. In China, the national system is set to be the world’s biggest, initially covering more than 2,225 companies. Initial capacity-building efforts there focused on supporting
ETS pilots and bringing experiences and lessons learned from existing ETSs into specific local and regional contexts and, in turn, applying them to preparations for the national ETS.

A shift in responsibilities for the national ETS from China’s National Development and Reform Commission to the Ministry for Ecology and Environment in 2018 proved a temporary damper on the rollout of capacity building across the country, however, leaving by the wayside many actors who had been trained for roles in ETS management at the national and provincial levels and requiring renewed capacity building. At the end of 2019, a large-scale capacity-building initiative focused on the national ETS allowance allocation plan and other ETS policies and trained nearly 5,000 participants in seven weeks at 17 training sessions across China, enhancing the readiness of public and private sector stakeholders to engage in the construction and, ultimately, the operation of China’s national ETS.

The Chinese experience illustrates the relevance of capacity building well beyond the launch of a system. Investing time and resources in it will generate valuable returns.
A carbon tax can take the form of a direct tax, levy, or excise duty on GHGs or the carbon content of fossil fuels. Governments compare their policy options vis-à-vis various market-based instruments and determine whether to adopt a carbon tax based on the country’s national and economic circumstances, as well as the tax’s alignment with and potential to help achieve the government’s development policy objectives.

The carbon tax design consists of five central elements or characteristics:

1. **The tax base** determines the exact scope of emissions to which the tax is applied.

2. **The tax rate** determines the most appropriate carbon price required to meet the government’s GHG emissions reduction target, which could be anywhere from “introductory levels,” aimed primarily at maximizing acceptance while testing the carbon tax infrastructure, to a rate truly aligned with a climate change scenario of 1.5°C global warming above preindustrial levels.

3. **The assessment of institutional structure** helps establish clear roles, functions, and additional capacities (if needed) of institutions to administer the tax and ensure compliance effectively.

4. **Decisions on use of revenues** determine the use of carbon revenues, in particular whether they will be earmarked for a specific set of projects and activities.

5. **Measures to address unwanted effects** of the tax could include policies and activities to mitigate its negative distributional effects, as well as the offering of tax rebates and the development of criteria to determine eligibility for earmarked carbon revenues.

Socialization of the tax within government and with the public and other nongovernmental stakeholders is also important for its successful adoption and implementation.
The PMR assisted Argentina, Chile, Colombia, Mexico, South Africa, and Ukraine with different design aspects, as well as with piloting and implementation in some cases. In Brazil, Côte d'Ivoire, Turkey, and Sri Lanka, the PMR supported assessment of the feasibility of a carbon tax and its further consideration for design and implementation. Annex V illustrates characteristics of the carbon taxes of countries where the PMR lent its technical and institutional support. The table includes only those countries that have already enacted carbon taxes.

**KEY TAKEAWAYS**

**Fiscal and tax reform processes have provided the basis for some PMR countries to consider and introduce carbon taxes in their jurisdictions.**

In addition to reducing GHG emissions, a main motivation for some countries to design a carbon tax was to increase the federal government’s budget by collecting it. In some cases, challenges countries faced with maintaining a balance between achieving the objectives and addressing stakeholder concerns resulted in some compromises on design features.

**The scope of the tax can be broad or narrow, depending on country considerations.**

Different countries have different considerations for deciding the tax base. These can be related to policy objectives of the instrument, responsiveness to price signals, actors legally responsible for tax payments, thresholds that can be applicable for tax payment, MRV and administration capacity, and, in some jurisdictions, even a legal authority to tax certain sectors or activities. In jurisdictions without a carbon pricing system in place, a broader carbon tax will typically provide greater opportunities for emissions reduction and can offer important economic efficiency gains compared with a narrower carbon tax. Ukraine decided to have a broad tax base to cover a large share of the economy so that externalities could be consistently priced across the economy. The broad base also partly addressed the limitations associated with lower tax revenues because the country started with a relatively low tax rate.

**Countries opt for a fuel approach or direct emissions approach when designing carbon tax.**

PMR countries have adopted both fuel and direct emissions approaches for determining the scope of their carbon taxes.* Multiple factors have influenced this choice, including policy objectives of the tax, the emissions profile of the jurisdiction, the broader political climate, the energy and tax policy landscape, and the structure of key sectors and government capacities for tax administration and MRV. While taxation on fuels (upstream) is generally simplest to administer and easiest to roll out, especially with the preexistence of fuel taxation systems (“piggybacking”), the carbon taxes the production, import, or sale of fossil fuels, whereas a direct emissions approach taxes other emissions, such as those derived from electricity generation, industrial processes, and waste disposal.

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* The first step in defining the base for a carbon tax is to determine which emissions to target. A fuel approach taxes the production, import, or sale of fossil fuels, whereas a direct emissions approach taxes other emissions, such as those derived from electricity generation, industrial processes, and waste disposal.
content of the fuels cannot be established ex ante because measuring the carbon content of each single consignment of a fuel is unrealistic; measurement must rely, rather, on precalculations based on average emissions. In cases where the upstream approach was adopted with the sole objective of raising revenues through taxation, without prior assessment or extensive consultation with relevant stakeholders and with poor communication strategies, its smooth implementation faced obstacles, as costs were mostly passed through to end users.

On the other hand, the direct emissions approach (generally applied downstream), though administratively more complex and costly to implement, can ensure broader coverage of activities beyond just fossil fuel combustion and constitutes a more reliable approach for delivering GHG mitigation. Importantly, the downstream approach sets a foundation for sophisticated carbon pricing policies by gradually building appropriate MRV mechanisms. Certain capacities need to be in place for this approach, however; countries need reliable emissions factors, credible MRV capabilities, and the capacity to monitor emissions at the facility or installation level. Depending on a country’s readiness, developing this capacity could prolong the lead time to the adoption of a carbon tax.

Among the PMR countries, Argentina, Colombia, and Mexico have adopted a fuel approach, Chile relies on a direct emissions approach, and South Africa has adopted a mixture of both. In Argentina and Colombia, the carbon tax was introduced as a part of a tax code reform, and the Ministry of Economy in both cases used the reform to change the structure of fuel levies. In Chile, a direct emissions approach was adopted because it could build on preexisting reporting standards for air pollution at the facility level for energy facilities and also differentiate the carbon tax from existing fuel taxes. This approach was also supposed to prepare the country (through a better MRV) to introduce more sophisticated policies, such as ETS, in the future. South Africa adopted a tax on fuel imports (upstream), in combination with one on process and fugitive emissions at the source (point of emissions) for some of the large industry players. The direct emissions approach was applied only in the case of large industry players to maintain a simple structure with only a few players, thus reducing cost as well as minimizing the opportunity for abuse and risk.

The tax rate reflects a country’s development and climate policy goals, as well as its economic, technological, social, and political context. Governments determine tax rates to achieve certain policy objectives, such as reaching a given level of tax revenue or a target for emissions reductions. In some cases, the local context may be such that the carbon tax rate is selected based entirely on political feasibility.

In Chile, one of the main driving forces behind the carbon tax was the policy commitment to raise funding for education reforms. The setting of the tax rate primarily took into consideration the level that would be “acceptable” for industry.
From the very outset, it was decided to start carbon tax at a relatively low level to leave room for gradual increase over time. No explicit timeline was established, however, for the increment. The stakeholders in Chile have acknowledged the tax of US$5/tCO₂ has had little impact on the relative proportions of fossil fuels versus renewables or clean energy in the country’s energy mixture, in terms of either the energy dispatched or the displacement of GHG-intensive technologies (such as coal or natural gas, versus renewables). In Ukraine, too, a low tax rate of US$0.36/tCO₂ was chosen to reduce resistance from industry to the additional tax burden.

Generally, carbon taxes have impact from an emissions reduction perspective when the tax rate is set at an optimally high level (that is, a level at which it starts getting relatively expensive not to change behavior and begin avoiding or reducing emissions) and sustained over time. An optimally high tax rate is also important to cover the compliance cost associated with running a robust taxation system. Jurisdictions may, however, decide to manage the impacts associated with introducing a price on emissions by starting at a relatively low level and gradually increasing it to the long-term tax level intended. It takes time for liable entities to adjust to the new costs and adopt emissions abatement technologies and practices. To achieve this gradual introduction, jurisdictions may set a trajectory for the carbon tax at the time of implementation. In South Africa, for example, the carbon tax was enacted and became effective in 2019, beginning at 120 rand/t of CO₂e (US$8.50/ton) for that year. For the 2021 calendar year, the rate increased to 134 rand/t of CO₂e.

Earmarking carbon revenues for climate change-related activities is challenging.

For a variety of reasons, there are no examples of PMR countries that have recycled carbon tax revenues for climate or environmental purposes, except for Colombia, where carbon revenues are partially earmarked for social and environmental project activities. Most countries acknowledged that while finding a balance in redistribution of revenues for the funding of specific GHG reduction activities, adaptation to climate change, and support to low-income households is possible, the tax debate usually takes place in an environment where the government already has both existing and planned social and economic activities. This brings the decision down to a political one that reflects the country’s particular priorities and context. In many cases, legal and constitutional barriers to earmarking also exist.

Despite such challenges, countries should strive toward using some exceptional provisions to earmark revenues for climate or environmental purposes, as doing so will gradually build acceptance for the carbon tax by raising trust that it has been implemented for environmental purposes and not as a backdoor way to increase the government’s budget. The earmarking could be limited to the extent that it does not have negative implications for the government’s fiscal management.

While such earmarking of carbon revenues to meet climate or environmental objectives is encouraged, the multiple development challenges and priorities countries face should also be acknowledged. Having additional resources to invest in poverty alleviation or other development priorities can also be considered a net positive.
The features of a robust MRV system for tax reflect the choices countries make. For upstream taxes, emissions down the process are estimated based on fuel sales, avoiding the need for specific monitoring, reporting, and verification of GHG emissions metrics. Taxes targeting direct emissions, on the other hand, will typically call for more complex MRV systems. A carbon tax on fuels can, for example, be added to an existing excise tax, and an MRV system might not be needed. In Chile, the downstream nature of the tax led the Ministry of Environment to develop an MRV system that is consistent with and adaptable to existing institutional and legal frameworks. The reporting component retained coherence with the existing recording and reporting mechanisms applicable to the Pollutant Release and Transfers Registry (RETC in Spanish), while the verification component built on the monitoring system for public policy issues.

Even countries with an upstream tax, however (in addition to a point of source tax on process and fugitive emissions), have robust MRV systems for collecting and verifying data that are then used to determine an entity’s tax liability; one such country is South Africa. With the design and introduction of a carbon tax and offset system, the country modified its existing MRV tools and capacity to meet better the need to measure the emissions of liable entities, collecting these data and converting them to tax liability. As part of its work with the PMR, South Africa modified an existing data system called the National Atmospheric Emission Inventory System (NAEIS) to support the reporting of GHG emissions in line with Intergovernmental Panel on Climate Change (IPCC) guidelines and South African GHG regulations and technical guidelines. The modification included the creation of the South African Greenhouse Gas Emissions Reporting System (SAGERS), an online platform for company- and facility-level reporting with traceability, particularly for those companies that have more than one facility and/or are reporting on more than one GHG emissions category.

Provision of exemptions, lower rebates, flexibility to use carbon offsets, and other supports or compensations can minimize the risk of adverse competitiveness and commercial impacts of a carbon tax, but such provisions should be based on data-driven evaluation of impacts.

Carbon taxation may benefit some sectors and negatively affect others. The government should engage early on in its stakeholder engagement process those sectors that might face adverse competitiveness and consider offering some form of protection. Such protection should, however, be based on data-driven evaluation of competitiveness and commercial impacts and, once implemented, must be periodically reevaluated to assess its effectiveness, usefulness, and need for continuation. In Argentina, the tax rate for mineral coal and fuel oil started at 10 percent of the full tax rate in 2019, with plans to increase it annually by 10 percent to reach 100 percent in 2028. In addition, it exempted the use of fossil fuels in international aviation and shipping from the carbon tax. In South Africa, tax exemptions are provided based on
the level of trade exposure; for example, for entities in trade-exposed sectors, a maximum allowance of 10 percent is applied. Rebates are also offered to sectors with process emissions, and companies have the option to meet up to 10 percent of their liability through the purchase of domestically produced carbon offsets. It is important to note that allowing offsets for reducing the tax liability enables the government to cover sectors that would be difficult to tax and are best mobilized through such incentive-based mechanisms.

**CASE STUDY**

**Use of Offsets as a Flexibility Mechanism for Carbon Tax in South Africa**

With South Africa still undergoing significant economic development, a carbon tax is a way to introduce a carbon price gradually in a way that may avert significant disruptions to competitiveness. Pairing the tax with a complementary offset system helps ensure taxpayers have additional flexibility in how they meet their carbon tax obligation and provides incentive for mitigation and the development of sustainable activities in sectors that are not directly covered by the tax (such as transportation, waste, agriculture, forestry, and other land uses) and/or benefiting from other government incentives.

A key value-add of the PMR support was the creation of the Carbon Offset Administration System (COAS) and the provision of capacity-building support to underpin its implementation. COAS, which launched July 23, 2020, is an online platform that facilitates the listing, transfer, and retirement of carbon credits generated in South Africa and is used to offset carbon tax liabilities. It is administered by Department of Mineral Resources and Energy, and its function is codified in regulation. COAS starts with the approval of a specific project according to a relevant project standard. For the first phase of the tax (through 2023), internationally recognized standards are being used: the Clean Development Mechanism (CDM), the Verified Carbon Standard (VCS), and the Gold Standard (GS); the Climate, Community & Biodiversity Alliance (CCBA) Standard is included under the VCS. For additional phases of the tax, a domestic standard may be developed that better caters to projects above and beyond those covered by the international standards.

All projects undergo the obligatory processes required for project registration and credits issuance according to each specific standard. The oversight and enforcement of the project approval and credit issuance processes are also carried out under the selected standards. Three criteria must be met for an offset to be used to meet South Africa’s carbon tax obligation: project activities
must occur outside the scope of activities subject to the carbon tax; only South African–based credits are eligible; and carbon offset projects registered and/or implemented before the introduction of the carbon tax are accepted, subject to certain conditions.

PMR support for COAS focused on its design and launch, as well as on building the capacity of staff within the Department of Mineral Resources and Energy to manage and troubleshoot the rollout of the system. It is important to note that government coordination was key to the country’s successful implementation of COAS. The National Treasury played a crucial role in leading the formulation of the carbon tax policy and offset regulations, while the Department of Mineral Resources and Energy assumed responsibility for the day-to-day management of the system.

Visit PMR South Africa for more country-specific details.
Carbon crediting is an instrument that can be used with a carbon tax or an ETS within the broad framework of a country’s climate change mitigation strategy. Crediting offers positive incentives for entities to reduce emissions. Under a domestic crediting mechanism, tradeable emissions reduction units called “credits” are issued to actors implementing approved emissions reduction or removal activities. These credits can be issued through domestically established crediting mechanisms; through international mechanisms, like the Clean Development Mechanism (CDM), developed under the Kyoto Protocol; or through independent mechanisms, like the Gold Standard (GS) or Verra’s Verified Carbon Standard (VCS). The PMR targeted its support mainly at jurisdictions considering carbon crediting to achieve domestic climate policy objectives. In some countries, like Sri Lanka, it aimed to extend an existing domestic crediting scheme to activities that rendered those under the domestic scheme fit for participation in international carbon markets.

Crediting can support low-carbon investment, learning, and engagement, while effectively sending a carbon pricing signal. It also offers compliance flexibility to entities covered by a traditional CPI by allowing them to exploit mitigation opportunities in uncovered sectors, which in turn can help policymakers understand the feasibility of eventually bringing uncovered sectors under a carbon tax or an ETS.

The process of designing a carbon crediting mechanism has several steps:

- **Scope setting** involves determining sectors and gases; types of mitigation activities and the GHG sources and sinks from those activities; the scale, or level of aggregation, of eligible mitigation activities crediting; and the locations in which projects may generate eligible credits.

- **Clarifying key elements** relates to five elements that directly affect the environmental integrity of a domestic crediting mechanism: avoidance of double counting; definition of an appropriate crediting period length; approaches to avoiding environmental or social harm resulting from the crediting projects; promotion of the development benefits of the crediting mechanism, if this is an objective of the program; and the potential for temporary emissions reductions and the risk that the emissions removed from a crediting project will be re-released.
Determining project methodologies involves providing the detailed rules, standards, and procedures that proponents must apply to their projects to generate carbon credits. Methodologies can employ either a project-specific approach that relies on analysis of an individual project’s characteristics and circumstances or a standardized approach, in which key components (additionality and the baseline scenario and emissions) are uniformly assessed or determined for specific classes of project activities. Policymakers should establish consistent and transparent rules for how methodologies can be added to the crediting mechanism, including procedures for developing and approving new methodologies. In addition, crediting mechanisms need clear procedures for revising methodologies and updating them.

The PMR offered its support to the implementing countries of Colombia, Costa Rica, Indonesia, Mexico, South Africa, Sri Lanka, Thailand, and Vietnam in assessing, designing, or enhancing carbon crediting mechanisms.

**KEY TAKEAWAYS**

Motivation for a domestic crediting scheme is twofold: to leverage additional cost-effective potentials and to learn foundational elements of a carbon pricing instrument.

Most countries have identified the role of a crediting scheme as positive. Among the PMR countries that have blended their primary carbon pricing instruments with domestic crediting schemes, the major motivation has been to enhance the climate ambition, open up additional cost-effective potentials (for example, by broadening access to emissions reduction options across the economy), offer more flexibility to entities covered by the CPIs, and create co-benefits. Most PMR countries, such as Brazil, Colombia, and Mexico, explicitly mentioned that offset credits could be used within existing compliance systems, with the crediting system primarily designed to reduce the cost of compliance for liable entities. In the case of Mexico, the regulation for the ETS pilot phase sets out core provisions on the use of national offsets for ETS compliance and mandates development of corresponding rules and procedures. Up to 10 percent of the total obligation from each participant will be permitted to be compensated by surrendering offset credits and/or early action offset credits, as long as they originate within Mexican territory and are validated and verified by an appropriate designated entity. In the case of South Africa, entities can meet up to 10 percent of their liability with offsets, but the offsets must come from sectors or activities outside the scope of the carbon tax. In Colombia, 100 percent use of offsets is currently allowed to meet the tax obligations. Chile is also in the process of developing domestic crediting mechanisms that will be linked with its carbon tax. In 2020, Chile’s tax reform set out the use of offsets as a compliance option.
For countries that have only a crediting scheme in place, the motivation has been to learn how carbon pricing works by gaining an understanding of the infrastructure, institutional structure, and regulatory environment necessary to implement a CPI effectively and, in some cases with no domestic CPls in place, to trade eligible domestic offset credits internationally.

The scope of a domestic crediting mechanism should be set so that an overlap with other domestic carbon pricing instruments is avoided.

The PMR countries used different approaches or took into consideration different variables when setting the scope of their crediting mechanisms. In South Africa, only offsets generated from sectors not covered by the country’s carbon tax or on the government’s negative project list (which includes, for example, projects that receive benefits from other government incentives) may be considered. South Africa manages the overlap in renewable power regulations and the inclusion of the power sector under the carbon tax by imposing threshold limits. Only large electricity generators are covered by the carbon tax, for instance, meaning small generators are potentially eligible to generate carbon credits. Overlap with regulations like the country’s Renewable Energy Independent Power Purchase Procurement Program, which provides a feed-in tariff, is also managed through the use of thresholds; only small independent power producers, or technologies facing barriers due to higher production costs, are eligible to generate carbon credits. In addition to minimizing overlap, this ensures that credits can only be generated by small renewable power producers that might need additional support because they are not viable at the available tariffs.16

The use of internationally approved or recognized methodologies reduces fraud, environmental integrity risks, and administrative burden, as well as increasing credibility.

Allowing offsets using well-consolidated and internationally approved methodologies reduces the risk of fraud and strengthens environmental integrity,* increasing the credibility and compatibility of the asset, as well as reducing administrative burdens. For some elements of a crediting program, this could mean relying on elements of existing international crediting programs, such as accredited auditors or approved methodologies. Applying lessons learned from methodologies of international mechanisms such as CDM to the national context, for example, is helpful but still requires ensuring the environmental integrity and transparency of such methodologies. It is also important that such methodologies maintain simplicity and practicality so that all stakeholders—government authorities, project developers, verifiers, and credit buyers—can be more easily involved.

* The environmental integrity is at risk if (i) offsets do not meet the additionality criteria determined by chosen standards, (ii) baseline emissions are overestimated, (iii) offsets are subject to double counting, and (iv) carbon leakage and permanence effects of the offsets are not considered.
Some PMR countries designed and developed specific methodologies and criteria to credit offset activities, while others (such as South Africa) chose standardized methodologies available nationally or internationally. In the case of Colombia, the offset eligibility was limited to CDM methodologies or the methodologies used by other certification programs and carbon standards (for example, issued by the UNFCCC; recognized by Colombia’s National Normalization Body; verified by a third party accredited by specific entities using specified methodologies). In South Africa, projects developed under three different carbon offset standards, including CDM, VCS, and GS, have been permitted during the first phase (2019–22).

Some PMR countries, such as Sri Lanka, benefited from safeguards available in international methodologies that address the issue of environmental integrity. In Sri Lanka, it was concluded that the inclusion of offsets in an ETS or carbon tax could lead to less mitigation overall if the environmental integrity of the offset credits were undermined. The existing crediting system in Sri Lanka, called the Sri Lanka Carbon Crediting Scheme (SLCCS), therefore already has safeguards in place to ensure the environmental integrity of credits in accordance with international standards, since baselines are defined based on CDM methodologies and MRV is implemented according to the CDM rules.

**Carbon credits issued by existing crediting mechanisms can be used in a domestic context to generate a readily available supply of credits and when developing a domestic initiative is constrained by resource availability.**

Domestic policymakers can permit the use of externally issued carbon credits for domestic policy or regulatory requirements. In most cases, domestic policymakers prefer to be selective about which credits are used. To facilitate the selection process, they can adopt “gatekeeping” criteria, which are typically based on project type, vintages, and location (generally domestic). South Africa, for example, allows credits issued under such programs as CDM and voluntary market standards, including VCS, GS, and CDM, to be used to fulfill carbon tax obligations, as long as they are from projects that are located in South Africa, are not covered by the carbon tax, and do not receive certain government subsidies.

Policymakers may want to allow the use of credits issued by existing mechanisms in a domestic context to generate a readily available supply of credits in the near term—for example, to promote early action, increase market liquidity, attract investment, or help reassure participants covered by a newly implemented ETS or carbon tax that the program has flexibility, which can help contain compliance costs. If expedited implementation is a priority, allowing the use of credits issued by existing programs may be advantageous, since establishing a fully independent crediting mechanism often takes years. Another advantage is that it offers a way to source carbon credits without having to establish a domestic initiative, which can be administratively burdensome for a government that is already resource constrained.
Institutional governance and regulatory mechanisms for crediting systems are shaped by a jurisdiction's specific circumstances.

The circumstances of a jurisdiction influence what institutional arrangements will look like in practice. Constitutional or other legal arrangements, for instance, may already delineate areas of responsibility or assign tasks to specific bodies. If a crediting mechanism is put into place to offer flexibility for a carbon tax or ETS, policymakers may want to consider whether the same authorities could run the crediting mechanism and the carbon tax or ETS. While this would be more efficient, those authorities may not have the capacity or technical expertise to manage both policies. In Colombia and South Africa, different ministries run the carbon tax and the crediting mechanism.

In Colombia, the Ministry of Environment manages the crediting mechanism, which requires specialized skills and knowledge in carbon policy and management, while the Ministry of Finance and the National Revenue Services run the carbon tax as an integral part of the national tax system. In South Africa, the South African Revenue Service of the National Treasury administers the carbon tax, while the Department of Mineral Resources and Energy administers the crediting mechanism (COAS). For jurisdictions that have experience with the CDM, the country's designated national authority could be a candidate to take on many of the administrative functions of the domestic crediting mechanism, given the similarities in the skills required. This is the case for South Africa, where the designated national authority in the country's Department of Mineral Resources and Energy administers the crediting mechanism.

The extent to which policymakers rely on, or outsource to, other crediting mechanisms will also affect the governance arrangements. If a domestic crediting mechanism uses methodologies from an existing international crediting mechanism, for instance, policymakers will only need to assess the suitability of the international crediting mechanism at the outset; they do not need the level of technical expertise and input required if they were to draft these methodologies from scratch. Yet even with heavy reliance on existing crediting mechanisms, some domestic institutions will be needed for general policy coordination, oversight, and rulemaking.

In Sri Lanka, the PMR study concluded that the existing crediting scheme could manage to issue credits domestically while relying primarily on international methodologies and international and domestic auditors under an international crediting program. Doing so would ease the burden on domestic institutions, as they would mainly be called upon only to review implementation decisions and guide the overall implementation of the program. On the other hand, the study found, if the current crediting scheme were enhanced so the emissions reduction units would be marketable internationally, as well (under Article 6 of the Paris Agreement, the Carbon Offsetting and Reduction Scheme for International Aviation, or CORSIA, or other mechanisms), the governance framework of the existing scheme would need significant enhancement, with new roles and responsibilities created for several domestic institutions. Such an effort would require strong technical and capacity-building support.
CASE STUDY

Linking with a Domestic Crediting Mechanism in Sri Lanka

In 2016, Sri Lanka launched a national voluntary carbon crediting mechanism called the Sri Lanka Carbon Crediting Scheme (SLCCS). Among its objectives was to introduce an effective and user-friendly program that would bring assurance to authentic GHG reduction and removal project activities, facilitate access for responsible GHG emitters to domestic credits generated by approved projects, and provide innovative carbon crediting approaches to businesses, nonprofit organizations, and government entities engaged in climate action. The PMR project contributed toward strengthening the SLCCS so it could further support the implementation of Sri Lanka’s NDC, as submitted to the United Nations Framework Convention on Climate Change (UNFCCC). The SLCCS would also provide an opportunity to responsible GHG emitters to gain access to international results-based climate finance (RBCF) in the short and medium runs and participate in emerging international market mechanisms under the Paris Agreement in the long run.

As part of its assessment of SLCCS’s existing institutional, legal, and technical frameworks, the PMR reviewed the key requirements for enhancing the scheme to link it with Sri Lanka’s integrated national MRV system and its carbon registry. Specifically, this meant avoiding the double counting and duplication of activities between the SLCCS and the national MRV and registry systems and ensuring the transparency and environmental integrity of the scheme. The study recommended that the registry serve as a carbon unit transaction system for SLCCS to create and issue carbon credits. This would ensure that Sri Lanka would have only one registry into which all domestic carbon units were issued and only one domestic system to undertake transactions of carbon units, which would eventually support the avoidance of double counting. Until the registry were fully operational, however, a separate standalone registry for the SLCCS might be required.

Similarly, the study recommended that projects developed under the SLCCS should use the national MRV framework as a project database and for functions related to MRV, where possible. The national MRV system in Sri Lanka is meant to cover all mitigation activities in the country, including SLCCS projects, Nationally Appropriate Mitigation Action (NAMA) projects and programs, and international crediting projects and programs. It is expected eventually to include a streamlined system for data collection and analysis, with relevant emissions reduction calculation methodologies “embedded” in it.

Since Sri Lanka is customizing the Jordanian MRV system, it will need to integrate additional methodologies to ensure compatibility with the needs of the SLCCS. The national MRV framework will only be able to cover all these needs, however, when the methodologies are updated to include those proposed for the SLCCS.

Visit PMR Sri Lanka for more country-specific details.
The importance of stakeholder engagement, clear and strong communications, and capacity-building support cannot be overstated.

**KEY TAKEAWAYS – STAKEHOLDER ENGAGEMENT**

Early and broad stakeholder engagement is crucial to building political and industry support, as well as to ensuring harmonization of various government policies.

Stakeholder engagement is crucial for confidence building, data collection, and the design and implementation of CPI policy measures. It is important to develop strong rapport with key administrators and users of the proposed MRV, registry, or other systems associated with an envisioned CPI and to engage them early on and very actively to minimize pushback. Ensuring these stakeholders feel empowered and not left behind or threatened is vital. In some cases, this requires more formal agreements and approaches. In Chile, for example, the establishment of an ETS public-private roundtable under the Energy Roadmap allowed for an all-stakeholder ETS discussion, which helped increase the willingness of different stakeholders to collaborate in the drafting of an ETS. In China, the Ministry of Ecology and Environment (formerly the National Development and Reform Commission) regularly invited stakeholders from seven pilot regions to discuss the design of a national ETS so the related lessons could be considered more effectively.

The proactive engagement of key stakeholders at an early stage of the process will also be useful to harmonize policies between ministries and agencies. In Indonesia, technical working groups were established to facilitate open and transparent inter-ministerial dialogues. In Mexico, an ETS simulation exercise and a working group helped in finding common ground with the private sector on usually divergent standpoints and positioned the ETS as a feasible option for GHG mitigation. In Brazil, consultation initiatives helped increase stakeholder engagement in carbon pricing.
Continued engagement of government agencies through the establishment of an operational focal point or a steering committee is essential to ensure sustained support from the government.

The active participation and guidance of government departments that are potentially affected by a CPI are essential to ensure sustained support from them. Having an operational focal point within key ministries and government departments, preferably at a high level, is extremely valuable in facilitating coordination and cooperation on various topics at various levels within those agencies. In addition, strong links to technical teams in relevant ministries through the setup of a steering committee or sectoral and technical working groups proved effective for having detailed technical discussions on the priorities of ministries and how the objectives of the PMR project aligned with them.

High-level visibility and buy-in to the PMR project made stakeholder engagement easier.

High-level visibility and buy-in within the highest level of government ensured that the PMR team had access to and support from key stakeholders in all relevant ministries and was instrumental to achieving high-impact results. The PMR project helped set up meetings and events at the minister or deputy minister level to explain various technical outputs of the readiness project, which helped overcome preconceived negativity about carbon pricing. Communicating the benefits of carbon pricing to the country’s socioeconomic development and NDC implementation was particularly important to changing the mindset of government agencies on carbon pricing.

CASE STUDY

Stakeholder Engagement for Possible ETS Implementation in Thailand

Since 2014, the Thailand Greenhouse Gas Management Organization (TGO) has been organizing a series of meetings and stakeholder consultations to discuss carbon pricing instruments, focusing especially on an ETS, and to brainstorm the possibility of applying a new market-based mechanism to Thailand. The participants comprise representatives from the public and private sectors, including the cement, paper, iron, and petrochemical industries, power plants, and the Federation of Thai Industries, among others.

For the PMR implementation phase in 2016–19, the TGO also collaborated closely with designated factories and buildings (DF&Bs) in 11 sectors: cement, ceramics, iron and steel, petrochemicals, paper, foods and beverages, thermal power plants, department stores, offices, hotels, and hospitals. Upon study of their energy and GHG emissions data and potential for reduction, they were
ready to advance to further actions, among which was the testing by 38 pilot DF&Bs of the MRV system developed under the PMR.

Moreover, a project of the TGO, “Development of Low Carbon Industry for GHG Mitigation in the Eastern Economic Corridor,” recently funded by the national budget in coordination with the Federation of Thai Industries, the Industrial Estate Authority of Thailand, and the 30 designated pilot factories, proposed continued support for enhancing the understanding and knowledge of carbon pricing and the consideration of a new instrument to ensure their sustainable growth. In response to these needs, the PMR provided additional support with which the TGO organized three workshops on the topics of internal carbon pricing and access to green finance, targeting the government agencies and industries in the Eastern Economic Corridor. It also carried out six pilot studies (with GULF Energy Development, Global Power Synergy, PTT Global Chemical, Chemicals Business-SCG, Integrated Refinery & Petrochemical Complex, and Frasers Property Thailand), and it is considering piloting an MRV system for an ETS.

Through these activities, the TGO expects to accumulate best practices and lessons learned for further dissemination to a broader audience. They have also resulted in the companies becoming more familiar with making investment decisions by conducting stress tests with shadow carbon prices and with improving business operations by introducing internal fees and internal trade. The TGO is considering scaling up similar pilot case studies to enhance the industries’ commitment to and support for emissions mitigation through carbon pricing.

Visit PMR Thailand for more country-specific details.

KEY TAKEAWAYS – COMMUNICATIONS

* Availability of different channels of communication provides flexibility to choose one, depending on the purpose of the communication.*

Countries need to agree on different channels of communication—that is, what to use for whom—at the beginning of their CPI development. In Ukraine, a Project Help Desk was highly effective in answering technical questions from a range of stakeholders. Advanced MRV- and ETS-related training courses were also highly appreciated by both the public and private sectors and were a valuable instrument for wider public engagement and involvement. In Colombia and Mexico, ETS course programs were designed for both public and private sectors. In Costa Rica, a “datathon” was organized with the University of Costa Rica to begin developing a community of practice around SINAMECC, the existing National Climate Change

* A datathon is a hackathon—that is, a usually competitive event at which participants work in groups to create a functioning software or hardware product by the end of the event—except that its focus is on data science.
Metric System. In Mexico, a multi-phased ETS simulation exercise was carried out to improve communication between authorities and relevant stakeholders by giving the stakeholders a firm grasp on ETS concepts and design elements. The exercise opened a door for more direct and technically focused exchanges with private sector representatives, an opportunity that led the way to forming a working group, through which both parties—government and private sector—were able to discuss their interests when drafting the ETS regulation. The ETS simulation exercise and working group helped the participants find common ground on usually divergent positions and positioned the ETS as a feasible option for GHG mitigation in Mexico. ETS simulation exercises were replicated in Chile, Colombia, and Turkey.

Communication tailored to a specific audience is more effective than general communication.

The narrative of communication should be tailored to each audience segment rather than using a generic one for everyone. The narrative prepared for the technical department in a ministry, for instance, should focus on technical elements of a CPI, while the one prepared for high-level officials, such as ministers or deputy ministers, should focus on the broader implications of the CPI for a sector, the economy, and the country’s sustainable development and climate change priorities. In Colombia, Mexico, and Peru, the PMR communication strategy clearly defined key messages according to the types of stakeholders to be involved and provided activities to achieve each specific communication objective established according to the project objective.

Communicating benefits of carbon pricing could increase government and industry buy-in.

Communicating less on technicalities but with stronger focus on the benefits of a CPI is more effective in getting buy-in from both government and industry. Such communication should be a two-way process, encouraging regular feedback from the participating stakeholders. The sectors need to be shown that the market mechanism contributes to improvements in productivity and technological changes, is beneficial for economic undertakings, drives transformational changes in the country’s economy, and has benefits independent of those associated with GHG reduction. For the general public, broader development benefits, such as reduced air pollution and the creation of green jobs, also matter more than just the reduction of GHGs, and focusing on them should be a part of an effective communication strategy.
KEY TAKEAWAYS – CAPACITY BUILDING

Capacity building should be started early on and subject to continued evaluation and improvement.

In most PMR implementing countries, stakeholders generally had limited knowledge of different carbon pricing instruments and how they would address climate change or benefit the countries. Conducting a capacity gap analysis and starting capacity building early in the process is, therefore, important if stakeholders are to engage effectively in the policy design process. A continued evaluation and review of capacity-building programs, based on a capacity-building strategy, is also essential. Collecting information from within and outside of government on the effectiveness of capacity-building activities and materials and remaining gaps in capacity can support the process of continuous improvement of such activities. In Indonesia, continued capacity-building activities have improved the quality of GHG emissions data by, among other things, increasing the ability of some companies to calculate the data using the highest standards.

Learning was enhanced by linkage between the local PMR team and international technical experts or PMR project participants in other countries.

Establishing strong links between the local PMR team and international carbon pricing experts, through the Partnership Assembly or international peer-to-peer exchange programs and study tours, resulted in effective informal relationships, producing good insights and support from international experts which would otherwise have been unavailable locally. During project preparation in Thailand, a technical visit to the Sixth Annual India Carbon Market Conclave 2012 in New Delhi helped enhance the TGO’s technical knowledge in identifying a proper mechanism to address the development of energy efficiency in Thailand, was been incorporated as a part of the MRP building block there. In China, the country took this approach a step further by cooperating with the EU on capacity building in ETS with the aim of enhancing the capacity of stakeholders, including the government, companies, and verification companies.
Part II
Delivery of PMR Support:
Project Process and Work Programs
This part of the report focuses on the PMR process, as well as its work programs. It identifies lessons learned from the delivery of the PMR implementation grants that can be incorporated into the design and delivery of grant assistance by the Partnership for Market Implementation (PMI), the successor program to the PMR. These lessons can also help inform the World Bank’s engagement in carbon pricing support to client countries post-2020.

The PMR was supported by an inclusive, open, and transparent governance structure and a well-defined process for countries to follow to obtain the resources they needed. In addition, a highly ambitious technical and policy analysis work program generated a wealth of knowledge and supported capacity building and the training of different stakeholders.

Several stakeholders have spoken of the significant role the PMR played in advancing the use of carbon pricing, not just in PMR countries but globally. The PMR motivated countries beyond those already participating to consider or pursue carbon pricing instruments. The progress in these countries reflects the contribution of the PMR in stimulating the use of CPIs across the globe.
8 Governance of the PMR

The PMR’s governance framework, policies, and procedures are set out in the PMR Governance Framework and PMR Rules of Procedure and illustrated by figure 5. The World Bank, implementing country participants (ICPs), contributing participants (CPs), and technical partners (TPs) who took part in the PMR governance ensured the processes, decision making, and knowledge exchange among them were transparent, collaborative, inclusive, and participatory in nature.

The Partnership Assembly (PA), the decision-making body of the partnership comprising representatives of all the ICPs and CPs, provided strategic guidance for the PMR, monitored its activities and progress, and made final decisions on funding allocations through a consensus and participatory process.
The Partnership Assembly and the PMR governance process were well received and applauded by stakeholders. The CPs, beyond providing grant resources, played a crucial role by sharing their experiences and expertise, which in turn helped ICPs with, among other things, enhancement of their market readiness proposals (MRPs) and the design and implementation of selected technical activities. CPs, ICPs, and TPs also actively participated in several working groups to support deliverables under the technical work program. The spirit of the partnership, which provided a platform where ideas could be expressed, shared with, and learned from others and an opportunity for networking, was highlighted as a key feature of PMR governance. The “sharing” of lessons and best practices proved extremely helpful and effective.

Stakeholders valued the partnership approach to governance, particularly the opportunity it provided to hear the voices of both ICPs and CPs and include them in decision making. The experience they gained through the process also helped them identify opportunities to improve their understanding of the ambitions and objectives of the country proposals vis-à-vis the countries’ capacities and circumstances; streamline the decision-making process to speed up grant approvals while maintaining the partnership spirit that facilitated dialogue and peer exchange among different actors on technical aspects; learn from each other; and identify networking opportunities.
The PMR provided both grant funding and technical assistance to ICPs and eligible TPs. This occurred through two distinct phases, each requiring endorsement by the Partnership Assembly (see figure 6). In the preparation phase, ICPs formulated and presented market readiness proposals (MRPs). Following the endorsement of the MRPs, the allocation of grant funding by the PA, and the negotiation and signing of grant agreements with delivery partners, the implementation phase began, in which the readiness work programs set out in the respective MRPs were implemented.

**Figure 6  PMR Process**

1. Submission of expression of interest to PMR Secretariat
2. Preparation phase funding approved by PA
3. Feedback on MRP (Independent experts + PMR participants + PMR Secretariat)
4. Endorsement of MRP by PA
5. Finalization of implementation arrangements (BETF/RETF/Hybrid)
6. Feedback on MRP
7. Presentation of organizing framework for scoping of PMR activities to PA
8. Preparation of MRP
9. Presentation of revised MRP to PA
10. Allocation of funding
11. Signing of grant agreement
12. Periodic updates to PA and on PMR website (interim reports)
13. Submission of final project report to the Secretariat
14. Capacity building workshops and monitoring/support missions from the Secretariat

**Preparation Phase**

**Implementation Phase**
**PREPARATION PHASE**

During the preparation phase of the PMR process, ICPs formulated MRPs, in which each country detailed the roadmap for its proposed market-based instrument(s) and market readiness components; an estimate of funding required for implementation; and a timetable for completion.

The MRP was based on six building blocks: (1) Country Context; (2) Policy Landscape and Objectives and/or Preparatory Work to Support and Inform Policy Decisions on Carbon Pricing; (3) Core Technical and Institutional/Regulatory Readiness Components for Carbon Pricing; (4) Planning for a Carbon Pricing Instrument; (5) Organization, Communication, Consultation, and Engagement; and (6) Summary of Activities, Timeline, and Budget.

An ICP could receive feedback on its draft MRP through two channels during the preparation phase: from an independent expert group with technical expertise specific to the proposal and from other PMR participants, following a presentation to the PA. Based on this feedback, the ICP revised its draft and presented a final version of the MRP to the PA for funding considerations.

Various factors caused some ICPs to experience delays moving from MRP preparation to implementation; among these were uncertain institutional arrangements for grant implementation, government changes or shifts in political priorities, and comprehensive World Bank due diligence requirements for the grant preparation and negotiation. To avoid such delay, some countries opted for a joint implementation mode in which the World Bank executed certain activities critical to starting the process and informing certain implementation aspects of the CPIs, which helped the countries accelerate the implementation before taking it over on their own. Some countries also identified external delivery partners, such as the United Nations Development Programme (UNDP), to support the implementation of activities. While the PMR aimed for its grants to be fully country-executed (with a national counterpart administering the grant), some ICPs requested that the World Bank administer the grants because of limited capacity for grant administration, time constraints, or lack of working relationships with domestic partner agencies on similar efforts.

All interviewed stakeholders appreciated the clear and transparent process, the detailed guidance documents, the well-structured templates and timely support for their preparation, and the external review process to improve them. They also gave positive feedback on the timely and detailed documentation provided to the CPIs, the partnership model for decision making, learning, and sharing among participants, and the Secretariat’s support throughout the process. A few CPIs felt that more exhaustive assessment of how countries identified the proposed scope of work and their capacity to implement the proposed readiness work program would have helped the PA make decisions to avoid delays.
IMPLEMENTATION PHASE

In the implementation phase, ICPs implemented all CPI components outlined in their market readiness proposals. Some also received additional funding for activities to complement existing ones related to the MRPs and for policy analysis activities at a later stage, depending on the country’s progress toward implementing the activities outlined in the MRP. The PMR used the operations monitoring system to monitor this progress, as well as to highlight lessons learned during implementation.

The PMR Secretariat also developed an annual reporting tool that summarized key information from project implementation status reports (ISRs) by providing a snapshot of the progress of activities within countries and a high-level assessment of the PMR’s progress in achieving its results. These ISRs were the main mechanisms through which progress updates were provided, and their presentation at PA meetings was the means by which CPs and other ICPs received country-specific implementation updates. ICPs completed at least one ISR a year for reporting, filing, and presenting at a PA meeting. Other key inputs to the annual monitoring report were the PMR dashboard, the country metrics, the PMR operational log frame, and an online survey of PMR stakeholders.

While many PMR countries implemented the activities proposed in their initial MRPs, several made changes to the scope of these activities and/or added new ones to meet changing contexts and additional requirements at the domestic level. Depending on the nature of the change, countries sought feedback either from the PA or the Secretariat before proceeding further with it.

The extensive national stakeholder consultation and engagement process of the PMR program in many of the participating countries led to collaboration among various government agencies and played a vital role in inter-ministerial coordination on carbon pricing, which had, traditionally, been difficult. Overall, interviewed ICPs indicated that the program facilitated the national dialogue and relevant information exchange on carbon pricing. The outputs of the country work programs were found to be helpful for engaging policymakers on carbon pricing. Stakeholders highlighted that, in some countries, the PMR contributed to removing institutional barriers between government agencies, which was necessary to building new legislation at the national level in support of CPIs.

KEY TAKEAWAYS

The PMR Partnership Assembly’s consultative decision-making process, nonpolitical environment, and neutral platform ensured transparency and openness.

The PMR Partnership Assembly (PA) adopted a unique decision-making model in which both CPs and ICPs had equal roles to play and provided a safe and practical platform for discussing any technical aspects without constraint and bringing together
countries who might hold differing positions and perspectives on different aspects of
carbon pricing and carbon markets under the UNFCCC negotiation. This enhanced
transparency and openness in discussions, helped secure buy-in from all members
in the decisions made, and provided an opportunity to identify alternative effective
options to the governance model for future programs. In some cases, however, it did
result in delays in decision making.

The modality of executing a participating country’s
grant-funding activities (recipient-executed versus bank-
executed) needed to be flexible to accommodate the
country’s circumstances and needs for implementation.

While a country’s implementation of its own grant-funding activities ensured full
accountability and ownership and built capacity more effectively, interviewed
stakeholders suggested that, to accommodate different capacities and levels of
preparedness, countries could be offered flexibility in the mode of implementing their
programs. One approach to consider is a hybrid one, in which the bank-executed part
of the program is implemented immediately to kickstart the process, and the capacity
of the institutions is built to enable the country to take over implementation of the
remaining activities on its own. This approach could also speed up the implementation
process and avoid an unnecessary time gap between the finalization and signing
of the contract between the country and the World Bank. For programs that are
recipient-executed, however (with a national counterpart executing the grant-funded
activities), ensuring the capacity of the counterpart agency to implement the program
and execute the grant agreement as per the World Bank operational guidance and
requirements is of paramount importance.

Regular sharing among countries of their experiences
in program implementation and the progress of their
program activities is vital.

PMR implementing countries reported their progress at the Partnership Assembly
regularly and through their implementation status reports (ISRs) every year, which
contributed to the sharing of lessons and encouraged mutual emulation. This practice
should be continued in future programs, and scope for increasing the transparency
of project activity status through an up-to-date dashboard in nontechnical
language should be considered. The format of reporting from the countries should
be standardized to enable easy comparison of the implementation status of project
activities across countries.

The PMR’s work program, along with its governance model (including Partnership
Assembly meetings and knowledge-sharing events), helped create an international
community of carbon pricing professionals.
The PMR’s work program, including at country level, helped build the capacity of more than 20,000 professionals on different aspects of carbon pricing. Not only did the members of this cohort of professionals share their own national experiences in advancing carbon pricing in the many formats for exchange provided by the PMR; many also played a key role in supporting their respective countries with the assessment, design, and implementation of different carbon pricing building blocks. In addition, the formation of the cohort helped spread its knowledge and lessons learned to global audiences through various international workshops and conferences. The resulting knowledge exchange was immensely valuable for further advancement of carbon pricing readiness activities.

The World Bank’s reporting requirements were crucial to gaining an understanding of the status of the country work programs and challenges associated with implementation.

Development of the ISRs and implementation completion reports (ICRs) proved helpful to the countries, the Partnership Assembly, and the World Bank alike by providing regular updates on the status of the projects, capturing lessons learned, and showcasing the impacts the programs made and the challenges they faced.

The PMR’s work program helped several countries advance the climate change dialogue and supported development policy operations of the World Bank.

PMR activities in several countries interacted with, and in some cases influenced, other decarbonization initiatives internal to the World Bank and had a positive impact on the activities conducted by these initiatives. Importantly, readiness program outcomes supported by the PMR in several countries (Costa Rica, Jordan, Mexico, Panama, and Peru) have informed the policy dialogue and became prior actions* in the World Bank’s development policy lending operations. In countries like Jordan, PMR work has led to the identification of follow-up work programs, like the development of roadmaps for long-term strategy development, the “productization” of MRV and registry systems for supporting countries in need of such systems, and the expansion of the World Bank’s climate change agenda beyond the PMR. This experience provided an opportunity to build the support needed for future programs, such as the PMI, and for enhancing cooperation with other multilateral organizations to mainstream better the consideration of carbon pricing in fiscal and economic reforms.

* Prior actions are policy and institutional actions deemed essential to achieving the objectives of a program supported by a development policy financing (DPF) operation. They present the legal terms defined in the loan agreement that have to be met for each operation before disbursement.
10 Technical and Policy Analysis Work Program

Beyond the country work program (CWP), the PMR provided support to countries through its technical work program (TWP) and policy analysis work program (PAWP).

The TWP supported, through its knowledge generation and dissemination activities, the design and implementation of carbon pricing systems and their related building blocks and supporting services, such as emissions measurement and reporting, registries, and international climate policies. The main objectives of the TWP were to facilitate experience and knowledge sharing; develop practical guidance on common issues; identify good practice and common standards; and help build necessary capacity. It provided knowledge products, workshops, and training on topics related to the implementation of carbon pricing that are relevant across multiple countries. Building on the PMR expert community and lessons learned from both implementing and emerging carbon pricing jurisdictions, the technical work program offered high-level guidance through documents like Emissions Trading in Practice: A Handbook on Design and Implementation and Carbon Tax Guide: A Handbook for Policy Makers (see figure 7). The work program also expanded to cover new topics, like the political economy and communications challenges of carbon pricing, through publications like the Guide to Communicating Carbon Pricing.

Figure 7 Menu of Key Products Developed under the PMR Technical Work Program - Click on covers to access the publications.
The PAWP supported countries’ efforts to determine post-2020 mitigation scenarios and identified packages of effective and cost-efficient policies, including carbon pricing instruments, to achieve climate change mitigation. The program recognized that countries still needed economic modeling and appraisal of policy options to inform the formulation and assessment of their pledged contributions (INDC and NDC). Through the PAWP, ICPs were able to assess different carbon pricing instruments and their impacts on emissions. Some ICPs indicated that the analytical and modeling work provided helped ensure the carbon pricing instruments they pursued were in line with their NDCs and, in some cases, led to the revision of their NDCs.

CASE STUDY

PMR’s Contribution to Vietnam’s NDC Update
The PMR’s activities and its upstream policy work support for Vietnam’s NDC energy sector mitigation plan also contributed to the country’s updated NDC preparation. The plan indicates explicitly that carbon pricing will be used to enhance the ambition and effectiveness of GHG emissions reduction efforts, especially in energy-consuming subsectors such as steel, cement, building, thermal energy production, and so on. Appropriate carbon pricing instruments will be used in various sectors with a high potential for GHG emissions reduction during the NDC implementation. The plan is also regarded and highly supported by the private sector as an effective means of NDC implementation and for increasing private sector efforts to advance technology along a low-carbon development path.

Visit PMR Vietnam for more country-specific details.

PMR stakeholders, particularly ICPs and donors, held a positive view of the significant role the PMR had played over the years through these two programs in building capacity for carbon pricing at the national, regional, and global levels. The TWP and PAWP were seen to have facilitated effectively the sharing of technical knowledge and experience on the design and implementation of various carbon pricing instruments, including carbon taxes, emissions trading systems, and offset mechanisms. Also mentioned were the best-practice guidebooks developed by these programs for countries implementing carbon pricing.

Process Adopted for the Delivery of the TWP
Through the technical work program (TWP), the PMR played an important role in generating the technical knowledge needed to shape and move discussion on carbon pricing forward in the PMR countries and many others. The TWP explored needs to be addressed through the development of new knowledge products and the delivery of knowledge sharing and learning or training events. It identified these needs through
• a systematic review of MRPs to identify common activities planned (for example, development of MRV systems);

• requests and suggestions from ICPs and CPs; and

• proposals from the Secretariat, based on trends and on needs to respond to developments at the international level.

Each knowledge product included a core element of guidance intended to be applicable and useful to all countries, whether ICPs or not. To address the diversity of local contexts, the products acknowledged the need for guidance to tailor them to country specifics, and they provided suggestions as to how this could be done.

Although the PA allocated a budget to the Secretariat each year for the TWP, the program was delivered under the coordination of the TWP lead, with the support of the PMR Secretariat team, relevant experts within the World Bank, and international experts and firms. In addition, the PMR Secretariat established several thematic technical working groups to guide the Secretariat and review the guidance documents and technical reports it produced. Depending on the topic, the Secretariat also partnered with relevant agencies to develop and deliver certain knowledge products, producing, for example, an ETS guidebook with the International Carbon Action Partnership (ICAP) and e-courses, such as a carbon tax e-course developed with the United Nations Institute for Training and Research (UNITAR). The PMR’s achievements in knowledge production and capacity building are summarized by figure 8.

Figure 8 Knowledge Production and Capacity-Building Achievements of the PMR
In these ways, the PMR created a strong compendium of knowledge that remains available and is used by countries and various partners, such as development agencies and other multilateral institutions, for supporting the consideration and development of domestic carbon pricing.

A unique aspect of the TWP was its support for the development and dissemination of technical knowledge beyond country-specific issues and beyond ICPs, making it readily available for any country to use. The PMR disseminated knowledge through technical notes and guidance documents that were widely accessible on the PMR website and through technical workshops, PA meetings, and other public events. The PA meetings in particular were seen by ICPs and donors as connection points for sharing knowledge on country-level work and an effective avenue for technical dialogue between policymakers from developing and developed countries involved in carbon pricing policies. The PMR events served as a platform to enable policymakers of government agencies, practitioners, and public and private entities to share their own experiences and information regarding elements of market readiness, to learn from one another, to promote South–South cooperation, and to explore and innovate together new instruments and approaches.

Several ICPs responding to surveys cited examples of how they used PMR technical notes and guidance documents as reference in the design of the technical elements needed for their CPIs. Many reported using PMR guidebooks for developing verification and accreditation systems, conducting emissions measurement, developing crediting systems, and using carbon revenues. The Carbon Tax Guide, the Emissions Trading in Practice handbook, and the Guide to Communicating Carbon Pricing were other leading knowledge products reported to be frequently used.

Overall, a wide range of stakeholders considered the knowledge products and the knowledge exchange encouraged and facilitated by the PMR to be of the highest quality and relevance and acknowledged the sharing of experience and information relating to carbon pricing as its most valuable contribution.

**Process Adopted for the Delivery of the PAWP**

The policy analysis work program (PAWP) supported activities at two levels:

1. **Country-specific support** was tailored to a particular country’s needs and carried out after a formal request from the country and subsequent PA approval.

2. **Program-level** activities addressed analytical and modeling topics and issues mainly in the context of the role of carbon pricing in supporting countries’ NDCs.

In the country-specific workstream, a national focal point (usually a government department) developed a work program proposal on mitigation policy modeling and analysis, ensuring that specific activities fed into the overall PMR-supported country readiness program and targeting the production and delivery of different technical
outputs, including models, tools, reports, workshops, and events. Together with the PMR Secretariat, the focal point developed a project concept note for endorsement by the PA and allocation of resources by the Secretariat.

The addition of the PAWP to the overall package of support offered by the PMR was favorably received by stakeholders. It was cited as a key example of the flexibility the PMR offered in its support to ensure its activities remained relevant, connected, and timely to the needs of its participants. The PAWP was seen to have emerged in response to certain needs that had not been identified during the MRP preparation, and it allowed the PMR to adapt to these changing circumstances. ICPs and CPs, as well as the World Bank, all described the PAWP as “very impactful.” CPs, in particular, spoke of the benefits of facilitating further upstream work, showing how carbon pricing instruments could help achieve NDCs with an analysis of costs and benefits.

KEY TAKEAWAYS

The technical work program generated and contributed significantly to the wealth of technical knowledge on carbon pricing and other market instruments for GHG reduction.

The PMR generated significant technical knowledge products on carbon pricing and other market-based instruments at both global and national levels and disseminated the knowledge through technical workshops, training programs, and e-courses at both the global and national levels. In building on the experience, more regional and country-level approaches should be considered to respond to local needs more effectively and to reach out to more domestic stakeholders.

The policy analysis work program played an important role during the early days of NDC formulation in several PMR countries.

The policy analysis work program supported countries in their elaboration of NDCs and their revisions, including assessing the role of carbon pricing instruments in NDC plans. The PAWP supported countries’ efforts to determine post-2020 mitigation scenarios and identified packages of effective and cost-efficient policies, including carbon pricing instruments, to achieve climate change mitigation. This support was provided in recognition that countries still needed economic modeling and appraisal of policy options to inform the formulation and assessment of their climate pledges.
The TWP and PAWP had the flexibility to adapt to country needs in near real time.
Countries could propose topics and—within reason—receive useful output in time to influence their own decision making on carbon pricing on top of that of their own PMR programs. This ability of the PMR to be flexible enough to adapt to the needs of the supported countries in real time was a significant achievement.

Targeted knowledge products for sectors that are likely to be a part of CPIs in many countries should be developed.
Moving away from global and common topics, the technical work program should also look into developing specific guidance on implementing carbon pricing in particular energy- and emissions-intensive sectors, such as cement, steel, and power. The work program should also raise awareness and build knowledge on the crucial role carbon pricing plays in supporting country decarbonization and/or net zero carbon emissions goals. Knowledge gained from the PMR implementing countries that have already completed assessment of the CPIs in these sectors or started pilot CPIs could be transferable to many other countries that have similar economic and emissions profiles. This could be done, in the future, through other World Bank initiatives, such as the PMI, and/or in cooperation with international development partners.

Knowledge products resulting from such work programs should feed into country work programs.
In many cases, country work programs did not fully take advantage of utilizing several relevant knowledge products generated by the PMR Secretariat. Ensuring the adoption of guidelines, frameworks, and recommendations from these knowledge products could be extremely useful to countries that are assessing the feasibility of CPIs or their piloting and implementation.
As carbon pricing as a mitigation tool started gaining prominence in the last decade, the PMR offered technical and capacity-building support to countries that wanted to develop and implement carbon pricing instruments, and it helped with mainstreaming carbon pricing in many policy discussions and decisions at the domestic level. Over that period, despite an initially difficult policy environment marked by negative views on or outward resistance toward carbon pricing, the number of countries interested in considering or implementing it increased substantially—progress which, in large part, could be attributed to the PMR’s efforts. As countries started sharing lessons and best practices from their work on carbon pricing readiness, the PMR evolved as a platform for collective innovation on carbon pricing instruments. Many of these lessons and best practices were regularly featured in and shared through the PMR’s annual reports, knowledge products, workshops, trainings, and other international events.

The potential of these lessons and best practices is twofold: on the one hand, they could become a full recipe for countries to begin exploring the right set of tools and instruments needed to fulfill climate mitigation commitments in their NDCs and their national low carbon development strategies. On the other, the partnership and knowledge-sharing approach of the PMR could become a model for others to adopt in advancing the climate mitigation agenda.

In February 2021, a new facility, the Partnership for Market Implementation (PMI), was launched, building on experience gained from ten years of successful operation of the PMR and an extensive consultation process with relevant stakeholders on how to help countries accelerate climate action through the implementation of carbon pricing instruments and expand readiness support to new countries. The PMI aims to assist countries with the design and deployment of explicit carbon pricing policies appropriate to their domestic contexts and compatible with their sustainable development priorities, as well as with the Paris Agreement’s goals, and to catalyze the development of the next generation of international carbon markets. Through three support windows—an implementation window, a readiness window, and a targeted support window—the PMI has set out to assist at least 10 countries with the implementation of carbon pricing and another 20 with building their readiness. The program targets a capitalization of $250 million over its 10 years’ duration.
Several experiences gained from both the PMR process and governance, as well as country support activities, have been considered during the design phase of the PMI, including the takeaways presented in this report. These are summarized in Table 1. PMR Takeaways Considered in PMI Design.

### Areas of consideration

<table>
<thead>
<tr>
<th>Preparation Phase</th>
<th>How key takeaways are being considered for the PMI process</th>
</tr>
</thead>
</table>

**In response to a request for PMI support for the scope of the work proposed**, the PMI Secretariat will first evaluate the technical and institutional capacity of participating countries, starting with the Expression of Interest (EOI) process. A full endorsement of relevant government agencies and the World Bank country management unit will be requested. New countries that are either in the process of identifying or exploring the role of carbon pricing will be encouraged to consider the readiness window of the PMI.

Requirements such as demonstration of strong political commitment, alignment with the country’s NDC/long-term strategy, and its implementation timelines, along with a clear demonstration of implementation capacity, will be enforced. Accordingly, the scope of the work proposed will be reflected and evaluated.

Based on the experience of countries’ defining their building blocks to fit into fixed funding thresholds under the PMR ($3m, $5m, $8m), these thresholds have been dropped for the PMI. The allocation of the funding will depend on the scope of the work countries propose, in alignment with policy objectives and the timeline for their implementation.

**Reporting requirements for country work programs will be strengthened** and will include preparation of a summary of activities and its updating on a regular basis on the PMI website. Regular and expedited support to countries in need of technical backstopping through, for example, a roster of experts will be considered. The PMI team will enhance efforts to ensure the guidelines provided in relevant technical reports and guidebooks are applied as part of the implementation. More country-specific and regional technical workshops will be conducted to increase countries’ capacities and enhance their implementation capabilities. Like the PMR, the PMI will provide needed flexibility to accommodate evolving/emerging needs of countries.

Based on the knowledge generated, the PMI will support countries in the procurement of consulting firms/experts by sharing standard terms of reference, advising on the qualification of experts and selection criteria, making available a list of qualified experts/firms, and so on.
New knowledge products that look at key sectors and regional aspects for increasing the effectiveness of carbon pricing will be considered. The feedback process and mechanisms to check the follow-up actions will be established. The knowledge management strategy and dissemination channels will be strengthened.

New and innovative approaches for delivery of certain services, such as infrastructure (MRV/registry) support, will be explored. To support countries with optimal resources for their implementation of MRV and registry systems, it is proposed to build on the experience gained from the development and deployment of these systems in the PMR by setting up a Center of Excellence on MRV and Registry and offer the “productized” version of both systems to more countries by making them open source.

While the PMR governance model has been hailed as participatory, inclusive, and ownership driven, it also presented an opportunity to identify effective alternative governance options, mainly to improve the decision-making process, increase transparency, and minimize potential delays in the process. These experiences will be carefully reviewed, assessed, and considered in finalizing the governance of the PMI.
ANNEX I

Methodology of the Study and Limitations

The compilation of this report followed a qualitative methodological approach, consisting of online surveys and interviews, literature review and analysis of internal project monitoring, and evaluation reports. These methods are briefly discussed below, followed by the limitations and challenges to which the report was subject.

METHODS

Online survey
Questionnaires were sent out by the PMR Secretariat to the implementing country participants to capture their experiences with the PMR program. Out of 23 PMR implementing countries, 18 responded in writing, and the rest were consulted through phone interviews. The questionnaires were in two parts. The first comprised general questions intended to provide an understanding of the most important challenges and lessons, while the second posed detailed questions on specific carbon pricing project components.

Interviews
Telephone interviews were conducted, where necessary, with representatives of the implementing and contributing participants.

Country work program deliverables and the World Bank implementation support and completion reports
The report drew on deliverables from country market readiness proposal activities, annual implementation support reports (ISRs), and implementation completion reports (ICRs). Two independent evaluation reports and the PMR annual reports were also considered.

PMR technical notes and guidebooks
PMR guidance documents that were considered helpful to country work programs in their design and implementation of carbon pricing instruments included Designing Accreditation and Verification Systems; Emissions Trading Registries: Guidance on Regulation, Development, and Administration; and Emissions Trading in Practice: A Handbook on Design and Implementation. Guidebooks included Carbon Tax Guide: A Handbook for Policy Makers and Establishing Scaled-Up Crediting Program Baselines under the Paris Agreement.
Independent evaluation reports
To provide a contextual background for the PMR delivery processes, the first independent evaluation of the PMR, undertaken by the University of Southern California’s Development Portfolio Management Group (DPMG), and the second independent evaluation, conducted by Ipsos MORI and SQ Consult, were also considered.

LIMITATIONS and CHALLENGES
The lessons outlined in this report are subject to several challenges and limitations, mainly relating to knowledge gaps, PMR support causality, and the broader applicability of the observations from PMR country implementation. First, the comprehensiveness and quality of responses received in writing varied from country to country. Where the gaps were large, attempts were made to collect further information, either through additional phone interviews or discussion with country work program focal points in the World Bank. Second, as some PMR implementing countries also have received carbon pricing capacity-building support from other (national and/or international) institutions, the experiences and lessons learned from those countries may not be entirely attributable to the PMR. Finally, these lessons were largely derived from countries at an early stage of carbon pricing development. Some countries have started implementing carbon pricing pilots or are at an early stage of their rollout, while others have not even made firm decisions on the implementation of their carbon pricing instruments. Similarly, while some lessons captured from country work programs may only be simple observations, many others relate to the implementation of specific market readiness components, including how the countries addressed those challenges with the PMR’s support. Efforts were made to provide as much context as possible for each of the lessons captured, but some lack in-depth details as a result of insufficient information.
ANNEX II

Evolution of PMR

The PMR was officially launched in 2011. The Partnership Assembly (PA), the PMR’s decision-making body, first met that year, and 24 PAs in total have been conducted throughout its history. In these meetings, the PMR discussed various administrative and governance aspects, made decisions on implementing country market readiness proposals (MRPs) and disseminated knowledge on various technical elements of carbon pricing, for knowledge exchange and for networking among implementing country participants (ICPs) and contributing participants.

In 2013, the PMR created a new category of participant—the technical partner (TP)—to include countries and subnationals that were developing or implementing carbon pricing instruments and required specific technical support in the form of funding, expert advice, or both. The technical work program (TWP) was also launched in 2013 and provided systematic support for the sharing of best practices and lessons learned with countries and to build a common framework around technical areas where countries shared interests. The TWP generated industry best-practice guidebooks on different carbon pricing instruments—ETSs, carbon taxes, and domestic carbon crediting mechanisms—and how to select and adopt them; on using carbon revenues; and on how to maximize the development impacts of instruments; along with many associated technical reports. The program also developed e-courses and conducted facilitative courses, regional training, and numerous technical workshops, both at country and global levels.

In 2014, in response to emerging needs, the PMR achieved an important milestone by initiating Upstream Policy Analytical Support under the policy analysis work program (PAWP). The upstream policy support helped countries identify a package of effective and cost-efficient instruments to achieve mid- and long-term mitigation objectives. The support also complemented countries’ efforts to prepare their NDCs and INDCs for 2015 agreement under the UNFCCC. Also in 2014, the PMR launched a web-based platform for a “Roster of Experts,” which was used by PMR participants to identify technical experts to facilitate the development and implementation of their MRPs.

The PMR sought continually to improve its operations, based on feedback received from various stakeholders, mainly to maximize its impact on implementing countries, and by completing two independent evaluations, in 2015 and 2018. Based on the first evaluation, the Secretariat developed a new operations monitoring system to support the PA in efficiently monitoring the progress of the activities laid out in each
implementing country’s MRP and to share experiences and lessons learned through
them. Through the second, the PMR gained a better understanding of the countries’
evolving needs and how they should be considered in developing a new program, the
Partnership for Market Implementation (PMI).

Following the 2015 Paris Agreement, the PMR reached an important milestone in 2016
by concluding a first round of discussions on its strategic orientation and by endorsing
the criteria and process for the use of remaining funds until December 2020. That
same year, the PAWP expanded to include program- and country-level analytical work
and modeling support and to assess interactions between carbon pricing and other
policies. An ETS handbook was also launched, in collaboration with the International
Carbon Action Partnership (ICAP).

In 2017, the Secretariat instituted a log frame to measure and monitor its progress
based on the recommendations from the first independent evaluation of the PMR and
revised the original PMR objectives to make them more results oriented in a post-Paris
environment; it also launched the second independent evaluation of the PMR.

In 2019, the Partnership for Market Implementation (PMI) was announced to respond
to the needs of countries implementing carbon pricing instruments.

In 2020, the PMR allocated residual funds to the support of an additional 13 technical
activities. The additional activities were thematic in scope and useful to the wider PMR
community as it moved from readiness to the implementation phase. The PMI was also
officially launched in 2020.
## ANNEX III

### Country Milestones: MRV and Registry Systems

<table>
<thead>
<tr>
<th>PMR Country</th>
<th>Major milestones achieved with MRV system development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chile</td>
<td>Developed MRV for reporting and emissions quantification for its green tax system. During the additional phase of the PMR, implemented improvements on the green tax MRV, joining it with a system of reporting on atmospheric contamination broader than the scope of the tax. Additionally, the bases were developed for an MRV for mitigation actions in the energy sector, which then evolved into a conceptional design for a compensation (offsetting) system and the basis for a monitoring plan for carbon neutrality.</td>
</tr>
<tr>
<td>China</td>
<td>Completed enterprise data reporting and verification from 2013 to 2015 in eight sectors.</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>Developed SINAMECC 1.0, the mitigation module of a countrywide MRV system that is part of the National Environmental Information System (Sistema Nacional de Información Ambiental). The system includes a proof-of-concept MCCR (Costa Rican Offsetting Mechanism) registry to be used to test registry rules before a permanent platform is developed using distributed ledger technology. It also includes modules for the National GHG Inventory, the Biennial Update Report, a mitigation action database, the online platform for the National Carbon Neutrality Program, and a range of visualization tools.</td>
</tr>
<tr>
<td>Indonesia</td>
<td>Developed two national MRV guidelines for the power generation and fertilizer industry sectors, and the Ministry of Energy and Mineral resources issued a regulation concerning guidelines for inventory and mitigation of GHG emissions from the energy sector. A web-based MRV data management system in the power generation sector was launched in 2018.</td>
</tr>
<tr>
<td>Jordan</td>
<td>Developed an integrated national MRV system covering all sectors in the country and an associated climate change bylaw to support utilization of the system; supported a “productization” of the system that can be used by other countries.</td>
</tr>
<tr>
<td>Country</td>
<td>Details</td>
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<tr>
<td>-----------</td>
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</tr>
<tr>
<td>Panama</td>
<td>Institutionalized its MRV framework through an executive decree, including the GHG management system and mitigation actions registry, and designed a national decarbonization program, for which the national MRV framework is the central pillar. Both are strong market signals as to the vision of the country for carbon decarbonization and the potential implementation of market instruments to achieve these goals.</td>
</tr>
<tr>
<td>South Africa</td>
<td>PMR activities strengthened the Department of Mineral Resources and Energy’s central energy database (CED), supported the Department of Environment, Forestry, and Fisheries’ modification of the South African National Atmospheric Emission Inventory System (NAEIS), and developed the NAEIS-CED institutional setup and exchange protocols. The NAEIS modification allows for self-reporting by tax-liable entities of their GHG emissions. In addition, the PMR supported technical capacity building within the Department of Mineral Resources and Energy and the Department of Environment, Forestry, and Fisheries for the CED and South African Greenhouse Gas Emissions Reporting System (SAGERS) and funded stakeholder training on these systems.</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>Completed needs assessment and defined functional and technical specifications. Due to time constraints on developing the system from scratch, adopted the MRV system developed for Jordan with identification of specific customization requirements.</td>
</tr>
<tr>
<td>Tunisia</td>
<td>Conducted MRV of emissions in the energy sector and GHG emissions inventory for 2010–19 in compliance with the rulebook requirements, according to the updated IPCC methodology 2019.</td>
</tr>
<tr>
<td>Turkey</td>
<td>The Ministry of Environment and Urbanization implemented the whole MRV scheme for the first time under the PMR Turkey Project. As part of the pilot scheme, the MRV regulation and its guidelines were fully implemented at 18 electricity and 5 cement installations and 1 refinery installation.</td>
</tr>
<tr>
<td>Ukraine</td>
<td>Developed the MRV legal package and approved MRV law; prepared guidelines for calculation and reporting of GHG emissions, including several sets of templates for GHG emissions reporting; and prepared a basis for education and certification of GHG emissions verifiers.</td>
</tr>
<tr>
<td>Vietnam</td>
<td>Conducted analysis of the current database collection system and needs from line ministries before designing the MRV system for piloting sectors.</td>
</tr>
<tr>
<td>PMR Country</td>
<td>Major milestones achieved with registry system development</td>
</tr>
<tr>
<td>-------------</td>
<td>----------------------------------------------------------</td>
</tr>
<tr>
<td>Jordan</td>
<td>Developed the national registry system, mainly to support Jordan’s participation in the international market; supported the “productization” of the system for use by other countries</td>
</tr>
<tr>
<td>Mexico</td>
<td>Developed a simple emissions trading registry to serve the needs of the pilot phase of its ETS after analyzing pros and cons of an array of options, which included hiring the services of a commercial registry provider or developing a registry from scratch, in Mexico or overseas.</td>
</tr>
<tr>
<td>Peru</td>
<td>Developed the registry as a Software as a Service (SaaS) and is using it mainly to support participation in carbon markets.</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>Completed needs assessment and defined functional and technical specifications. Due to time constraints on developing the system from scratch, adopted the registry system developed for Jordan, with identification of specific customization requirements.</td>
</tr>
<tr>
<td>Turkey</td>
<td>Implementing the ETS transaction registry with the objective of establishing a platform with the fundamental functionalities of a registry system and developing the draft legal and institutional infrastructure for piloting an ETS. Registry software is currently under development and rules related to the registries under consideration.</td>
</tr>
</tbody>
</table>
# Key Characteristics of ETS in Selected PMR Countries

## Colombia

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coverage (sectors and gases)</td>
<td>Not available.</td>
</tr>
<tr>
<td>Cap set</td>
<td>Not available.</td>
</tr>
<tr>
<td>Allocation method</td>
<td>Not available.</td>
</tr>
<tr>
<td>Flexibility (use of offsets and credits)</td>
<td>Not available.</td>
</tr>
<tr>
<td>Compliance period</td>
<td>Not available.</td>
</tr>
<tr>
<td>Number of liable entities</td>
<td>Not available.</td>
</tr>
<tr>
<td>Implementation status</td>
<td>Under development.</td>
</tr>
<tr>
<td></td>
<td>(Pilot phase expected to start between 2023 and 2024).</td>
</tr>
</tbody>
</table>
### China

**Coverage (sectors and gases)**
Covers around 30% of national emissions or around 4 billion MtCO₂. Covers CO₂ only; limited to power sector (including combined heat and power, as well as captive power plants of other sectors), as of now.

**Cap set**
4,000 MtCO₂ (estimated for 2021).

**Allocation method**
Benchmarking, with four distinct benchmarks: conventional coal plants below 300 MW; conventional coal plants above 300 MW; unconventional coal; and natural gas.

**Flexibility (use of offsets and credits)**
Use of China Certified Emissions Reduction (CCER) already allowed, from 2021 onwards; covered entities can use offsets for up to 5% of their verified emissions from CCER projects in renewable energy, carbon sinks, methane utilization, and others.

**Compliance period**
One year.

**Number of liable entities**
2,225 (2021).

**Implementation status**
National ETS became operational in 2021.

### Kazakhstan

**Coverage (sectors and gases)**
Covers CO₂ only; power sector and centralized heating. Covers extractive industries and manufacturing: oil and gas mining, metallurgy, chemical, and processing industry (production of building materials: cement, lime, gypsum, and brick).

**Cap set**
The cap is set to 169.2 MtCO₂ in 2021.

**Allocation method**
Benchmarking (phase 4).

**Flexibility (use of offsets and credits)**
Domestic offsets in all economic sectors (GHG reduction or absorption activities), except for emissions reductions at the installations covered by the ETS.

**Compliance period**
One year.

**Number of liable entities**
130 companies (225 installations).
<table>
<thead>
<tr>
<th><strong>Mexico</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Coverage (sectors and gases)</strong></td>
</tr>
<tr>
<td><strong>Cap set</strong></td>
</tr>
<tr>
<td><strong>Allocation method</strong></td>
</tr>
<tr>
<td><strong>Flexibility (use of offsets and credits)</strong></td>
</tr>
<tr>
<td><strong>Compliance period</strong></td>
</tr>
<tr>
<td><strong>Number of liable entities</strong></td>
</tr>
<tr>
<td><strong>Implementation status</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Ukraine</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Coverage (sectors and gases)</strong></td>
</tr>
<tr>
<td><strong>Cap set</strong></td>
</tr>
<tr>
<td><strong>Allocation method</strong></td>
</tr>
<tr>
<td><strong>Flexibility (use of offsets and credits)</strong></td>
</tr>
<tr>
<td><strong>Compliance period</strong></td>
</tr>
<tr>
<td><strong>Number of liable entities</strong></td>
</tr>
<tr>
<td><strong>Implementation status</strong></td>
</tr>
</tbody>
</table>
## Key Characteristics of Carbon Tax in Selected PMR Countries

### Argentina

<table>
<thead>
<tr>
<th><strong>Tax Base (scope)</strong></th>
<th>Covers most liquid fuels and coal; all products with emissions factors (by heat content) higher than that of gas/petrol will be taxed at a uniform rate. Point of regulation: upstream.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>% GHGs covered</strong></td>
<td>20%</td>
</tr>
<tr>
<td><strong>Tax rate</strong></td>
<td>US$10/tCO₂e ($A541.5/tCO₂e), according to the conversion rate on April 1, 2021; changes quarterly with the consumer price index.</td>
</tr>
<tr>
<td><strong>Use of revenues</strong></td>
<td>Revenue is designated to multiple beneficiaries, including the National Housing Fund, the Transport Infrastructure Trust, and the social security system, among others. Revenue (2018): US$300 million (estimated).</td>
</tr>
<tr>
<td><strong>Measures to address competitiveness, leakage, and distributional effects</strong></td>
<td>Exemptions.</td>
</tr>
<tr>
<td><strong>Implementation status</strong></td>
<td>Enacted in 2018; effective from 2019.</td>
</tr>
</tbody>
</table>
## Chile

<table>
<thead>
<tr>
<th>Tax base (scope)</th>
<th>Covers installations emitting 25,000 tCO₂, or more, as well as those that release more than 100 tons of particulate matter into the air each year (Direct Emissions Approach). Point of regulation: midstream and downstream.</th>
</tr>
</thead>
<tbody>
<tr>
<td>% GHGs covered</td>
<td>39%</td>
</tr>
<tr>
<td>Tax rate</td>
<td>US$5/tCO₂e.</td>
</tr>
<tr>
<td>Use of revenues</td>
<td>No earmarking; revenues go to national budget; no policies to remove distributional impacts. Revenue (2020): US$165m.</td>
</tr>
<tr>
<td>Measures to address competitiveness, leakage, and distributional effects</td>
<td>Offsets in lieu of payment of the carbon tax; exemptions.</td>
</tr>
<tr>
<td>Implementation status</td>
<td>Carbon tax introduced as a part of General Tax Reform Bill 2014; carbon tax reformed in 2020.</td>
</tr>
<tr>
<td>Colombia</td>
<td></td>
</tr>
<tr>
<td>----------</td>
<td></td>
</tr>
<tr>
<td><strong>Tax base (scope)</strong></td>
<td>Covers different refined petroleum products, namely, natural gas, liquified petroleum gas, petrol, kerosene, and diesel and fuel oil; and the importer or producer of such products is the body responsible for paying the carbon tax to the government. Point of regulation: upstream.</td>
</tr>
<tr>
<td><strong>% GHGs covered</strong></td>
<td>24%</td>
</tr>
<tr>
<td><strong>Tax rate</strong></td>
<td>US$5.50/tCO₂e; set to increase annually by 1% plus inflation until the rate reaches approximately US$10/tCO₂; offsetting mechanisms allowed.</td>
</tr>
</tbody>
</table>
| **Use of revenues** | Earmarked “Fund Colombia in Peace” (investments in rural and environmental development projects). Revenue:  
  2017 - US$159m  
  2018 - US$98m  
  2019 (July) - US$95m  
  2020 - US$29.3m |
| **Measures to address competitiveness, leakage, and distributional effects** | Exemptions. |
| **Implementation status** | Introduced in 2016; effective from 2017. |
## Mexico

**Tax base (scope)**
Covers all fossil fuels excluding natural gas; Mexican carbon tax is an excise tax under the special tax on production and services. It is not a tax on the full carbon content of fuels but on the additional CO₂ emission content compared to natural gas.
Point of regulation: Upstream.

<table>
<thead>
<tr>
<th>% GHGs covered</th>
<th>40%</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Tax rate</th>
<th>US$3.70/tCO₂e; rates adjusted annually for general inflation; internationally recognized certificates of emissions reductions accepted.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Use of revenues</th>
<th>No earmarking; no policies to remove distributional impacts. Revenue: 2020 - US$229.8m</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Measures to address competitiveness, leakage, and distributional effects</th>
<th>Offsets.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Implementation status</th>
<th>Approved by the Congress in 2013; effective from 2014.</th>
</tr>
</thead>
</table>
**South Africa**

<table>
<thead>
<tr>
<th><strong>Tax base (scope)</strong></th>
<th>Covers GHG emissions from the industry, power, buildings, and transportation sectors, irrespective of the fossil fuel used, with partial exemptions for all these sectors. Point of regulation: upstream.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>% GHGs covered</strong></td>
<td>80%</td>
</tr>
<tr>
<td><strong>Tax rate</strong></td>
<td>US$9/tCO₂e as of April 1, 2021; various provisions of tax-free allowances; credits from CDM, VCS, and GS projects accepted to meet 5–10% of tax obligation in some cases; will increase until 2022 by the amount of consumer price inflation plus 2% annually. After 2022, only inflationary adjustments are envisioned.</td>
</tr>
<tr>
<td><strong>Use of revenues</strong></td>
<td>Soft earmarking—the use of carbon revenue is diversified (electricity levy reduction, support for energy efficiency and renewable energy, support for public and rail freight transportation, use of offsets). Revenue: 2020 - US$43.3m</td>
</tr>
<tr>
<td><strong>Measures to address competitiveness, leakage, and distributional effects</strong></td>
<td>Exemptions; offsets; support programs.</td>
</tr>
<tr>
<td><strong>Implementation status</strong></td>
<td>Effective from 2019.</td>
</tr>
</tbody>
</table>
## Ukraine

**Tax base (scope)**

Covers all fossil fuels used in stationary sources. Point of regulation: upstream.

**% GHGs covered**

71%

**Tax rate**

US$0.36/tCO₂; the Ministry of Finance and Ministry of Energy have recently proposed increasing carbon tax to €10/tCO₂, set to finance renewable energy based on feed-in tariff set in Ukraine in 2009, effective up to 2030, in accordance with the Ukrainian "Law on the Energy Industry".

**Use of revenues**

No earmarking; the proposed change to set carbon tax at the level of €10/tCO₂ establishes a mechanism that will provide funding to the guaranteed buyer to pay for renewable energy generated based on feed-in tariff. This will require the establishment of an RE Fund that will be financed from general budget revenue coming from carbon tax payments, or carbon tax payments will be directed to the RE Fund based on proposed changes to the RE law.

Revenue: 2020 - US$30.8m

**Measures to address competitiveness, leakage, and distributional effects**

Special budgetary programs, discussions on establishment of environmental fund and redirection of carbon revenues toward environmental protection goals, or establishment of RE Fund and directing of revenues to compensate for residential generation.

**Implementation status**

Effective from 2011.


15. Ibid.


