Market Readiness Proposal to the Partnership for Market Readiness

ARGENTINA

National Department of Climate Change, Ministry of Environment and Sustainable Development
6 April 2018 Draft
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<th>ADEERA</th>
<th>Asociación de Distribuidores de Energía Eléctrica de la República Argentina / Electricity Distributors Association of the Argentinean Republic</th>
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<td>AEA</td>
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<td>AGUERA</td>
<td>Asociación De Grandes Usuarios De Energía Eléctrica De La República Argentina / Electricity Large Users Association of the Argentinean Republic</td>
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<tr>
<td>BAU</td>
<td>Business as usual</td>
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<td>BEE</td>
<td>Bureau of Energy Efficiency [India]</td>
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<td>Balance Energético Nacional / National Energy Balance</td>
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<td>Compañía Administradora del Mercado Mayorista Eléctrico / Administrative Company for the Wholesale Electricity Market</td>
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<td>Carbon Offsetting and Reduction Scheme for International Aviation</td>
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<td>Distributed System Operator</td>
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<td>European Union</td>
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<td>GHG</td>
<td>Greenhouse gas</td>
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<td>GUH</td>
<td>Grandes Usuarios Habilitados</td>
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<td>Grandes Usuarios Mayores</td>
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<td>Grandes Usuarios Menores</td>
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<td>INDC</td>
<td>Intended Nationally Determined Contribution</td>
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<td>INDEC</td>
<td>Instituto Nacional de Estadística y Censos / National Statistics and Census Institute</td>
</tr>
<tr>
<td>IPP</td>
<td>Independent power producer</td>
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<td>ISO</td>
<td>International Organization for Standardization</td>
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<td>MATER</td>
<td>Mercado a Termo Energías Renovables / Regime for the Term Market for Renewable Energy Sources</td>
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<td>MAYDS</td>
<td>Ministerio de Ambiente y Desarrollo Sustentable / Ministry of the Environment and Sustainable Development</td>
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<tr>
<td>MEM</td>
<td>Mercado Eléctrico Mayorista / Wholesale Electricity Market</td>
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<tr>
<td>MINEM</td>
<td>Ministerio de Energía y Minas / Ministry of Energy and Mining</td>
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<td>Ministerio de Hacienda / Ministry of Treasury</td>
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<td>MINTRANSP</td>
<td>Ministerio de Transporte / Ministry of Transport</td>
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<tr>
<td>MoEFCC</td>
<td>Ministry of Environment, Forests and Climate Change [India]</td>
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<tr>
<td>MRP</td>
<td>Market Readiness Proposal</td>
</tr>
<tr>
<td>Acronym</td>
<td>Full Form</td>
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<td>---------</td>
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<tr>
<td>MRV</td>
<td>Monitoring, reporting and verification</td>
</tr>
<tr>
<td>Mtoe</td>
<td>Million tons of oil equivalent</td>
</tr>
<tr>
<td>MWh</td>
<td>Megawatt-hour</td>
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<tr>
<td>NCCC</td>
<td>National Climate Change Cabinet</td>
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<td>RE</td>
<td>New renewable energy sources</td>
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<td>OPEX</td>
<td>Operational expenditures</td>
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<td>PA</td>
<td>Partnership Assembly [of the PMR]</td>
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<td>Perform, Achieve, Trade [scheme]</td>
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<tr>
<td>PERMER</td>
<td>Proyecto de Energías Renovables en Mercados Rurales / Renewable Energies in Rural Markets Project</td>
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<td>PMR</td>
<td>Partnership for Market Readiness</td>
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<td>POSCO</td>
<td>Power System Operation Corporation [India]</td>
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<td>PPA</td>
<td>Power purchase agreement</td>
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<td>Renewable energy</td>
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<td>REC</td>
<td>Renewable energy certificate</td>
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<td>RENPER</td>
<td>Registro Nacional de Proyectos de Energías Renovables / National Registry for Renewable Generation Projects</td>
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<td>RO</td>
<td>Renewables Obligation</td>
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<td>ROC</td>
<td>Renewable Obligation Certificate</td>
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<tr>
<td>RPS</td>
<td>Renewable Portfolio Standard</td>
</tr>
<tr>
<td>SCEL</td>
<td>System of Certificates Management and Fulfillment of Renewable Energy Obligations</td>
</tr>
<tr>
<td>SDA</td>
<td>State Designated Agency [India]</td>
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<tr>
<td>SEMARNAT</td>
<td>Ministry of Environment and Natural Resources [Mexico]</td>
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<td>SENER</td>
<td>Ministry of Energy [Mexico]</td>
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<tr>
<td>toe</td>
<td>ton of oil equivalent</td>
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<tr>
<td>UNFCCC</td>
<td>United Nations Framework Convention on Climate Change</td>
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General information

PMR focal point

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The preparation of this Market Readiness Proposal (MRP) was carried out by the Ministry of Environment and Sustainable Development of Argentina (MAyDS) acting as Argentina's PMR Focal Point. PMR project is framed by a structured process overseen by the National Climate Change Cabinet (NCCC), chaired by the Chief of Cabinet of Ministers and technically coordinated by the Ministry of Environment and Sustainable Development. The NCCC is composed of 17 ministries, organized by sectorial roundtables. The NCCC structure and process represents the main mechanism for decision-making and climate actions validation in the country and PMR has been inserted in this overarch.

This MRP was endorsed by the Argentina PMR Task Group, composed by representatives of the Ministry of Environment and Sustainable Development, the Ministry of Energy and Mining, Ministry of Transport and the Ministry of Treasury. The PMR Task Group was designated by the NCCC to guide and implement MRP activities. The PMR Task Group, in turn, reports back to the NCCC on these activities.

The technical development was supported by a consultant consortium composed by Carbon Limits AS, South Pole and Fundación Bariloche, headed by Dr. Randall Spalding-Fecher. The development of the MRP was also coordinated with the World Bank team (the environment and energy units, respectively), and supported by PMR Secretariat.

MRP Development Team

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The MRP’s consultation process included two technical meetings with the PMR Task Group and technical representatives of each of the relevant Ministries to agree on the activities, to receive valuable feedback and suggestions and to prepare the draft MRP. Bilateral meetings were held with key representatives of the line Ministries for more detailed discussions on the draft.

**Additional officials and experts consulted during MRP development:**

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Following these two sets of consultations and discussions, Argentina submitted the draft MRP to the PMR Secretariat to perform the expert review process. The PMR Secretariat coordinated the expert review process with the support from the following external expert reviewers:

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<td>Independent Consultant</td>
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<tr>
<td>Mr. David Ryfisch</td>
<td>Gesellschaft für Internationale Zusammenarbeit (GIZ)</td>
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<tr>
<td>Mr. Guarany Osório</td>
<td>Getulio Vargas Foundation (Center for Sustainability Studies)</td>
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Upon receipt of the expert reviewers’ feedback, an Expert Review Meeting was then held in Argentina on 13-16 March 2018 to discuss and respond to the feedback received. The MRP was revised significantly based not only on this feedback, but also based on additional inputs received from the key staff in the MINEM, Ministry of Transport, Ministry of Treasury and MAyDS.
Executive summary

Argentina became an Implementing Country Participant of Partnership for Market Readiness (PMR) following the presentation of its Organizational Framework for Scoping of PMR Activities at the Partnership Assembly (PA) meeting in Hanoi in October 2016. The National Department for Climate Change under the Ministry of Environment and Sustainable Development (MAyDS), which is the PMR focal point for Argentina, has prepared this Market Readiness Proposal (MRP) with financial support from the PMR Preparation Phase Grant. The draft will be presented at the next PA meeting (PA18) in Kiev in April 2018. The objective of the MRP is to evaluate the feasibility of implementing carbon pricing instruments (CPIs) in Argentina and to outline Argentina’s roadmap for its proposed CPIs and market readiness components, as well as the timeline and budget required for implementation.

Chapter 1 (Building Block 1) of the MRP provides the overall policy context by laying out Argentina’s greenhouse gas (GHG) emissions by sector and key national policies, plans and institutional arrangements for climate change mitigation. Argentina is one of the largest economies in Latin America and is currently undergoing an economic transformation. The country has vast natural resources in energy and agriculture, being endowed with fertile lands and great potential for renewable energy, although currently its main sources of energy are oil and natural gas. Argentina has taken an active role on the international stage, holding the G20 presidency in 2018 and having expressed its intention to join the OECD. Within the G20, Argentina created a Working Group on Climate Sustainability to address the issue of climate change and has established the Energy Transitions Working Group to discuss energy issues.

One of the first decisions of the current national government was to create the National Climate Change Cabinet (NCCC) that revised the previous goal presented to the UNFCCC in 2015, with the aim to be more ambitious and transparent. Argentina submitted its revised Nationally Determined Contribution (NDC) on November 2016. It includes an absolute target to not exceed total national GHG emissions of 483 million tons of carbon dioxide equivalent (tCO₂eq) in 2030; and additional measures were calculated to reduce 114 million tons of carbon dioxide equivalent to 2030, in order to achieve greater ambition in the target, conditional on the availability of international financing, technical assistance and technology transfer.

Furthermore, during 2017 the NCCC developed three sectorial climate change action plans, presented in Bonn during COP23, for the energy, forestry and transport sectors. In 2018, Argentina expects to conclude the sectorial climate change action plans in industry, agriculture and infrastructure. These action plans will constitute building blocks of the development of a National Mitigation Plan and a National Response Plan to Climate Change.

Argentina’s MRP is focused on two new implicit carbon pricing instruments which have political support, synergies with both Argentina’s climate and energy sector policy goals and instruments, as well as extensive international experience. The first of these – Renewable Energy Certificates (RECs) – is presented in Chapter 2. This includes the policy context and mitigation potential for renewable energy in Argentina and a roadmap for designing and piloting the REC scheme. This would build upon the successful RenovAr public procurement program for renewable electricity generation and would support the achievement of the goals of for the Renewable Energy Law and Argentina’s NDC. The pre-feasibility analysis for the REC scheme would support Government’s decision on whether/how to move forward with this instrument by: screening appropriate modelling and analytical tools, including those already used by the Ministry of Energy & Mining (MINEM); identifying additional data needs; mapping barriers to
new policy instruments; modelling potential REC demand and market size; analyzing potential impacts on energy prices and potential interaction with other policy instruments; and, finally, engaging stakeholders to provide recommendations. Following a Government decision on whether/how to move forward to the next phase of instrument development, the design phase would cover the following areas: setting targets for the scheme (e.g. in light of the existing targets under the RE Law and the energy sector contribution to the NDC mitigation goals), developing additional tools for REC scheme MRV, promoting market stability, developing the appropriate institutional and regulatory frameworks, and setting up the necessary technical infrastructure. In addition, the MRP would include designing a pilot for the REC scheme.

Chapter 3 then presents a similar framework for developing an Energy Efficiency Certificate scheme, again first reviewing the policy context and mitigation potential for energy efficiency and creating a roadmap for designing and piloting the REC scheme. Not only could an EEC scheme help to capture the EE potential identifies in the Energy Scenarios 2030 analysis from MINEM and in the National Energy & Climate Change Action Plan, but it could also support any goals developed under the draft Energy Efficiency Bill when this becomes law. MINEM has a wide range of ongoing energy efficiency initiative that could provide data, institutional support and other policy synergies with an EEC scheme. Similar to the REC scheme, the pre-feasibility study for the EEC scheme would include modelling, policy analysis and stakeholder engagement to assess not only potential market size but also the impact on emissions, economic development and energy sector development. This analysis would support Government in deciding whether and how to move to the design phase for the scheme. The steps for the design phase would be similar, although the details of the institutional structures, data and MRV requirements, and regulatory framework would be different. A key question would be which end-user sectors would be the focus of the EEC scheme in its initial phase, as well as the whether it would focus on energy distributors and/or energy consumers.

Argentina’s recently approved carbon tax would be the subject of additional upstream policy analysis in Chapter 4, particularly understanding the potential impact of the tax and possible future extensions. In terms of impact, the analysis would include modelling the carbon tax’s effects and assessing the risks of ‘stranded assets’ in fossil fuel energy production and consumption. In terms of extensions of the current tax regime, after considering the pros and cons of the tax versus an ETS, activities would include: comparing the abatement cost and potential of different existing mitigation instruments; assessing the use of carbon taxes to replace current distortionary taxes; modelling options for expanding carbon tax coverage; developing an MRV system for the carbon tax; and assessing the need for border tax adjustments. In addition, both the REC and EEC scheme assessment and design components of the MRP would analysis how the carbon tax could affect the markets under these CPIs, to maximize the synergies among these different instruments.

Argentina is also considering how to use CPIs in the transport sector, so chapter 5 presents the policy context and mitigation potential in Argentina’s transport sector, and preparatory work to support decisions on future CPIs in this sector. The activities would include reviewing and assessing CPIs for the sector, based on international experience and Argentina’s policy goals, as well as assessing the pre-feasibility for potential high priority CPIs. This would also include an analysis of the relevance of the International Civil Aviation Organization’s Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) scheme as a possible source of demand for emission reduction units or credits from the Argentina, particularly from the transport sector. All of these activities would be preparatory work to support and inform policy decisions on carbon pricing and could lead to future work on developing CPIs for this sector.
Chapter 6 on cross-cutting activities outlines the proposed organizational and management framework for coordinating PMR grant-funded activities. In doing so, it maps out the main institutions and stakeholders that will contribute to the development and decision-making process of the market-readiness components described in the previous components. This chapter also identifies cross-cutting activities for communication, consultation and capacity building, which could be undertaken during the MRP implementation phase. The Monitoring & Evaluation activities will include identifying any delays in MRP implementation and proposing solutions and/or budget re-allocations to ensure that PMR support is used effectively.

Finally, chapter 7 together the activities and outputs from all components to present a combined timeline and budget for MRP implementation. Figure ES 1 shows the key outputs from the different components of the MRP.

**Figure ES 1: Overview of content of each component of Argentina’s MRP outputs**

<table>
<thead>
<tr>
<th></th>
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<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>2.1 Modelling and analysis to support decision on RECs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2 Definition of scope and target for REC scheme</td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.3 Design of overall REC scheme</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.4 Design a pilot phase for REC scheme</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.1 Modelling and analysis to support decision on EECs</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</table>

Table ES 1 presents an overview of the timeline, while Table ES 2 presents an overview of the budget for all components of the MRP. The budget estimates were developed from an analysis of the time and cost required for the various activities outlined in the individual chapters. For the two certificate mechanisms, the first output will support a decision by government on whether to move forward to the target-setting and design phases. In other words, the first deliverable would trigger a decision-making process on whether and how to move forward. The upstream analytical work on carbon taxes and transport sector could also potentially trigger additional activities, if budget is available. In addition, as discussed in Chapter 6, the budget allocations would be reviewed every six months and could be revised based on progress in different sectors and with different CPIs.
## Table ES 2: Overview of budget

<table>
<thead>
<tr>
<th>Outputs</th>
<th>Estimated support from PMR (USD)</th>
<th>Funding source (USD)</th>
<th>2018 (6 mo)</th>
<th>2019 (12 mo)</th>
<th>2020 (6 mo)</th>
<th>PMR</th>
<th>Government</th>
<th>Total</th>
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<td></td>
<td></td>
<td>70,000</td>
<td>70,000</td>
<td>0</td>
<td>140,000</td>
<td>14,000</td>
<td>154,000</td>
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<td>2.2 Definition of scope and target for REC scheme</td>
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<td></td>
<td>0</td>
<td>230,000</td>
<td>0</td>
<td>230,000</td>
<td>23,000</td>
<td>253,000</td>
</tr>
<tr>
<td>2.3 Design of overall REC scheme</td>
<td></td>
<td></td>
<td>0</td>
<td>247,500</td>
<td>82,500</td>
<td>330,000</td>
<td>33,000</td>
<td>363,000</td>
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<td>2.4 Design a pilot phase for REC scheme</td>
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<td>0</td>
<td>120,000</td>
<td>120,000</td>
<td>12,000</td>
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<tr>
<td>Sub-Total RECs</td>
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<td></td>
<td>70,000</td>
<td>547,500</td>
<td>202,500</td>
<td>820,000</td>
<td>82,000</td>
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<td></td>
<td>77,500</td>
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<td>155,000</td>
<td>15,500</td>
<td>170,500</td>
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<tr>
<td>3.2 Definition of scope and target for EEC scheme</td>
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<td></td>
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<td>0</td>
<td>230,000</td>
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<tr>
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<td>6,750</td>
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<td>Sub-Total EECs</td>
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<td>61,250</td>
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<td>665,500</td>
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<td>Sub-Total Carbon Tax</td>
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<td>103,333</td>
<td>0</td>
<td>155,000</td>
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<tr>
<td>Sub-Total Transport</td>
<td></td>
<td></td>
<td>51,667</td>
<td>103,333</td>
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<td>6.1 Project Management Task Force</td>
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<td>149,050</td>
<td>74,525</td>
<td>298,100</td>
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<td>6.2 Consultation, communication and outreach</td>
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<td>8,600</td>
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<td>8,600</td>
<td>34,400</td>
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<td>83,125</td>
<td>166,250</td>
<td>83,125</td>
<td>332,500</td>
<td>33,250</td>
<td>365,750</td>
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<tr>
<td>Total</td>
<td></td>
<td></td>
<td>494,792</td>
<td>2,054,583</td>
<td>450,625</td>
<td>3,000,000</td>
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Introduction

The Partnership for Market Readiness (PMR) is a grant-based, capacity building trust fund administered by the World Bank. It provides funding and technical assistance for the collective innovation and piloting of carbon pricing instruments (CPIs) that reduce greenhouse gas (GHG) emissions. The Partnership brings together developed and developing countries, as well as other key experts and stakeholders, to provide a platform for technical discussions on market instruments, South-South exchange, and collective innovation for pilot implementation and scaling-up financial flows.

The PMR implementing countries go through a two-stage process: the preparation phase and the implementation phase. During the preparation phase a Market Readiness Proposal (MRP) document is developed. The MRP lays out the country’s planned activities to develop the proposed CPIs and market readiness components to support those, as well as providing a timeline and budget estimates for implementation. The MRP is the basis upon which the Partnership Assembly (PA) decides on the level of PMR funding that is allocated to the Implementing Country. It therefore needs to provide a clear, detailed and convincing picture of why, how and where PMR resources will be used. Based on the PA’s approval, the Implementing Country implements the various activities presented in the MRP, including piloting the proposed CPI(s) where appropriate.

The Government of Argentina became an Implementing Country Participant of PMR, following the presentation of its Organizational Framework for Scoping of PMR Activities at the PA meeting in Hanoi in October 2016. The Climate Change National Department under the Ministry of Environment and Sustainable Development (MAyDS), which is the PMR focal point for Argentina, has prepared this MRP with the support of World Bank and is presenting the draft MRP at the next PA meeting (PA18) in Kiev in April 2018.

The objective of this MRP is to outline Argentina’s roadmap for its proposed CPIs and market readiness components, as well as the timeline and budget required for implementation. In the next stage of PMR support, the implementation phase, Argentina will carry out the readiness and policy instrument development components outlined in this MRP. The implementation phase will include preparatory and analytical work for inform decision-making on use of CPIs, as well as designing pilots for the proposed CPIs, as appropriate. It is expected that instrument’s implementation will be supported by PMR funding that is allocated by the PA.

This MRP is organized primarily around the different CPIs considered for Argentina, rather than the MRP Building Blocks, as outlined below.

- Chapter 1 (Building Block 1) – includes Argentina’s current national context (e.g. social and economic development), GHG emission levels and trends, pledges for mitigation, as well as existing carbon market experience.
- Chapter 2 (Renewable Energy Certificates) - presents the policy context and mitigation potential for renewable energy in Argentina and a roadmap for designing and piloting a Renewable Energy Certificate scheme as a CPI. This would start with a pre-feasibility analysis that would support Government’s decision on whether/how to move to the design phases of a REC scheme. Following this, key activities would include setting targets for the scheme, developing tools for MRV, promoting market stability, developing the appropriate institutional and regulatory frameworks, setting up the necessary technical infrastructure, and designing a pilot for the new CPI.
- Chapter 3 (Energy Efficiency Certificates - EECs) – similarly presents the policy context and mitigation potential for energy efficiency in Argentina and a roadmap for designing and piloting a EEC scheme as a CPI. This would also start with a pre-feasibility analysis that
would support Government’s decision on whether/how to move to the design phases of a EEC scheme. Following this, key activities would include setting targets for the scheme, developing tools for MRV, promoting market stability, developing the appropriate institutional and regulatory frameworks, setting up the necessary technical infrastructure, and designing a pilot for the new CPI.

- Chapter 4 (Carbon Tax) – includes activities on the potential impact of Argentina’s recently approved carbon tax, as well as possible future extensions. In terms of impact, the analysis would include modelling the carbon tax’s effects and assessing the risks of ‘stranded assets’ in fossil fuel energy production and consumption. In terms of extensions of the current tax regime, after considering the pros and cons of the tax versus an ETS, activities would include: comparing the abatement cost and potential of different existing mitigation instruments; assessing the use of carbon taxes to replace current distortionary taxes; modelling options for expanding carbon tax coverage; developing an MRV system for the carbon tax; and assessing the need for border tax adjustments.

- Chapter 5 (Transport) - presents the policy context and mitigation potential in Argentina’s transport sector, and preparatory work to support decisions on future CPIs in this sector. The activities would include reviewing and assessing CPIs for the sector, based on international experience and Argentina’s policy goals, as well as assessing the pre-feasibility for potential high priority CPI(s), including demand for credits from CORSIA.

- Chapter 6 (Cross-cutting activities: organization, management, communication, consultation and engagement – Building Block 5) - outlines the proposed organizational framework for coordinating PMR grant-funded activities. This chapter also identifies cross-cutting activities for communication, consultation and capacity building, which could be undertaken during the MRP implementation phase.

- Chapter 7 (Summary of Activities, Timeline and Budget - Building Block 6) – brings together the activities and outputs from the different components to present a combined timeline and budget for MRP implementation
1 Country context (Building Block 1)

This chapter describes Argentina’s current national context, including social and economic development, GHG emission levels and trends, pledges for mitigation, as well as existing carbon market experience.

1.1 Argentina overview

Argentina is located in the south of the American continent and extends over the islands of the South Atlantic and part of Antarctica. The country has a republican, representative and federal government, with a decentralized political organization. It is composed of 23 provinces and the Autonomous City of Buenos Aires. Buenos Aires province and the nearby provinces accounts for two thirds of the country’s population.

Argentina has a bicameral national congress, comprising the senate and the chamber of deputies. Legislative proposals are generally introduced in the chamber of deputies before debate and vote in the senate. To become law, all bills must be passed by both congressional bodies and signed by the president, who acts as both head of state and head of government. Some provinces have passed legislation directly or indirectly related to climate change.

The Argentinean economy enjoyed significant growth over the past decade. The gross domestic product (GDP) grew steadily following the 2001 economic crisis until 2008 – when it saw the effects of the international crises – and then from 2008 to 2011. Between 2011 and 2016 GDP has been more volatile, reaching USD 455 billion in 2015 (based on 2010 prices). Figure 1 shows the evolution of Argentina’s GDP from 2000 to 2016. Argentina is one of the largest economies in Latin America, with economic output based largely on industrial production and export-oriented agricultural sector. Argentinean exports are highly concentrated in agricultural products account for 63% of total exports.

Figure 1: Argentina’s gross domestic product, 2000–2016

![Graph of Argentina's GDP from 2000 to 2016](image)

Source: World Bank database

The country has vast natural resources in energy and agriculture, being endowed with fertile lands and great potential for renewable energy (RE). It is a leading food producer with large-scale agricultural and livestock industries, making it a relevant player in the context of global food security.

The presidential elections at the end of 2015 led to a significant change in Argentine economic policy. The new administration has implemented core reforms, such as eliminating the exchange restrictions, revisiting the agreement with international creditors, modernizing the import regime, reducing inflation, and reforming the national statistics system. Argentina’s country profile is shown in Table 1.

Table 1: Argentina’s national circumstances

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total surface (km$^2$)</td>
<td>3,761,810 IG</td>
</tr>
<tr>
<td>Continental surface (km$^2$)</td>
<td>2,791,810 IG</td>
</tr>
<tr>
<td>Population (inhabitants)</td>
<td>40,117,096 INDEC – 2010</td>
</tr>
<tr>
<td>Population density (inhabitants/km$^2$)</td>
<td>14.4 INDEC – 2010</td>
</tr>
<tr>
<td>Gross domestic product (pesos millions)</td>
<td>704,711 INDEC – 2016</td>
</tr>
<tr>
<td>Exports (pesos millions)</td>
<td>143,312 INDEC – 2016</td>
</tr>
<tr>
<td>Oil production (m$^3$)</td>
<td>30,879,676 MINEM – 2014</td>
</tr>
<tr>
<td>Natural gas production (dam$^3$)</td>
<td>41,484,025 MINEM – 2014</td>
</tr>
<tr>
<td>Power generation (MWh)</td>
<td>124,358,105 MINEM – 2014</td>
</tr>
<tr>
<td>Cattle (cow heads)</td>
<td>51,646,544 SENASA – 2014</td>
</tr>
<tr>
<td>Seed production (ton)</td>
<td>123,306,568 MINAGRO – 2014</td>
</tr>
<tr>
<td>Harvest surface (ha)</td>
<td>33,926,047 MINAGRO – 2014</td>
</tr>
<tr>
<td>Deforested surface (ha)</td>
<td>185,606 MAyDS – 2014</td>
</tr>
</tbody>
</table>

Source: MAyDS (2017d)

In terms of the energy sector, Argentina’s main sources of energy are oil and natural gas. According to the National Energy Balance (BEN), published by the Ministry of Energy and Mining (MINEM), in 2016 the total primary energy supply (TPES) was 80,060 tons of oil equivalent (toe), with natural gas and oil accounting for 86% of total TPES, as shown in Figure 2.

Figure 2: Argentina’s total primary energy supply, 2016

Source: Own elaboration based on information from MINEM – BEN 2016

Transport, households and industry are the most significant sectors in terms of final energy consumption, with the first of these depending on diesel oil, gas oil and naphtha, and the
other two relying on natural gas and electricity. The high Argentinean dependence on natural gas and oil is also clear in the electricity sector. According to information from the Administrative Company for the Wholesale Electricity Market (Compañía Administradora del Mercado Mayorista Eléctrico – CAMMESA) in 2016, 65% of total electricity was generated in conventional thermal plants, 27% in large hydro power plants, and 5.5% from nuclear plants. Despite the recent renewable policies and increased investments in renewable power plants, the share of the new renewable energy sources (RE) (i.e. wind power, solar PV, small hydro) in total electricity supply was just 0.4% in 2016.

**Figure 3: Argentina’s energy consumption by sector, 2016**

In terms of environmental policies, the right of all inhabitants to enjoy a healthy and balanced environment is stated by the Argentina’s National Constitution in article 41. This article declares the importance of the natural environment and its protection from contamination a national priority. It also vests the nation with the mandate to enact rules that establish minimum environmental protection standards, while the provinces can complement and extend environmental protection of natural resources in their territories. Constitutionally, each province has gubernatorial authority to legislate and control its natural resources, although the national government is granted authority to establish norms and standards for the protection of the environment.

In Argentina, the national government and the provincial states are coordinated members on the same level of participation, with neither subordinated to the other. In that sense, the institutional figure of COFEMA (Federal Council of the Environment) emerges as the main institution to coordinate the elaboration of the environmental policy among the sub-jurisdictions. It was created in 1990, to discuss the sub-national jurisdictions’ participation in the definition of environmental policies.

Argentina is exposed to numerous climate change risks and vulnerabilities. This is highly relevant for agriculture, given its prominence in the economy and its significant role in global food supply. The intensification of extreme events (intense rainfall, floods, droughts and heat waves) widens the year-to-year variability of production and compromises the stability of the
system, producing a high negative impact, both economic and social. Figure 4 shows the most important Argentina’s vulnerabilities resulting from the impact of climate change.

**Figure 4: Climate Vulnerability Map**

Source: (MAyDS 2017d)

To help in tackling climate change impacts, Argentina has shown positive developments in environmental policies. Internationally, Argentina has ratified the Paris Agreement, strongly committing to the global effort of emissions reductions. To fulfill its target, Argentina must take a variety of mitigation measures, which have become the responsibility of several ministries, through a structured process coordinated by National Department of Climate Change (NDCC).

Argentina has also taken on an active role on the international stage, holding the G20 presidency in 2018 and having expressed its intention to join the OECD. This is a cause for pride in Argentina and encourages the country to continue working actively in the search for solutions to the challenges posed by the G20 global agenda, among them the climate change issues. In that light, Argentina decided to create a Climate Sustainability Working Group (CSWG) and considers this a great opportunity to present a climate change agenda from the point of view of a developing country in the southern hemisphere. From the perspective of Latin America, it is an occasion to share best practices and challenges faced in the implementation of climate action in an inclusive manner. In addition, energy efficiency and renewable energy are the focus of the G20 Energy Transitions Working Group (ETWG)\(^2\), chaired by the MINEM, which was created to achieve cleaner, more flexible and more transparent energy systems.

Within the CSWG process, Argentina will strive to: (1) promote adaptation to climate change and extreme weather events with a focus on the development of infrastructure and on job creation; (2) foster best practices and mechanisms to develop long-term low-GHG emission development strategies; and (3) align international climate finance flows to the effective implementation of Nationally Determined Contributions (NDC) to climate change, and to low-GHG emission development strategies.

\(^2\) The first G20 Energy Efficiency and Renewable Energy High-Level Forum took place on 21 February 2018 in Buenos Aires, Argentina.
It is also worthy of mention that Argentina recognizes that carbon pricing policies are strongly connected with these objectives established under G20 process and play an important role in combatting climate change. Carbon pricing instruments tend to alter relative prices, give an economic signal and also stimulate clean technology and market innovation, all of which are needed to reduce emissions and internalize the costs of environmental damage. Carbon pricing instruments, combined with complementary mechanisms, have the potential to drive capital flows in the transition to a decarbonized economy and should be part of the toolbox for an effective climate policy.

1.2 Climate change policy framework

Argentina has ratified numerous environmental agreements regarding climate change. Among these are the United Nations Framework Convention on Climate Change (UNFCCC) in 1994 (Law 24,295), the Kyoto Protocol in September 2001 (Law 25,438), the Doha Amendment to the Kyoto Protocol in May 2015 (Law 27,137) and the Paris Agreement (Law 27,270) in September 2016. In this context, Argentina made a series of commitments to the fight against climate change and its effects. Figure 5 presents the timeline with the main national measures under the UNFCCC agenda.

Figure 5: Argentina’ progress under the UNFCCC

![Timeline of Argentina’s progress under the UNFCCC](image)

Source: (MAyDS 2017d)

Nationally, climate change policies have been coordinated by national government through the position of the Secretary for Environment and Sustainable Development, which was created in 2002. In 2003, the Climate Change Unit (currently the National Department of Climate Change – NDCC) was established within the Secretary of the Environment. However, since 2015, when President Mauricio Macri was sworn into office, the issue of climate change has taken a new dimension through a strategic approach, with strong political support and a commitment to meeting global needs in this regard.

Argentina, then, has shown positive developments in the climate change arena, lending great importance to climate change issues and incorporating it as a strategy into its planning for economic and social development. The environmental and climate change policy was hierarchized through the elevation of rank from secretary to Ministry of Environment and Sustainable Development (MAyDS), according to Decree 232/2015. Under this Ministry, climate change policies are addressed through the Secretary of Climate Change and
Sustainable Development which counts on the NDCC to promote climate change actions. The department’s main activities include the following:

- Propose and promote actions to the achievement of the objectives and goals contained in the UNFCCC.
- Elaborate the guidelines of the national climate change strategy.
- Assistance in the definition of mitigation and adaptation goals, strategies and programs, consistent with national sustainable development policies.
- Develop local awareness activities for mitigation and adaptation to change climate.
- Coordinate the elaboration of the national presentations to comply with commitments under the UNFCCC.
- Implement policies and regulatory measures on the production and consumption of substances that deplete the ozone layer.

Argentina has also made great strides in energy policy development, particularly in areas that are relevant for climate change mitigation. In December 2015 the former Secretary of Energy (which was part of the Ministry of Planning) was converted into the Ministry of Energy and Mining, recognizing the relevance of energy policy for the Argentinean sustainable development. As part of the reconfiguration, two new Under-secretaries were created that have strong links to climate change mitigation: the Under-secretary for Renewable Energy and the Under-secretary for Energy Saving and Energy Efficiency. In 2018, additional restructuring results in these two Undersecretaries reporting directly to the Minister. These Undersecretariats have led Argentina’s engagement in important international organizations such as International Partnership for Energy Efficiency Cooperation (IPEEC).

At the level of the provinces, COFEMA established the climate change commission in 2009, to discuss measures related to adaptation and mitigation to climate change among the sub-national jurisdictions.

Finally, to facilitate the adoption of climate change policies and to address the commitments posed by Paris Agreement, President Macri created the National Climate Change Cabinet (NCCC), described in the next section.

1.3 National Climate Change Cabinet

In 2016, the inter-ministerial NCCC was established by the presidential decree 891/2016, whose main objective is to define climate change policies across vertical and horizontal governance levels and to create awareness of the importance of mitigation and adaptation. It gathers together the main stakeholders involved with making climate change policy and coordinates the actions proposed by seventeen different ministries, facilitating the adoption of climate change policies and Argentina’s UNFCCC and Paris Agreement commitments. The NCCC aims to design comprehensive public policies with a strategic view to reduce GHG emissions and generate coordinated responses to the impacts of climate change. Climate change has thus acquired a new dimension and is being addressed through a strategic approach, with strong political support and a renewed commitment, considering both local and global needs.

The Cabinet is presided over by the Chief of Cabinet of Ministers and consists of seventeen ministries with competence in sectorial mitigation and adaptation policies. The Ministry of Environment and Sustainable Development, through its NDCC acts as the technical coordinator of the Cabinet. Table 2 shows the current composition of the NCCC. Each of the ministries is responsible for a set of GHG mitigation measures related to its competence; there are also some actions involving more than one actor in being implemented. The ‘Extended Roundtable’
of the NCCC brings participation of the provinces (through COFEMA), non-governmental organizations (NGOs), industry associations, private sector, academic and scientific sectors, and municipalities.

Table 2: National Climate Change Cabinet structure

<table>
<thead>
<tr>
<th>National Climate Change Cabinet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chair: Chief of Cabinet of Ministers</td>
</tr>
<tr>
<td>Technical coordination: Secretary of Climate Change and Sustainable Development</td>
</tr>
<tr>
<td>Members:</td>
</tr>
<tr>
<td>Ministry of Environment and Sustainable Development</td>
</tr>
<tr>
<td>Ministry of Energy and Mining</td>
</tr>
<tr>
<td>Ministry of Production</td>
</tr>
<tr>
<td>Ministry of Agro-industry</td>
</tr>
<tr>
<td>Ministry of Transport</td>
</tr>
<tr>
<td>Ministry of Social Development</td>
</tr>
<tr>
<td>Ministry of Foreign Affairs</td>
</tr>
<tr>
<td>Ministry of Education and Sports</td>
</tr>
<tr>
<td>Ministry of Culture</td>
</tr>
<tr>
<td>Ministry of Science, Technology and Productive Innovation</td>
</tr>
<tr>
<td>Ministry of Interior, Public Works and Housing</td>
</tr>
<tr>
<td>Ministry of Finance</td>
</tr>
<tr>
<td>Ministry of Treasury</td>
</tr>
<tr>
<td>Ministry of Public Finance</td>
</tr>
<tr>
<td>Ministry of Defense</td>
</tr>
<tr>
<td>Ministry of Health</td>
</tr>
<tr>
<td>Ministry of Security</td>
</tr>
<tr>
<td>Ministry of Tourism</td>
</tr>
</tbody>
</table>

On the basis of this platform, Argentina has reviewed its Nationally Determined Contribution (NDC) under the Paris Agreement, ensuring the commitment of each ministry responsible for mitigation measures and reflecting national efforts to increase the ambition of its commitment to fighting climate change. As such, Argentina is one of few countries that have increased the ambition of its NDC since the adoption of the Paris Agreement (NDC commitment will be further detailed ahead).

The NCCC has also been working to assess the impacts of each measure and designing specific roadmaps for each one, both mitigation and adaptation measures, to implement them. During 2017, three sectorial plans were developed and launched in Bonn during COP23: for energy and climate change, forests and climate change, and transport and climate change. Each of these establishes a specific emissions reductions goal and determines measures to accomplish it. Figure 6 shows the different goals and the number of mitigation measures, already validated by NCCC, set in each of them.

3 Available at: http://ambiente.gob.ar/planes-sectoriales/.
In 2018, Argentina expects to conclude sectorial climate change plans in industry, agriculture and infrastructure. These will constitute building blocks of the development of a National Mitigation Plan, to be published by the end of 2018. The effective implementation of these plans, with anticipated international support, will allow the country to meet its NDC mitigation objectives by 2030.

Moreover, the NCCC intends to move forward with a special focus on adaptation measures. A National Adaptation Plan is currently being developed within its framework and is to be launched by the end of 2018. It will include sub-national and sectorial chapters and will contain the priorities identified by COFEMA and relevant actors of civil society, academia and private sector. It is government’s intention to develop an ambitious plan to serve as an institutional base and conceptual framework for the development of local plans. The National Mitigation Plan and the National Adaptation Plan will form the basis of the National Climate Change Response Plan, which will include Argentina’s NDC implementation strategy, and identifying mitigation measures fully aligned with sector development policy objectives and priorities (see Figure 7).

The National Climate Change Response Plan, to be launched in 2019, will respond to Argentina’s climate change challenges by establishing two main objectives:

I. To identify, promote and implement measures to adapt to climate change, taking into consideration the impacts of climate variability, especially on particularly vulnerable populations, productive activities and ecosystems
II. To develop policies, measures and actions that contributes to GHG emissions mitigation, without compromising the country’s sustainable development.

It is intention of Argentina’s government to translate this plan into a bill to be sent to Congress for approval, with the aim of strengthening national climate policy.

Other expected NCCC tasks, besides the development of the National Climate Change Response Plan, include the development of a climate finance scheme and a national system of GHG inventories and monitoring of national contribution measures. The objective of this initiative is to track mitigation measures, the process to be managed by the NDCC.

It should also be noted that in 2016 the NCCC launched a climate risk platform, which is the first national interactive tool to identify the risks emerging from climate change, to help define policies related to climate change, land usage and infrastructure.

1.4 Historic and projects emission trends, and key drivers of the Argentina’s GHG emissions

As a UNFCCC Non-Annex I country, Argentina is required to submit a National Communication (NC) within three years of entering the UNFCCC, and one every four years thereafter. The objective of the NC is to provide information on GHG inventories, measures to mitigate and to facilitate adequate adaptation to climate change. To fulfill its commitments, Argentina has submitted three NCs so far, the first on 25 July 1997, with an unofficial revision in October 1999; the second on 7 March 2008 (with inventory data for 2000); and the third on 9 December 2015 (with inventory data for 2012).

Moreover, Argentina submitted two Biennial Update Reports (BURs) to the UNFCCC, the first in December 2015 (with inventory data of 2010) and the second in August 2017 (with inventory data of 2014) (MAyDS, 2017). BURs provide an update of the information presented in the NCs, on national GHG inventories, mitigation actions, constraints and gaps, including international support needed and received. It is to be submitted every two years.

Argentina’s GHG emissions have followed a growing trend, as shown in Figure 8. Energy, firstly, and, secondly, agriculture, husbandry, forestry and other land use have been historically the most relevant sectors for GHG emissions.

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4 Available at http://simarcc.ambiente.gob.ar/.
The main drivers of GHG emissions in Argentina are fossil fuels production, deforestation, livestock, and agriculture production, as shown in Table 3.

**Table 3: Key drivers of Argentina’s GHG emissions, 2014**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Value</th>
<th>Unit</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural gas production</td>
<td>41,484,025</td>
<td>Dam³</td>
<td>MINEM</td>
</tr>
<tr>
<td>Crude oil production</td>
<td>30,493,676</td>
<td>M³</td>
<td>MINEM</td>
</tr>
<tr>
<td>Stock of dairy cows</td>
<td>3,494,881</td>
<td>Heads</td>
<td>SENASA</td>
</tr>
<tr>
<td>Stock other cattle (meat)</td>
<td>48,151,663</td>
<td>Heads</td>
<td>SENASA</td>
</tr>
<tr>
<td>Deforestation</td>
<td>185,606</td>
<td>Hectares</td>
<td>MAyDS</td>
</tr>
<tr>
<td>Agriculture</td>
<td>33,926,047</td>
<td>Hectares</td>
<td>MINAGRO</td>
</tr>
</tbody>
</table>

Source: MAyDS (2017d)

Even though GHG emissions are growing, the rate of growth varies across sectors. In the case of agriculture, husbandry, forestry and other land use, volatility has been driven by the soybean boom, shifts in the agricultural frontier and, more recently, emission reductions as result of the Law 26,331, which established minimum budgets for environmental protection of native forests; as well as the impact of the national and international financial crises. Additionally, the consequences of some of the mitigation measures implemented since 2005 can also explain the pattern in this sector, whose emissions are mainly explained by drivers related to climate conditions, policies implemented and foreign external conditions (i.e. because most agricultural production is for export).

Sectors where emissions growth is primarily based on internal factors (e.g. GDP and population growth) have risen consistently, as exemplified in the increases in energy sector GHG emissions. Key factors influencing demand and supply include increasing energy demand related to the recovery of the economy after the economic crises and devaluation in 2001, and price and cost distortions in both demand and supply sides, as well as to the high share of hydrocarbons in TPES earlier mentioned. Between 1990 and 2012, emissions in the energy sector increased by 87% (from 103,464 to 193,477 Gg of CO₂e), while other sectors grew by only 25%. The share of the energy sector in total emissions thus increased from 35% to 52%. In this context, renewable power and energy efficiency, as well as other planned nuclear and hydroelectric investments, are very important for the future of Argentinean GHG emissions.
According to the BUR, in 2014, total GHG emissions recorded in the territory of Argentina was 368,295 Gg of CO₂e (see Figure 9). Energy, accounting for 53% (193,477 Gg of CO₂e) and agriculture, forestry and other land use (39%) are the most relevant sectors. In the former, transport (land), electricity generation, and residential and industrial fuel consumption are the most important components. In the latter, the most important sources are livestock and land use change and forestry.

**Figure 9: Argentina’s GHG emissions by major sector, 2014**

![Figure 9: Argentina’s GHG emissions by major sector, 2014](image)

Source: MAyDS (2017d)

In addition, 94% of emissions from energy sector correspond to fuel combustion activities and the remainder to fugitive emissions. Regarding the first, 30% comes from energy industries (mainly electricity production and heat); 29% from transportation (mainly road transport); 24% from other sectors (including residential emissions component); and 11% corresponds to emissions from fuel combustion in the manufacturing industry and construction sector (whose main component is the iron and steel industry). Table 4 summarizes energy sector emissions by sub-sector.

**Table 4: GHG emissions for energy sector**

<table>
<thead>
<tr>
<th>Category</th>
<th>tCO₂e</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy</td>
<td>193,477,00</td>
<td>100%</td>
</tr>
<tr>
<td>Fuel combustion activities</td>
<td>182,299,00</td>
<td>94%</td>
</tr>
<tr>
<td>Energy industries</td>
<td>58,340,00</td>
<td>30%</td>
</tr>
<tr>
<td>Manufacturing industries and construction</td>
<td>20,911,00</td>
<td>11%</td>
</tr>
<tr>
<td>Transport</td>
<td>56,929,00</td>
<td>29%</td>
</tr>
<tr>
<td>Other sector</td>
<td>46,119,00</td>
<td>24%</td>
</tr>
<tr>
<td>Fugitive emissions from fuels</td>
<td>11,178,00</td>
<td>6%</td>
</tr>
</tbody>
</table>

Source: MAyDS (2017d)

The next section will discuss the current main mitigation commitments and actions proposed to tackle the GHG increase trend shown above.

### 1.5 Argentina’s Nationally Determined Contribution

Argentina submitted its first NDC on October 2015, with an unconditional target to reduce GHG emissions by 15% below business as usual (BAU) by 2030, and a conditional target to
reduce them by 30% below BAU by 2030, including land use, land-use change and forestry (LULUCF). However, one of the first decisions of the current national government was to revise the goal, to increase its ambition in a feasible and sustainable way. Ambitious national action on climate change is central to achieving the Paris Agreement’s goal. The NDC revision was made based on the NCCC process by defining the potential mitigation measures of each sector and setting specific mitigation measures for each one.

The revised NDC was submitted to UNFCCC in November 2016, establishing an unconditional absolute emissions reduction target limiting emissions to 483 MtCO₂e by 2030. Argentina has also put forward a conditional target to limit emissions to 369 MtCO₂e by 2030. Figure 10 illustrates the revised Argentinean NDC.

Figure 10: Nationally Determined Contribution of Argentina

Source: (MAyDS 2017a)

The revised NDC was developed through a high-level political validation on the proposed measures to GHG mitigation. Numerous meetings were organized during 2016, and the NDC gained the necessary political and technical support and validation to become national policy. Thank to this participative process, Argentina was the first country in the region to present a revised NDC, increasing its ambition before the five-year period established in the Paris Agreement. Such a review was based on what is set out in article 4, paragraph 11, of the PA about increasing the level of ambition and providing more clarity, transparency and understanding to the contribution, according to decision 1/CP.21, paragraph 27.

At the national level, these commitments imply a work of coordination and incorporation of the climate change topic into national development and sectorial plans, thus promoting institutional strengthening and its incorporation at all levels of the national agenda. So far, legislation on climate change has been initiated through establishing NDC measures and developing sectorial plans, developed under the NCCC process described before.

1.6 Pledged mitigation measures and action plans for implementation

The Argentinean strategy to comply with its submitted NDC commitment is currently being undertaken with the development of sectorial actions plans, which establish mitigation contribution for each of the sectors. Currently, three of the six sectorial plans have already been developed: energy, forest and transport, and climate change; while sectorial plans regarding climate change and industry, agriculture and infrastructure are expected to be concluded in 2018.

These sectorial plans clearly state the strategy of each Ministry to implement the mitigation measures in the context of the Argentinean NDC, according to their respective national competencies. The distribution of the plans and mitigation measures is built on the idea that the capacity to manage GHG emissions falls mainly on the Ministries of Energy and Mining, Transport, Production, Agro-Industry, and Environment and Sustainable Development, as shown in Figure 11.
Moreover, each sectorial action plan presents a roadmap for each mitigation measure, including an analysis of barriers, regulatory and economic instruments to enable implementation, and the need for financing and specific actions to reach the sectorial objectives. In the same way, the roadmaps establish the indicators and the variables to allow monitoring of the implementation of the proposed measures and the results obtained. These roadmaps will provide a guide on priority measures and policies to reduce emissions in each sector and region, and each measure or policy will entail particular needs in terms of financial and technical means to be implemented.

The development of each of the sectorial plans included a combination of technical and participative methodologies and they are the result of a structured process in the framework of the NCCC. This process included several sectorial roundtables and a consultation process through an Extended Roundtable that includes private sector, civil society and academic groups. The consultation process allows the NCCC to inform key stakeholders about the mitigation measures to receive valuable inputs as well as to identify and evaluate the main barriers confronted by each alternative.

Through its participation in the PMR, Argentina is seeking support to further evaluate and possibly advance the design of enabling policy instruments that would support the implementation of mitigation measures identified in sectorial action plans, adopted by the NCCC and ultimately contribute to meeting the objectives set out in Argentina’s NDC, with a particular focus on the energy and transport sectors. This scope of work considers also the relevance of energy and transport sectors in GHG emissions national inventory.

In the next sections the main points of the relevant national sectorial action plans are presented, highlighting the mitigation targets established by each and the proposed mitigation measures to comply with the reduction commitment.

### 1.6.1 National Energy and Climate Change Action Plan

The energy sector’s role in GHG mitigation efforts is paramount to limiting climate change impacts. Considering that the energy sector is the most important driver in terms of GHG emissions in Argentina, according to the inventory classification, it has the greatest potential
for mitigation. In this context, the National Energy and Climate Change Action Plan was developed by MAyDS in partnership with the MINEM, also validated with the following strategic vision:

*By the year 2030, Argentina has implemented policies, actions and measures to ensure energy supply in a clean and sustainable manner, accompanying the productive and population growth while incorporating the responsible use of energy, promoting energy efficiency as a guiding principle, achieving a substantial reduction of GHG emissions and mechanisms of adaptation to climate change that reduce risk exposure and social vulnerability of energy systems.*

Specifically, the energy sector emissions on which the MINEM could have direct influence represent 28% of national emissions, totalling 106 MtCO₂e (see Figure 11). This amount resulted from a combination of the energy supply matrix, technology and consumption habits. To comply with reduction commitments established in the Argentinean NDC, several mitigation measures were settled by the MINEM that would allow an emissions reduction by 2030 of 77 MtCO₂e (of a total of 109 MtCO₂e). Thus, the energy sector is expected to contribute 70% of Argentina’s NDC. Furthermore, additional measures could increase, by 2030, total emission reductions to 101 MtCO₂e emissions reductions with external support (e.g. technology and finance).

**Figure 12: NDC emissions reductions for the energy sector**

![NDC emissions reductions for the energy sector](source: (MAyDS 2017b))

Energy efficiency measures related to productive sectors will be included in the National Industry and Climate Change Action Plan. In addition, the measures referred to the transport sector are not detailed in this plan, but in the National Transport and Climate Change Action Plan (described in the next section) developed and implemented by the Ministry of Transport. However, due to the relevance of energy consumption in transport, the Under-secretary of Energy Savings and Efficiency has a specific department for transport energy efficiency and is currently developing programs to promote energy efficiency and emission reduction in transport sector (see Chapter 3 for more information). Some examples of the programs undertaken by this department are: vehicle labelling, performance tests for heavy and light vehicles for the future creation of an Argentine standard of verification for fuel savings, freight transport efficiency and "Efficient Driving" training programs. Many of these activities are carried out jointly with the Ministry of Transport and several of them are part of the National Transport and Climate Change Action Plan. The latter is a clear evidence on how the three ministries work together in the development of the transport policy.

The mitigation measures considered in the National Energy and Climate Change Action Plan are structured along two central axes, corresponding to the supply and demand of energy, organizing sixteen different mitigation measures. Each of the measures has a mitigation potential estimate, based on parameters and assumptions, which are to be updated as better
data is gathered. Figure 13 illustrates the pack of measures in charge to contribute to the national emissions reductions.

![Figure 13: Energy sector mitigation measures](image)

Each of the measures are accompanied with roadmaps that contain a description of the measure and barriers to implementation and existing regulatory and economic instruments (or those necessary to enable its implementation) are identified. The roadmaps also reference existing and future needed financing for the proposed actions, as well as the indicators and variables that will enable monitoring progress towards compliance with the quantitative commitments. For the elaboration of the measures and roadmaps, a work team was established in the MINEM composed of internal focal points for the Under-secretariat related to each mitigation measure proposed. In this way, each competent area develops and monitors the measures under their control. In the case of grid-connected renewable energy, for instance, the plan has identified the existing barriers (e.g. limited transmission capacity and financing) and the current instruments under development by the MINEM to remove these barriers. The roadmap also contains some indicators to evaluate the performance of the policy (e.g. total renewable power generation by year, number of plants in operation). In the case of some household energy efficiency policies, the barriers have included lack of information and perverse incentives from the existing tariff structures. The roadmaps also identified other instruments for energy savings, labelling and regulations. In this context, the evaluation of CPIs or other economic instruments to support these actions would provide important additional inputs to the roadmaps. Through its participation in PMR, Argentina envisions assessing the feasibility of developing and implementing CPIs to support specific actions on EE and RE within this overall action plan.

Regarding the issue of jurisdiction, authority for renewable electricity generation belongs to the national government. Some provinces provide additional incentives, although these are smaller than programs like RenovAr. For instance, Neuquén and San Juan adhere to Law 27.191 by exempting RE projects from additional local taxes (e.g. gross income tax, seals and
real estate taxes)\(^5\). This positive approach at the provincial level would also make it easier to implement at RECs scheme.

### 1.6.2 National Transport and Climate Change Action Plan

In accordance with the commitments assumed internationally through the NDC, the National Transport and Climate Change Action Plan\(^6\) establishes a set of mitigation measures to be carried out by the transport sector in Argentina to promote activities that reduce GHG emissions. It was aligned with the following strategic vision:

> By the year 2030, Argentina has implemented policies, measures and actions in transportation to provide better conditions for the mobility of people and goods; reduce time and prioritize safety, comfort and sustainability, to substantially reduce GHG emissions and promote mechanisms of adaptation to climate change that reduce the vulnerability of the sector to the impacts of this phenomenon.

According to the inventory classification by the competent authorities, transportation emissions represent 15% of national GHG emissions, totalling 54 MtCO\(_2\)e (see Figure 11). Based on this figure, the mitigation contribution for the transport sector was defined as an emissions reduction of 5.9 MtCO\(_2\)e by 2030.

For the transport sector, the sectorial plan comprises eight measures: two for freight transport, and six for passenger transport (urban and interurban), accounting for a total goal of 5.9 MtCO\(_2\)e in 2030, representing a cumulative saving of 13.3 billion litres of diesel in the period. Figure 14 illustrates the transport sector contribution in terms of emissions reduction.

**Figure 14: Emissions reduction contribution from the transport sector in Argentina**

![Emissions reduction contribution from the transport sector in Argentina](https://example.com/figure14)

Source: (MAyDS 2017c)

To accomplish this objective and meet current and future needs for mobility of people and freight logistics, based on prioritizing environmental sustainability, the plan establishes eight mitigation measures, categorized into three main axes: (1) urban passenger transport, (2) intercity passenger, and (3) cargo transportation. Figure 15 presents the mitigation measures for the relevant sector and the correspondent percentage covered by each axis in relation to the total reduction target.

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As with the energy sector, Argentina’s MRP proposes to evaluate the potential of using sectorial carbon pricing instruments and mechanisms to promote and contribute to the implementation of the mitigation measures defined for this sector.

1.7 Emerging carbon-pricing instruments

1.7.1 Carbon tax

As part of a recent fiscal reform package, Argentina passed its first ever carbon tax into decree 1112/2017 that promulgates Law 27,430, on 28 December 2017. This was the first explicit CPI implemented by Argentina and it is at a very early stage. The carbon tax covers almost all liquid fuels (i.e. not jet fuel) and coal, but not natural gas, and equates to USD 10/ tCO₂e. The law differs from the Executive’s proposal in that it sets a lower price of carbon (USD 10 vs. USD 25/ tCO₂e) and that it excludes some fossil fuels (e.g. jet fuel, butane, propane and natural gas). This new carbon pricing mechanism is explained in more detail in Chapter 4.

1.7.2 Carbon market experience

Under the Clean Development Mechanism (CDM), Argentina has been participating in carbon markets, having registered a large number of projects in different areas. The mechanism allows emission reduction projects in developing countries to earn Certified Emission Reduction (CER) credits, which can be traded and used by industrialized countries to meet part of their emission reduction targets under the Kyoto Protocol. The development and presentation of projects in this scheme in Argentina, during the 2004–2008 period, remained constant with an average of four projects per year. As shown in Figure 16, an increase is recorded in the subsequent years, reaching a peak in 2012, prior to the expiration of the first commitment period of the Kyoto Protocol.
Figure 16: Argentina’s approved Clean Development Mechanism projects by sector

Argentina has had 60 CDM projects approved by Argentina’s Designated National Authority, of which 46 have been registered with the UNFCCC, while only 17 have issued CERs – for a total of 15,555 million CERs. Nineteen projects have reached validation but have not been registered. Of all the projects, only two (sanitary landfill and wind energy) corresponded to CDM Programs of Activities, with the remainder being individual project activities.

In this context, Argentina created in 2005 the Argentine Carbon Fund through an executive decree, with the purpose of trading carbon credits to fund projects within the CDM scheme. The fund activity was concentrated on advising private sector actors in the presentation of projects for CDM consideration.

At present, Argentina has experience with market-based instruments in mainly two ways: first, the international carbon markets through the CDM scheme; secondly, through its companies’ participation in voluntary emission reduction schemes. In the context of the voluntary markets, where Argentinean companies have generated credits that could be bought voluntarily by international companies or organizations to offset their own emissions, six projects were submitted to the Verified Carbon Standard (VCS) and 1 to the Gold Standard (GS). The types of projects are presented in Table 5.
Table 5: Voluntary markets Argentinean projects

<table>
<thead>
<tr>
<th>Year</th>
<th>Project</th>
<th>Project type</th>
<th>Registration</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>PER 1 and PER 2 Wind Power Plants (Umbrella Project)</td>
<td>Energy (renewable/non-renewable)</td>
<td>VCS</td>
</tr>
<tr>
<td>2010</td>
<td>MRTS SBASE, Argentina</td>
<td>Transport</td>
<td>VCS</td>
</tr>
<tr>
<td>2012</td>
<td>Los Caracoles Hydroelectric Project</td>
<td>Energy (renewable/non-renewable)</td>
<td>VCS</td>
</tr>
<tr>
<td>2011</td>
<td>Methane capture and destruction on Las Heras landfill project in Mendoza, Argentina</td>
<td>Waste handling and disposal</td>
<td>VCS</td>
</tr>
<tr>
<td>2009</td>
<td>Granja Tres Arroyos Methane Avoidance in Slaughterhouse Effluents Project</td>
<td>Waste handling and disposal</td>
<td>VCS</td>
</tr>
<tr>
<td>2009</td>
<td>Fuel-Switching Project from Fossil Fuels to Biomass in La Providencia, Arcor</td>
<td>Energy (renewable/non-renewable)</td>
<td>VCS</td>
</tr>
<tr>
<td>2015</td>
<td>Patagonia Verde</td>
<td>Afforestation / Reforestation</td>
<td>GS</td>
</tr>
</tbody>
</table>

Source: BUR, 2017

1.8 Conclusion

Scaling-up mitigation efforts in Argentina is a critical component of the country’s overall socio-economic transformation and commitment to sustainable development. With the completion of sectoral climate change action and plans, the National Mitigation Plan and the National Climate Change Response Plan in the coming two years, climate change mitigation will be increasingly integrated into all aspects of policy making and policy implementation. In addition, line ministries such as MINEM, Ministry of Transport and Ministry of Treasury are increasingly prioritizing strategies and programs with climate change mitigation impacts (e.g. the prominence of EE and RE in the structure and policies under MINEM). In this context, the MRP proposes to support the development of CPIs that support national policy goals and Argentina’s NDC commitments and sectorial roadmaps. This will include exploring policy options in the transport sector, evaluating options for possible expansion of the carbon tax, and studying implicit CPIs in the form of REC and EEC schemes.
2 Renewable Energy Certificates

This chapter presents the policy context and mitigation potential for renewable energy in Argentina and a roadmap for designing and piloting a REC scheme as a CPI. This would build upon the successful RenovAr public procurement program for renewable electricity generation and would support the achievement of the goals of the Renewable Energy Law and Argentina’s NDC. The component would start with a pre-feasibility analysis that would support Government’s decision on whether/how to move to the design phases of a REC scheme. Following this, key activities would include setting targets for the scheme, developing tools for MRV, promoting market stability, developing the appropriate institutional and regulatory frameworks, setting up the necessary technical infrastructure, and designing a pilot for the new CPI.

2.1 Preparatory work to support policy decisions on carbon pricing (Building Block 2)

2.1.1 Overview of policy context and mitigation potential in key sectors

This section summarizes the relevant policies in the energy sector that could reduce GHG emissions (directly or indirectly), as well as the institutions that administer them. The section also includes recent assessments of the potential for energy savings and for GHG mitigation. As discussed in Chapter 1, Argentina has been actively engaged in developing mitigation policies, plans and programs, even since before its commitments under the Paris Agreement. In addition to goals that are specifically related to GHG emissions, Argentina has also developed important sectorial policies and programs that will reduce GHG emissions even though this may not be their primary goal (i.e. the goal may be energy self-sufficiency, increased competitiveness, etc.).

The energy sector in Argentina has evolved significantly in the last decade, as the country has moved away from historical energy price distortions towards more cost-reflective prices, particularly for electricity and natural gas. Those distortions drove energy supply and demand for both electricity and other fuels and led to high energy import costs (ASAP and IAE 2015). In the last few years, the country has made progress in removing subsidies. Indeed, as a result of the gradual increases of tariffs, subsidies fell by 45.6% in real terms between November 2016 and 2017, implying a reduction of 67,276 million Argentinean pesos (equivalent to USD 4,252 million) (Instituto Argentino de la Energía 2018). However, the reduction in subsidies and the increases in energy tariffs resulted in price increases, leading to political and social resistance. It is evident that the increase generates Resistance, but objective is clear, the policy that advances in the sense of the normalization of the system and this contributes to the development of energy efficiency measures.

Argentina has a large potential for the development of RE, which contrasts with the relatively small share of these sources in the total installed power. Figure 17 shows the Argentinean power capacity by technology in 2016. More than 60% of total installed capacity comes from traditional thermoelectric technologies, close to 30% from large hydropower and only 2% from RE.
Despite the small installed capacity of RE, Argentina has a history of promoting renewable energies, which began in the late 1990s with a Law for the Promotion of Wind and Solar Energies. This Law was replaced in 2006 by a new regime for the promotion of renewable energies (Law 26.190) and more recently by the current Renewable Energies Law 27.191 and regulatory decrees 531/16 and 882/16.

Key aspects of the Renewable Energies Law and its regulatory framework are:

- **Target:** 8% of the electricity demand covered with RE in 2018, increasing to 20% in 2025.
- **Energy sources:** wind power, solar thermal, solar photovoltaic, geothermal, wave, ocean currents, small hydropower (<50MW), biomass, landfill gas, sewage treatment plant gas, biogas and biofuels.
- **Includes a regime for tax duty exceptions or consolidation of duties.**
- **Creates a public trust fund to provide guarantees and financing:** *Fund for the Development of Renewable Energies (FODER)*
- **Obligated purchasers of RE:** consumers in the wholesale electricity market with an average annual demand in excess of 300 kW must comply individually with the targets. This compliance can be achieved through joint purchases (i.e. purchasing renewable power from CAMMESA), corporate power purchase agreements (PPAs) in the private markets, either directly with independent power producers (IPPs) or with power traders or through self-generation projects.

According to internal estimates of MINEM based on different scenarios, to reach the 20% target by 2025, installed RE generation capacity must increase to 10 GW (generating 34 TWh) from a current base of only 800 MW (RenovAr, 2016). Transmission infrastructure must also increase accordingly (see Figure 18).
Another source, shown below, is the set of national energy scenarios conducted by the Under-secretariat of Energy Scenarios and Project Assessment. This study also projected planned power capacity for 2030. For the purposes of current analysis, the goal for the share of renewables is assumed to be similar across the target years for both sources (i.e. 2025 National Law N° 27.191 and 2030 for the national energy scenarios).

**Figure 19: Projected needs for new power generation capacity between 2017 and 2030, business as usual scenario**

Source: (MINEM – Under-secretariat of Scenarios and Project Assessment 2017)

**Governmental actions to address renewable electricity targets: the role of auctions**

In 2016, to speed up the process to address the target established in Law 27.191, the government implemented the RenovAr program. Through RenovAr, the awarded RE project companies enter into a 20-year PPA with CAMMESA, which acts as off-take aggregator on behalf of distribution utilities and different types of Large Users in the wholesale market. Under the PPA, RE project companies assume the obligation to construct and reach commercial operation within a timeframe set by each bidder in its bid. The totality of the electricity generated by the power plant is paid for at the awarded price, which is denominated in US dollars.

One of the most important incorporations of the Law 27.191 is the FODER, as it has been crucial for the recent performance of the public bid for auctions launched under RenovAr. Following the previous non-satisfactory performance of renewable regulation in Argentina and the other

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7 Business as usual is called the Trend Scenario in this national energy scenarios study.
bid for auctions (e.g. the GENREN plan), the main objective of the creation of the FODER is to provide investors with energy payment (liquidity) and termination payment (solvency) guarantees that enhance the legal framework under the current market conditions in Argentina.

The energy payment guarantee assures that the RE delivered to the grid at the point of interconnection under the PPA is duly paid for. The cost of the electricity is passed through to all eligible end-users and payments from such users are collected by CAMMESA through distribution utilities and/or large users. CAMMESA has the primary obligation to pay for the electricity on a monthly basis using the available funds it holds from regular collections and/or other transfers from the government. At a second level, in case CAMMESA is unable to pay in full for the electricity on the due date, FODER backstops CAMMESA (i.e. FODER guarantee plus sovereign guarantee). At the third level there is a Triple A guarantee provided by the World Bank.

**Figure 20: IBRD Guarantee Structure**

![IBRD Guarantee Structure Diagram](image)

Source: (World Bank 2018)

Up to 2018, the RenovAr program has held Round 1, Round 1.5 and Round 2. Also, in 2016 0.5 GW of legacy projects were reconverted to the new legal and contractual framework to allow access to the long-term financing needed to materialize them.

**Status of RE projects for joint purchases under RenovAr**

Implementing the investment committed in RenovAr and previous contracts will be of crucial relevance in complying with the targets of the Law 27.191 through joint purchases (i.e. long-term RE contracts made by CAMMESA). Up to the present, joint purchases include close to 5 GW of RE projects, half the power that has been estimated as needed to reach the target in 2025. These projects are:

- 88 RenovAr 2 contracts (not signed): 2,043 MW;
- 59 RenovAr 1 and 1.5 program contracts: 2,423 MW; and
c. 10 previous contracts (Resolution MINEM 202/2016): 500 MW.

Figure 21 shows a recent presentation made by CAMMESA (2017b) on future perspectives for joint purchases, considering the contracts that are signed versus those approved but not yet signed. It can be seen that full implementation of what has been bid so far, plus additional rounds of RenovAr, will be needed to reach the targets.

**Figure 21: Projected electricity demand covered by projects under the Joint Purchases option up to 2022**

Source: based on (CAMMESA 2017b)

The RenovAr program has already awarded 147 projects in 21 provinces for a total of 4,466.5 MW. There are 26 RenovAr 1 and 1.5 projects under construction and five already operate commercially (all corresponding to RenovAr 1). Figure 22 presents the structure of RenovAr projects according to the technology, where wind and PV have the greatest share of the contracts.
Figure 22: RenovAr 1, 1.5 and 2 capacity by energy source

The average price in RenovAr went from USD 61.33 per MWh in Round 1, to USD 53.98 per MWh in Round 1.5, reaching USD 51.48 per MWh in Round 2. The minimum prices reached by solar technologies show the most significant changes between rounds: they went from USD 59 per MWh in Round 1 to USD 40.44 per MWh in Round 2; wind went from USD 49 per MWh to USD 37 per MWh.

In addition to the RenovAr Program, some renewable capacity will be added in the framework of Resolution 202/2016: those projects that had been adjudicated in the framework of GENREN in 2010 and Resolution 108/2011. Resolution 202/2016 allows the MINEM to sign new contracts similar to those signed in the context of the RenovAr.

Finally, at least two RE projects for self-consumption are currently being developed by two important companies: Parque Eólico Manantiales Behr, a wind project (50 MW) from YPF to be installed in Comodoro Rivadavia; and 50MW of wind power for ALUAR to be installed in Puerto Madryn, Chubut.

**Status of obligated users under renewable energy laws**

According to Law 27.191, obligated users that have to comply individually with the targets are Large Users in the wholesale market, large distributors and self-generators – all of which have an average annual demand in excess of 300 kW (see Table 6).

**Table 6: Situation of obligated users – demand, average power and number of agents**

<table>
<thead>
<tr>
<th>Type of agent</th>
<th>Total demand 2016 [GWh]</th>
<th>Average power 2016 [MW]</th>
<th>N° entities</th>
<th>Total wholesale electricity market 2016 [GWh]</th>
<th>% obligated/total</th>
</tr>
</thead>
</table>

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Obligated users under the current regulation represent approximately 23% of the number of Large Users and 84% of Large Users’ electricity demand.

If an obligated user opts out of the joint purchases of RE power, it must specifically communicate this decision to the authority, stating the term in which it will be able to fulfil its obligations. Supply projects under individual contracts and self-generation options must be subscribed to the National Registry for Renewable Generation Projects, which is under the Under-secretary of Renewable Energies, and must be new projects entering after 1st January 2017 (Art. 3 of the Annex, Resolución 281-E/2017, MINEM, 2017). So far, only three obligated users have made use of these options. While the early rounds of RenovAr show signs of success, there are also some delays in implementation - which has also happened in other countries - mainly due to the difficulties the project developers have reaching financial closure. A REC scheme can support the objective of the national plan, making available a scheme that provides additional incentives, market data on renewable energy, and a reliable registry for buyers and sellers of renewable power. [As the rules for the markets go beyond the specific PP agreement between two single parties (Generator and Electricity user)]

In the case of self-generators, they must independently measure and audit the exchange of energy with the wholesale electricity market and the renewable power generated. There is a penalty if they cannot fulfil their commitments, since the remaining energy will be valued according to the cost of power generation with imported gas oil. An audit for large users that may not use the joint purchases option will begin in 2019.

It is important to note that the large users obligated by Law 27.191 may also have obligations under regulations to promote EE. In some cases, there may be overlapping of regulations that should be considered in detail when formulating new mechanisms and policies.

**Distributed energy market**

Argentina recently enacted Law 27.424 (Enacted by Decree 1075/2017), which establishes a regime for the promotion of distributed generation of RE integrated into the public electricity grid. This Law does not yet have a regulatory decree, but has two associated specific funds:

- **FODIS**, which will be able to provide resources and loans, subsidies or bonuses, as well as to establish incentives to the injection of power or to the acquisition of generation systems. It is also aimed at financing the dissemination, research and development related to applications of this technology.
- **FANSIGED**, which will promote related national industry, whose activities will be research, design, development, investment in capital goods, production, certification and installation services for the distributed generation of energy from renewable sources.
The gains from the injection of distributed electric power coming from renewable sources by the users with contracted power up to 300kw will be exempted from both income tax and value-added tax.9

**Isolated energy market**

One of the measures proposed by the sectorial action plan is the promotion of isolated renewable power generation in the framework of the Renewable Energy in the Rural Market Project (PERMER), which was first implemented in 1999. Recently, the government launched the second phase of the Project, with a call for tenders for about 120,000 off-grid renewable energy systems (mostly photovoltaic) to provide access to clean electricity for low-income people and schools in rural and isolated areas. A first phase of the project ran from 1999 until 2012 with financial support from the World Bank and the Global Environment Facility. During the first phase, 27,422 households and more than 2,000 schools were supplied with renewable energy and mini-grids. Renewable power installed under PERMER project is estimated to be in the order of a few MWs.

**PROBIOBASA**

The National Biomass Plan, PROBIOBASA, has importance in its own right, given the large role of agriculture, cattle-farming and forestry in the country. The program aims to increase production of electricity and thermal energy from biomass at the local, provincial and national levels to secure a growing competitive clean energy supply, open up agro-forestry opportunities, foster regional development, and mitigate climate change. The goals of the program are to mobilize investments of ARS 3,216 million (USD 0.16 million) to install 200 MW of electricity (under the jurisdiction of the MINEM and already included within the aims of the Renewables Law) and 200 MW of thermal power in 2016 and investments of ARS 25.7 billion (USD 1.3 billion) to install 1,325 MW of electricity and 1,325 MW of thermal power by 2030.

The estimated reductions from the implementation of these biomass energy plants are projected to be 1.2 million tCO₂e per year in 2016 and 8.3 million tCO₂e per year in 2030. However, if methane reduction is considered, by eliminating the decomposition of biomass under anaerobic conditions, emission reductions could reach an annual 9.4 million tCO₂e by 2016 just for avoided methane emissions.10

**2.1.1.1 Interaction of carbon pricing with other policies**

As has been extensively described and discussed above, the MINEM already has a strong plan for promoting RE under the RenovAr program to address the targets of Law 27.191 and the main objectives of the National Energy and Climate Change Action Plan. This makes it crucial to evaluate the interaction of the implementation of CPIs with existing plans (auctions, obligations, tax exemptions, and so on). In particular, to avoid overlapping incentives and instruments, one of the specific alternatives to be evaluated should be the implementation of the RECs as an

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additional instrument to promote RE investment (i.e. within or beyond their current obligations in terms of RE purchases), but only for those projects outside the RenovAr program.

An issue that should be considered as part of the feasibility of new CPIs is the possibility of overlap between RECs and EECs, where these schemes cover some of the same obligated entities. This will be particularly important if the alternative chosen for RECs is to use this instrument to incentivize large users while the EEC scheme is also applied to energy consumption by large industrial consumers.

Finally, although up to now there may not be significant interaction and overlapping between certificates and the carbon tax in its current configuration, it is important to note that this could yet evolve. A clear purpose of the carbon tax should be to increase the cost of fossil fuels, which would then increase the attractiveness of RE options and EE alternatives in all sectors. This could then impact the price and trading market for certificates. This would mean that, to maintain REC prices at a level that promotes new investment, the requirements for RE purchases would need to be increased over time to compensate for the increasing attractiveness of RE. In addition, if the tax revenue collected under carbon tax was used for programs that could support renewables, this would also need to be considered when setting the target levels for obligated entities under a REC scheme.

2.1.2 Analytical and modeling work on carbon pricing instruments and interaction with other policy instrument

2.1.2.1 Drivers of demand and market size

Certificate schemes are policy instruments like any other and intended to promote an increase in installed capacity for RE generation and to attain energy consumption reductions respectively. Also, as with any other policy instrument promoted by a country, they must be aligned with the objectives and commitments of the country; this means relying on such instruments for attaining targets in the most cost-efficient way possible, not only for the public sector but for all the actors involved.

For the specific case of a REC scheme, the most relevant demand drivers are the scope, the level of obligation, the penalty, and the target market. In the first place, the scope and coverage consist in deciding which participants of the national electricity market will be subject to the compliance mechanism: whether it will be any entity above a pre-stated demand capacity or whether, regardless of the size, specific sectors will be deemed to be the obligated entities. The level of obligation, usually linked to the target in absolute rather than relative terms, can be considered as the most important driver; therefore, it should be overseen and revised carefully to make sure the objectives of the instrument are met without impacting end-users, business competitiveness or the economy in general. Also, the penalty, usually considered the natural ceiling price, serves to enforce the whole scheme and to set a price signal for the incentive REC generators will be receiving throughout the life-span of the project. Finally, there are two potential demand sources for a REC scheme: the compliance mechanism centered on the set level of obligation, and also the possibility of enabling access to voluntary demand, comprising mainly global companies committed to procuring their electricity fully from RE sources.

In addition to the demand drivers mentioned above, there are other factors that affect the size of a certificate market. The institutional set-up is important, as an adequate arrangement should be set to enable an effective and efficient communication between participants, with a clear definition of the roles and responsibilities of each party, particularly with regards to the
oversight and monitoring and evaluation of the performance of the scheme. If the results obtained are far from the target, the scheme administrator should take corrective actions with the support of the policy regulator, the scheme operator and other parties involved on the continuous functioning of the mechanism.

Additionally, for the REC scheme, some key drivers of the market size are which technologies are eligible, pricing controls, penalty or buyout price levels, how collected penalties are used, and target markets for the scheme. Firstly, depending on the characteristics of each country, there can be an interest in promoting a specific type of technology, or projects commissioned from a particular year not covered by any other meaningful incentive; thus the eligibility criterion plays an important part of the market size as more resources could be redirected to technologies in a transition phase where more research and development is required rather than in more mature alternatives. Also, considering that the purpose of the REC scheme is to increase the competitiveness of the RE technologies in terms of cost equality by providing project developers with an additional incentive, it is important to assure, to a certain extent, that project developers will be entitled to an extra cash inflow. The impact of this incentive must enable interested investors accessing different financing sources by lowering technology-related risks. Moreover, the penalty price can serve to enforce the scheme or can be transformed into a buyout price to substitute the need of delivering certificates to comply with an obligation. Equally important is the final use of the financial resources collected from all the penalties paid by the liable entities. In the UK for example, the buyout fund redistributes the collected resources back to the parties that delivered Renewable Obligation Certificates proportionally to the number of certificates use in the fulfilment of their obligations, which even incentivizes the participants to purchase certificates above the buyout price. Finally, and as mentioned above, the potential scheme opening to a voluntary demand can have an important effect on the creation of new installed capacity in the country.

### 2.1.2.2 Scenarios for RECs market size and demand in Argentina

To estimate the potential market size for a REC scheme, it is useful to consider the goals of both the Renewables Law and Argentina’s NDC commitments, which provide context for renewable electricity development. First, in terms of the Renewables Law (27.191), reaching 20% of renewable electricity by 2025 would require 34 TWh of generation (i.e. based on 170 TWh total demand in that year), which would require almost 10 GW of RE power capacity (MINEM – Under-secretariat of Scenarios and Project Assessment, 2017). Second, in the analysis supporting the National Energy and Climate Change Action Plan, this 20% share of renewables is also required to meet Argentina’s unconditional goals for the energy sector of 77 MtCO2 emission reductions in 2030 (see Figure 12 in section 1.6.1). Based on further total demand growth to 211 TWh in 2030 (see Table 7), the required renewable generation would be 42.2 TWh\(^{11}\). For the group of obligated users under the current RE law, 20% of demand in 2025 and 2030 (see Table 7) would be 8.3 and 8.7 TWh, respectively.

\(^{11}\) Note that this almost the same as calculating this RE requirement based on the draft National Energy and Climate Change Plan, which estimates 2030 total demand at 231 TWh.
In terms of progress towards these goals, the combination of the three rounds of RenovAr auctions, projects commissioned prior to RenovAr, and projects supported by Resolution 202 (see discussion in section 2.1.1), if all fully implemented, will provide an estimated 19.3 TWh by 2025, which is just over half of the generation needed to meet the national RE goal for that year (see Table 8). While this amount of RE generation could meet the needs of the current obligated users, it would not meet the goals for the entire sector. This highlights the need for both additional capacity, which could be supported by additional rounds of RenovAr auctions and/or new policy instruments, to ensure that these goals can be met. Even if further auctions could meet future RE supply needs, the REC scheme might be able to provide the same supply with less burden on the public sector (e.g. because, under RenovAr, CAMMESA must pay the full additional costs of RE through the PPAs with project developers).

Table 8: RE Projects contributing towards joint purchases and the legal target

<table>
<thead>
<tr>
<th>Round</th>
<th>Power (MW)</th>
<th>Energy (TWh)*</th>
<th>% of total electricity demand in 2025**</th>
<th>% of legal target in 2025**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-RenovAr projects</td>
<td>700</td>
<td>2.6</td>
<td>1.5</td>
<td>7.7</td>
</tr>
<tr>
<td>RenovAr 1</td>
<td>1,142</td>
<td>3.9</td>
<td>2.3</td>
<td>11.6</td>
</tr>
<tr>
<td>RenovAr 1.5</td>
<td>1,282</td>
<td>4.3</td>
<td>2.5</td>
<td>12.6</td>
</tr>
<tr>
<td>Resolution 202</td>
<td>500</td>
<td>1.8</td>
<td>1.1</td>
<td>5.4</td>
</tr>
<tr>
<td>RenovAr 2</td>
<td>2,043</td>
<td>6.6</td>
<td>3.9</td>
<td>19.4</td>
</tr>
<tr>
<td>Total</td>
<td>5,667</td>
<td>19.3</td>
<td>11.4</td>
<td>56.8</td>
</tr>
<tr>
<td>27.191 Law target (i.e. 20% of final demand)</td>
<td>9,975</td>
<td>34.0</td>
<td>20.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Additional RE required to cover legal target in 2025</td>
<td>4,308</td>
<td>14.7</td>
<td>8.6</td>
<td>43.2</td>
</tr>
</tbody>
</table>

Notes: * Estimates of RenovAr 2 generation based on average capacity factors by technology from RenovAr 1, 1.5, and Resolution 202.
** Assumes all RenovAr projects in operation by 2025.
Source: own elaboration based on official sources: (CAMMESA 2018, 2017a; MINEM -Secretariat of Strategic Energy Planning 2017)\(^{12}\)

\(^{12}\) For more information on MINEM Scenarios please visit: https://datos.minem.gob.ar/dataset/escenarios-energeticos
The REC scheme, of course, would not cover the entire national demand, but only the portion of final consumption from the set of obligated entities covered under the scheme. This might be similar to the current coverage under the Renewable Energy Law, or it could be a larger or smaller group of consumers. To illustrate the potential market size, we consider a REC scheme that would cover the same group of Obligated Users (i.e. the 2070 consumers with more than 300 kW average demand) covered by the current Law, as discussed above. Again, the RE targets for this group under the current law would be 8.3 TWh and 8.7 TWh in 2025 and 2030, respectively, or which part could be met by a REC scheme.

Two possible scenarios for how a REC market could be used within this consumer group would be (a) to assist obligated users to meet their current goals under the RE Law (i.e. assuming that not all of the contracted RenovAr supply can be used by these obligated users and/or that they are not able to self-generate enough RE or purchase it directly from independent power producers); and (b) to assist obligated users to go beyond the current targets in the Law. As an example of the first option, if a REC market were used to meet the roughly half of the current obligated users’ target, this would be just under 4.1 TWh and 4.4 TWh of RECs in 2025 and 2030, respectively. As an example of the second option, if a REC scheme were used as an instrument for obligated entities to move from a goal of 20% of electricity demand to 25% in 2030, this additional 5% of RE obligation would be a REC market of 2.2 TWh in 2030. In other words, under these scenarios, the REC scheme could contribute 5-10% of the entire power sector RE development needed as part of the unconditional goals included in the National Energy and Climate Change Action Plan (i.e. 2.2-4.4 TWh / 42.2 TWh). This is, of course, based on a very conservative estimate of coverage for the REC scheme, because it would be used for the entire RE target and could also be applied to a larger target group.

2.1.3 Presentation of plan and sequencing of analytical and modeling work to support decision-making

This section introduces first output for RECs, and the related activities, as part of a work plan to support decision-making by government on carbon pricing instruments. The section explains the analytical and modelling work that would be needed for government to decide whether to move to the design phase for a REC scheme.

For the REC scheme, certain policy analysis and modelling activities are necessary to as preparatory work to support and inform policy decisions. The first proposed deliverable for RECs would therefore be a ‘Renewable Energy Certificate Pre-Feasibility Study’. Government would use this study, among other inputs, to make a decision on triggering the next phase of instrument development, described in section 2.2. The Pre-Feasibility Study would address the following issues:

- Identifying appropriate modelling and analytical tools: This is intended to determine which would be most appropriate to modelling the economic, energy and emissions impacts of REC schemes. The choice of tools would be related to, among other issues, expected data availability.
- Creating high-level scenarios: Given that there is a range of options for scope, market, type of obligation, goals/targets (e.g. using existing targets or going beyond those targets), among other features for the scheme, create some scenarios that cover combinations of desirable and feasible key parameters for purposes of mapping the universe of possibilities fitting the own circumstances of the country.
• Modelling potential demand and market size: For the high-level scenarios, estimate how different decisions on the scope, target level, etc., of scheme would affect the market size of RECs.

• Mapping barriers to RE: Synthesize previous analysis of possible barriers for the development of the REC scheme and propose solutions or risk mitigation actions as well as identifying what other measures outside of the scheme may be needed to overcome these barriers. This includes the challenges facing some RevnovAr projects on financial closure, and the consequent delays in commissioning new RE power. This analysis would also feed into the stakeholder engagement discussed below.

• Assessing the potential impact of RECs on energy prices: Assess the interaction between certificate scheme and energy prices, in light of the recent increases in energy prices for many consumer groups. This would include a high-level evaluation of how RECs might affect consumer inflation and energy prices. A more detailed macroeconomic and socio-economic analysis would be conducted under later outputs on RECs.

• Analyzing the potential interaction with other policy instruments: Analyze how the carbon tax could influence the market for RECs and evaluate the potential impact of added costs for obligated entities under the REC scheme (e.g. indirectly through fossil fuel energy price changes).

• Identifying data needs: Identify what further data will need to be collected to conduct a feasibility study. This could include an overview of the data requirements for existing policy instruments, developing/updating a database with all generation facilities and major consumers, quantifying existing off-grid generation capacity, assessing nation-wide potential for new RE by technology type, and collecting financial information on costs of new capacity for different types of technologies. The National Useful Energy Balance, depending on how far it has been developed, could also provide useful inputs on the evaluation of future demand at obligated entities (see details of this tool in the Energy Efficiency section).

• Engaging stakeholder groups: Identify which key stakeholders should be consulted in the process of designing the scheme. The stakeholders to be considered during this ‘pre-feasibility’ phase may include not only the MINEM, but also other institutions such as (see list of acronyms earlier) CAMMESA, CADER, INTI, Fundación Di Tella, CEAR and other academic institutions involved with the evaluation of RE scenarios, AAE, ADEERA, AGUEERA, UIA, other institutions involved with Large Users and residential users, Wind Argentine Cluster, and the Argentine Chamber of Solar Thermal Manufacturers.

• Providing recommendations on next steps: Develop and present recommendations on whether/how to proceed with RECs starting from the current regulatory framework to the mechanism design phase and to more advance stages until its implementation. Also, facilitate a discussion among government and other relevant stakeholders on these recommendations, as well as the opportunities and risks of a REC scheme.

The key proposed output for this component in the MRP is:

• Output 2.1: Modelling and analysis to support decision on REC scheme as a CPI. The work to deliver this output is presented in Figure 23 and summarized in section 2.3.
2.2 Market Readiness and Instrument Design (Building Blocks 3 & 4)

As part of developing a complete roadmap for a REC scheme for Argentina, each section of this chapter addresses specific design issues and the activities required to move towards studying the implementation of a customized REC framework. Section 2.3 then summarizes all the proposed outputs, activities, timeline and budget. The discussion is based on both Argentina’s situation and the experience of other countries with REC schemes (see Annex A).

The following are some of the take-away messages from international experience that are important to consider in the design of a REC scheme:

- RECs provide a transparent instrument for obligated entities to fulfil their RE targets and can do so cost-efficiently by relying on market dynamics to determine certificate prices.
- The effectiveness of the scheme can be diluted by an oversupply of certificates.
- Not all RE technologies may be stimulated equally with the same price per certificate or by granting the same number of certificates for all the technologies; nonetheless, issuing one certificate per MWh produced from renewable sources can reduce the complexity of the scheme.
- Through this mechanism, the public sector does not have an obligation to guarantee a profit for the project developers, as the incentive that project developers will be entitled to will vary with the market. The public sector’s aim is, rather, to help the scheme to be stable, with time for project developers to have certainty about the incentive they will receive in the future and for the obligated entities to estimate in advance the financial impact of the scheme.
- The instrument effect can be increased by enabling the participation of voluntary entities.
- To preserve the integrity of the scheme, ‘double counting’ risks must be overseen closely, ideally by putting in place mechanisms that reduce the possibility of using the attributes related to a certificate twice (Jones, T. 2017).
Table 9 highlights key parameters to be considered when designing a REC scheme, and also indicates in which section of this MRP these issues are addressed. The choices under each heading will depend on national circumstances, goals and market structure, among other things.

Table 9: REC scheme key design parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Options</th>
<th>MRP section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market type</td>
<td>Compliance, voluntary or a combination.</td>
<td>2.2.1 and Annex A</td>
</tr>
<tr>
<td>Scope</td>
<td>Size of obligated entities.</td>
<td>2.2.1 and Annex A</td>
</tr>
<tr>
<td>Institutional set-up</td>
<td>A single scheme administrator, collaboration between an administrator and operator, cooperation between different public entities and/or a combination between public entities and outsourced organizations (e.g. for registry operation).</td>
<td>2.2.4 and Annex A</td>
</tr>
<tr>
<td>Obligation measurement</td>
<td>Fixed, dynamic, and/or differentiated per technology type (e.g. separate sub-target for solar).</td>
<td>2.2.2 and Annex A</td>
</tr>
<tr>
<td>RE technology eligibility criteria</td>
<td>Technology type, commissioning date, geography, maximum allowed capacity (e.g. hydro &lt; 50 MW).</td>
<td>2.2.1 and Annex A</td>
</tr>
<tr>
<td>Pricing controls</td>
<td>Floor price (e.g. minimum auction price), ceiling price (e.g. penalty), or no price controls at all.</td>
<td>2.2.3 and Annex A</td>
</tr>
<tr>
<td>Flexibility mechanisms</td>
<td>Certificate lifespan, certificate banking, and obligation carry-over.</td>
<td>2.2.3 and Annex A</td>
</tr>
<tr>
<td>Environmental integrity</td>
<td>One single registry, multiple registries, third-party auditing process requirement, and linkage with other policy instruments registries.</td>
<td>2.2.2, 2.2.3, 2.2.5 and Annex A</td>
</tr>
<tr>
<td>Compliance options</td>
<td>Certificates only, a fine only (as the ‘buy-out’ price in UK), or both.</td>
<td>2.2.3 and Annex A</td>
</tr>
<tr>
<td>Trading options</td>
<td>Auctions, bilateral contracts, and through power exchanges.</td>
<td>2.2.3, 2.2.5 and Annex A</td>
</tr>
</tbody>
</table>

### 2.2.1 Target-setting and scope

REC schemes are one of the instruments a given jurisdiction can use to promote an increase in installed capacity for RE generation and to attain its emission reduction objectives. If the RE target by obligated entities is set too low, there will be a surplus of certificates, dragging down the price to a level that the instrument will no longer represent an incentive for new RE installed capacity. Conversely, if the target is set too high there will be a scarcity of certificates, therefore driving up certificate prices and ultimately increasing electricity prices for consumers. Further, the REC scheme can promote innovation, research, and development in RE generation sources if a differentiation per type of technology is featured into the scheme (e.g. technology specific carve-out), thus granting a higher incentive to higher risk energy sources.

Another key aspect when setting a target is whether the REC scheme will be open to voluntary participation. This would mean that, in addition to obligated entities, voluntary participants, mostly driven by a sustainability commitment and/or their view of a differentiated product offering for new markets, are also allowed to purchase certificates. REC schemes have tackled the voluntary market demand in different ways. Some allow the same instrument to be used for both compliance and voluntary purposes, while some others use a new type of certificate to serve as proof that each electricity unit comes from a renewable source.

The introduction of a voluntary demand can do the following:
Open new opportunities for local customers seeking to minimize the negative environmental externalities linked to their electricity consumption.

Enable electricity consumers to have access to renewable electricity even in locations where there are a limited number of generation technology options.

Allow end-consumers (e.g. global corporations) to claim the use of renewable electricity.

Additionally, if a voluntary market is considered as part of the scheme, some general conditions for a credible voluntary RE claim include the following:

- No double counting (i.e. the same instrument is not used twice for making GHG emission reductions or carbon neutrality claims).
- Full attribute aggregation (i.e. all the attributes of the electricity are bundled in one single instrument).
- Voluntary demand for RE should be additional to what is required by law (Jones, T. 2017).

In terms of what this means for Argentina, Law 27.191 establishes the RE targets to be addressed with renewable power from 2018 to 2025. This target is the core feature that frames all existing RE policies (e.g. RenovAr Plan). While investment plans may be sufficient to address the target, significantly more capacity must be commissioned than what is available so far. In this regard, as mentioned before, one option for RECs would be as an additional instrument to go beyond the ambition of the current RE target in Argentina. In this case, deciding on this more ambitious target would require consideration of a broad range of criteria, from changing technology costs for renewables, to resource availability in Argentina, to the availability characteristics of different technologies (e.g. the dispatch potential for reservoir hydro versus intermittently available resources such as solar and wind), and – perhaps most importantly – the potential impact on electricity tariffs. Increasing penetration of solar, wind and other intermittent technologies could also have implications for transmission and distribution investments. Currently, for example, there is a transmission plan based on the needs for RenovAr 1, 1.5 and 2. These should be considered as part of the total cost of introducing more intermittent technologies. On the other hand, the non-financial benefits of these technologies (e.g. lower local air pollution, increased employment from more labor-intensive local manufacturing, improvement in the trade balance) should also be considered.

The other alternative, not necessarily mutually exclusive from the first, that could be evaluated would be using RECs as a means for obligated entities to fulfill (some portion of) their current commitments. To make this decision would require additional research on the development of the RE pipeline, what barriers these projects face, and how likely the different investments are to be commissioned on time.

The following activities are proposed to determine the targets, scope and coverage for Argentina’s REC system:

- **Develop a renewable electricity supply curve for Argentina**, based on local project data and international benchmarks for project cost, to illustrate the potential (microeconomic) costs of different levels of renewable electricity development within a specific time frame. The supply curve would show the range of renewable electricity options available in Argentina, organized based on their total generation potential (MWh/yr) and their cost of generation (USD/MWh) (average costs as well as incremental cost above average wholesale electricity prices). An example of an electricity supply cost curve for all generation technologies is shown in Figure 24. A similar curve could be developed for Argentina, but specifically for...
renewable electricity options, to estimate the total cost of achieving different targets. This could also be done for investment costs (USD/MW) instead of just average costs, to assess the total investment and financing requirements for different renewable energy targets. The analysis would include understanding the dynamics over time, as the costs of RE decline and the cost curve therefore shifts, and how this would relate to longer-term targets. In addition, the incremental costs of transmission and/or storage that might be required to facilitate more intermittent electricity sources should be considered in the cost structure for the broad range of technologies analyzed. This analysis will draw upon that other tools and datasets used by the MINEM (e.g. the Energy Scenarios studies) for the evaluation of the options for RE.

**Figure 24. Example of an electricity supply cost curve (for biomass)**

![Electricity Supply Cost Curve](https://www.nature.com/articles/nclimate2488)

Source: https://www.nature.com/articles/nclimate2488

- **Analyze options for scope and target for the REC scheme:** Analyze the rationale for the choice of specific actors/sectors/sub-sectors, and model the impact of the choice of sub-sectors and the target level on RECs market size, certificate demand and possible price levels, based on the following quantitative and qualitative considerations:

  - energy consumption data for large users and distributors, and the implications of this for different target levels;
  - impact of increased penetration of intermittent RE on grid stability and technical operations, as well as the peaking versus baseline capacity of different technologies;
  - implications of targets for transmission needs, particularly if targets will be beyond current requirements;
  - implications of different sub-targets for different RE technologies;
  - opportunities for self-generation in different industrial sub-sectors;
  - interaction of the REC market with existing support for RE under the RenovAr program;
  - impact on total REC demand from including voluntary market demand; and
  - potential broader macroeconomic impacts of the alternative target levels for RE (e.g. employment, trade balance).
Facilitate stakeholder engagement on setting targets: The results of the renewable electricity supply curve analysis, analysis of different metrics for REC targets, and analysis of the scope and coverage options would be presented to key stakeholders, whose input could inform the government decision on a target trajectory and scope for the RECs scheme.

2.2.2 MRV, data and compliance

Depending on the scheme rules, obligated entities may comply with their RE quotas in different ways. The participation of more actors in the scheme does not depend only on the market price signal, but also on how the scheme is administered and the controls set to ensure transparency and accuracy in the results. To build this trust in the scheme, setting an MRV system is necessary. The more trustworthy the scheme, the more participants will be ready to collaborate and to take active part in it.

An MRV system includes the procedures, guidelines, methodologies, templates and other tools that ensure the results of the scheme are obtained in agreement with the rules. These results (i.e. compliance with RE purchase obligations) are calculated based on information provided by the participants of the scheme and are evaluated (and ultimately approved or rejected) by competent third-party entities appointed by the scheme authority (IISD 2012).

In brief, ‘M’ is often used interchangeably for both ‘monitoring’ and ‘measuring’, but it refers to the act of measuring at least one parameter, which value can be used as obtained during the reporting phase or used as input for further calculations; ‘R’ means ‘reporting’ and is performed either by filling a predefined format that contains all the information that is important for the scheme administrator or by uploading this information to a web-based platform (e.g. registry) designed by the authority; and, ‘V’ stands for ‘verification’ and is the independent evaluation of the information reported, undertaken by an entity different from the one that developed the report. Often this evaluation is undertaken by a third-party accredited under a specific standard (e.g. ISO). The main purpose is to ensure the information provided by the reporting parts is complete, consistent and reliable.

In general terms, the MRV system can comprise:

- **Monitoring:**
  - Guidelines describing the whole process;
  - Methodologies and a variable or variables to be measured;
  - Frequency of measurement;
  - A technically competent person to oversee the monitoring process;
  - Equipment calibration requirements; and
  - Quality assurance and quality control procedures.

- **Reporting:**
  - Frequency of reporting;
  - A minimum time-period for information storage;
  - Pre-defined templates or a proper interface for submitting the required information; and
  - A process and allowed timetable for integrating the results of the verification layer.

- **Verification:**
  - An accreditation criteria and process for third-party organizations;
- A norm or standard against which the verification process will be conducted; and
- Pre-defined templates for reporting recommendations or findings to the reporting parties or conclusions of verification process to the authority.

When designing the MRV system, the authority in charge of its development should be aware of the following challenges:

- Miscommunication between responsible entities to collect and/or manage data;
- Lack of interfaces to share information;
- Insufficient or inexistent systems for the storage or management of data;
- A weak regulatory framework;
- Reduced technical capacity to apply methodologies or to implement quality assurance and quality control procedures; and
- The absence or inadequacy of institutional and human resources to implement the MRV system.

The costs related to the MRV system will vary greatly with its scope and depth. Such costs can include the need for human, institutional and technical capabilities, as well as other recurrent costs like those related to the verification services. Nonetheless, some options to reduce costs can be considered:

- Standardized assumptions (e.g. operating hours or default energy consumption rates);
- Reduced frequency of the data collection process; and
- Random sampling instead of comprehensive measurement (MitigationMomentum project 2013).

An option in designing a robust MRV system is to adopt a tiered approach; that is, the system will keep increasing in complexity with time. A system that is very complex from the outset could discourage the participation of new actors or funding sources. Furthermore, a simple MRV can attract more organizations willing to participate in different ways, e.g. through capacity-building or awareness-raising activities. However, if this approach is selected, an evolutionary plan must be considered from the start. This strategy could enable the authority to keep improving the system continuously, with building blocks designed separately to be later integrated in a more complex mechanism (MitigationMomentum project 2013).

In its simplest form, the data requirements for a REC system include the following:

- Collecting total electricity consumption data from each individual obligated entity, to be able to calculate their RE obligation.
- Collecting generation data from renewable electricity suppliers, to determine the number of RECs that they should receive.
- Collecting data on the number of RECs surrendered by each obligated entity, to compare against their obligation to determine compliance.

In terms of electricity consumption by large consumers that currently have an obligation to purchase RE, all this information is collected by CAMMESA and reported in the Informe de Renovables and its Annex (CAMMESA 2018). CAMMESA also has all the information regarding electricity consumption of large users (MWh), the average power (MW), among other information. The large users with obligation (GUH) also have to inform CAMMESA if they will fulfill their RE obligations outside of the ‘joint purchases’ (e.g. self-generate or buy directly
rather than buying RE through CAMMESA). This information is shown in the Regime for the Term Market for Renewable Energy Sources (MATER) and its annex.

In terms of renewable electricity generation by individual producers, this information is collected by CAMMESA, which also has reports on daily and hourly electricity demand, load curves, marginal costs of generation, total electricity dispatch, among other relevant electricity information. Additionally, CAMMESA has the data on all the existing joint purchases, dates and schedules for the contracted power, prices, power contracted, monthly power generated, transmission needs and problems, as well as requests for dispatches priorities. According to the information on the MATER, there is currently 270 MW of renewable power with dispatch priorities. It is important to note, however, that the available data from different sources does not necessarily match. Data on power from the Ministry or CAMMESA, for example, will not always match data from the associations (e.g. ADEERA and AGUERA).

In terms of data on the actual RE commitments from each obligated entity under the current law (i.e. how and whether they have or have not met their target), the compliance system is not yet clear, nor the consequences of non-compliance, as these obligations only come into force in 2019\(^\text{13}\). There is some data on self-generation (i.e. one of the alternatives of GUH to comply the commitments) but these require more in-depth data collection and analysis.

The following activities are proposed to support MRV, data needs and compliance issues for Argentina’s REC system:

- Develop and implement a customized data collection system, building on existing infrastructure and data, encompassing the following:
  - Energy consumption/demand for different large user groups (i.e. potential obligated entities), building on the framework and databases of the existing Energy Scenarios 2030 work by the MINEM and data collected by CAMMESA.
  - Capacity, generation and actual implementation status of existing RE projects.
  - Implementation schedules for new RE investments, as well as the schedule for new auctions and/or other public and private plan in the framework of Law 27,191.
  - Transmission needs for incremental RE investment (e.g. above that planned for RenovAr) versus actual transmission capacity.
  - Existing plans of obligated entities under the RE law on how they will comply with their current and future obligations.
  - Annual penalties paid by obligated entities for non-compliance.

- Create MRV guidelines and tools for RE generation: Develop relevant templates, guidelines and tools to support MRV for renewable generation, including self-generation at large electricity users, complete with verification requirements and guidelines.

- Create MRV guidelines and tools for compliance with targets: Develop relevant templates, guidelines and tools to support MRV for compliance with targets (i.e. energy demand,"

\(^{13}\)This will be reported in the “Regime for the Term Market for Renewable Energy Sources” (Mercado a Término de las Energías Renovables) https://www.minem.gob.ar/www/833/26379/mercado-a-termino-de-energias-renovables. CAMMESA also publishes a report of that market, see http://portalweb.cammesa.com/Pages/Mater.aspx.
calculated target and compliance with target), including verification requirements and guidelines.

2.2.3 Enabling trading and fostering stability

To foster price stability, countries have adopted different approaches, including: a differentiated production of certificates depending the renewable technology used to generate the electricity, the payment of fee in exchange for not delivering certificates (known as ‘buyout’ payment), technology-specific ‘carve-outs’, and other more broadly adopted options such as banking certificates and postponing obligations.

Some systems include price controls to provide some level of certainty for potential project developers about the cash flows that can be expected throughout the lifecycle of the project. By doing this, project developers are more likely to access the required financing.

Also, other mechanisms to assist in transactions can be considered, such as using intermediaries (e.g. brokers or aggregators14), who bring together buyers and sellers to assist in transactions, or external exchange platforms that facilitate market transparency.

While Argentina does not currently have any certificate systems, the operation of the electricity market may have some lessons and relevance for new trading systems. Argentina’s electricity pricing system has been moving from a highly interventionist approach to a more market-based approach to price-setting, with the new wholesale market price. During 2016, only 3% of total electricity was traded by long-term contracts; the rest was bought on the daily spot market (CAMMESA 2017a). Relying on long-term contracts adds important stability and certainty to prices. The wholesale market administrator, CAMMESA, will be a critical stakeholder in any future markets or exchanges for electricity-related attributes or certificates. This will require capacity building, however, to deal with new market models (see sections below discussing institutional and regulatory frameworks).

The following activities are proposed to address trading stability issues for Argentina’s REC system:

- Analyze possible flexibility mechanisms – e.g. a carry-over option, banking options, certificate validity, compliance options (penalty, certificates, or both), technology-specific carve-outs, and/or multipliers (e.g. a banded system).
- Estimate the impact of possible price collars (e.g. a minimum price for certificates and a penalty for not achieving RE goals).
- Design a mechanism for recycling funds collected from payment of penalties and consider how this revenue could be used.

2.2.4 Institutional and regulatory framework

The main participants in a REC scheme are described below. Note that a key issue is the separation of the policy development/regulatory development from the administration of the scheme, since these require different capacities and skills. In addition, to prevent conflict of

14 An aggregator can be either an entity owning many renewable energy production facilities or an entity with agreements with multiple owners with the objective of managing generating sources on their behalf.
interest, the generators should not be part of the regulatory functions and the verification of compliance.

- Environmental policy ministry/agency: Public entity in charge of setting-up the GHG emission reduction obligations, including those for the electric industry.
- Energy policy regulator: Public entity designated to implement energy policy through regulatory development and enforcement.
- Administrator: Entity authorizing the issuance of certificates, creating and managing (and possibly also operating) the registry, verifying the fulfilment of requirement of certificates, submitting requests for information, MRV for ownership of certificates, and overseeing the integrity of the certificates.
- Electricity market operator: Agency operating the electricity market and reporting to the scheme administrator the energy produced by each generator.
- Eligible renewable generators: Electricity generators using technologies deemed eligible by the scheme administrator, which are issued RECs based on their generation performance.
- Registry operator: A state-owned entity or a third party appointed to manage the compliance platform for obligated entities.
- Obligated entities: Consumers with obligations to purchase RECs as determined by the scheme administrator.
- Voluntary entities: Entities that do not have obligations to purchase RE but are interested in using certificates voluntarily as proof their purchase of renewable electricity.

The overview of exchange flows of information, certificates and financial resources is described in Figure 25.

**Figure 25: REC scheme institutional framework**

Source: Own elaboration

Argentina has some existing institutions that could play a role in a REC scheme but may also need to develop some new institutional structures.

- Environmental policy ministry/agency: MAdyS is responsible for climate change policy and coordination of all related policies for GHG mitigation.
• Policy regulator: National Energy Regulatory Entity (ENRE) is the main public entity designated to implement energy policy through regulatory development and enforcement, although provinces have additional authorities that oversee distributors in their areas.
• Administrator: This could be a unit inside one of the relevant ministries, or at CAMMESA, or within ENRE, or possibly a new dedicated entity set up to administer the scheme.
• Electricity market operator: CAMMESA is the market operator in Argentina.
• Eligible renewable generators: These would include a variety of private companies, as in the current RenovAr program.
• Registry operator: This could be units within the electricity market operator, administrators, or another dedicated entity, among other options.
• Obligated entities: This would be decided as part of the scope and coverage of the scheme (see section 2.2.1).
• Voluntary entities: These could be a variety of private companies in Argentina which may be interested in using certificates voluntarily, proving their purchase of renewable electricity.

To address institutional and regulatory issues for Argentina’s REC system, a plan should be developed for institutional, regulatory and capacity development, which would include:

• A plan for institutional arrangements for rule-making, administration, and market oversight;
• Analysis of options and decisions on roles and responsibilities under the RECs scheme;
• Capacity assessment and capacity building plan for the relevant institutions and actors;
• Evaluation of additional costs of institutional arrangements; and
• A plan for developing necessary regulation, including rules related to ownership and taxation.

2.2.5 Technical infrastructure, including registry

Registries are created with many objectives, including keeping track of each unit of energy produced from RE sources, the corresponding number of RECs issued, and the transfer of these RECs from generators to obligated entities. Certificates serve as a fingerprint for each MWh from RE sources, which means that no two have the same identification information and that one certificate can be placed in only one account at the time. The basic information contained in a REC includes the generation source, technology, and vintage.

Depending on the number of generators supplying electricity to the grid and the composition of the electricity grid in terms of how many operators are involved, there can be one or more registries per country. Given that the purpose of the registry is to keep track of REC generation and transactions, it may not require undertaking a third-party auditing process or chain of custody assessment. Also, it is possible to design a registry with a robust functionality to enable a coexistence of the compliance and voluntary markets, reducing possible costs of auditing, lowering the complexity in the communication between both markets and decreasing the possibility of a double counting of environmental attributes. Registries are not typically designed for continuous trading; however, they usually publish reports or bulletins containing purchase proposals or buyers interest, enabling bilateral transactions to take place between interested parties. Once agreements are reached, the seller can transfer the RECs sold to the account of the purchasing party.

In terms of the actual information technology software and hardware needed for the registry, Argentina could consider four major options:

• **Sharing**, by using a single common registry across jurisdictions/countries.
- **Custom developing**, by drafting the functional and technical specifications for an IT services provider to develop a registry system from scratch.
- **Adapting**, by contracting an IT services provider to adapt and implement an existing, open source or licensed registry.
- **Outsourcing**, by using the software as the basis for a service model—the software vendor hosts and maintains the servers, databases, and code that constitute the registry application.

Any approach that involves the services of an IT company has pros and cons, and the final decision should consider factors such as the cost of maintenance, complexity, flexibility of the system, and data ownership. A registry is unlikely to operate in isolation and is likely to interface with several IT systems and databases. Other systems and databases include the national GHG inventory, and other registries where there is linking between jurisdictions. Any new registry should be compatible with existing systems in the sector, provide transparency for the program, and follow public procurement guidelines and rules.

The complexity of a registry can vary greatly, which is naturally associated to the level of costs. As can be seen in Figure 26, the levels of complexity can be visualized as concentric circles, from the less complex one in the inner circle to the most complex at the outside. The figure illustrates two groups registry-related criteria: 1) operational management issues in blue (e.g. volume transactions, interlinking with other registries, and communication with other IT platforms); and, 2) risks criteria in orange (e.g. type of transactions, risk of theft and need for market oversight and regulation).

*Figure 26: Deciding on level of complexity for the registry*

Source: (PMR 2016)
Argentina already has a new registry for Renewable Energy Projects, which was promulgated as the National Registry for Renewable Energy Projects,\(^{15}\) so building on this system could be explored as part of the design of the REC system. There are also associations that could potentially house part of a registry or contribute to the registry, for example, for large users of electricity (AGUEERA), distributors (ADEERA), and generators (AGEERA).\(^{16}\)

To address technical infrastructure issues for Argentina’s REC system, it is proposed that a possible registry system should be designed, including functional specifications, options for procurement, interface needed with other systems, and financing options, based on:

- Analyzing current and future needs with regards to the use of the registry (e.g. also gathering information for reporting NDCs progress and interlinking with other instruments);
- Screening different registry system configurations, including functional specifications, interface needed with other IT systems and databases, and other technical infrastructure needed;
- Evaluating options for development (i.e. sharing, developing, adapting or outsourcing);
- Estimating costs of operation and financing options for registry; and
- Assessing alternatives for auctions or bidding processes (e.g. enabling external systems like power exchanges).

\(^{15}\) Article 9, National Resolution MEyM N° 281/2016

## 2.3 Activities, deliverables and proposed budget

### Table 10: Outputs, activities and deliverables for Renewable Energy Certificates

<table>
<thead>
<tr>
<th><strong>Output</strong></th>
<th><strong>Rationale</strong></th>
<th><strong>Activities/description</strong></th>
<th><strong>Deliverables</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2.1 Modelling and analysis to support decision on RECs as a CPI</strong></td>
<td>Government and stakeholder groups need to understand the options and potential impacts of the REC scheme, how it may interact with other policies, and how it may affect energy prices in the context of ongoing tariff increases and the expansion of the RenovaAr program, to decide on how to move forward.</td>
<td>- Screen modelling tools, identify data needs, map barriers to RE and create high-level scenarios for RECs (e.g. scope, expansion of RE targets, type of obligation, compliance options, etc.).&lt;br&gt;- Model potential demand and market size under different REC scenarios, as well as potential impacts on energy prices, energy consumption, transmission and distribution requirements, socio-economic (micro and macro) impacts and emissions.&lt;br&gt;- Assess interaction of RECs with other policy instrument including carbon tax.&lt;br&gt;- Facilitate engagement and workshop with government and key stakeholders to discuss recommendations on RECs.</td>
<td>REC scheme pre-feasibility study for Argentina.</td>
</tr>
<tr>
<td><strong>2.2 Definition of scope and target for REC scheme</strong></td>
<td>Clarity is needed on scope and target to inform other decisions on detailed design.</td>
<td>- Analyze renewable electricity supply curve (i.e. generation potential and costs by technology) to estimate costs of different REC scheme targets.&lt;br&gt;- Analyze the rationale for scope, coverage and target for the scheme based on key quantitative and qualitative considerations (e.g. micro- and macroeconomic costs, grid impacts, voluntary market links, interaction with other RE policies).&lt;br&gt;- Facilitate stakeholder engagement and government decision on REC scheme scope, coverage and target.</td>
<td>Formal decision on scope and target for REC scheme.</td>
</tr>
<tr>
<td><strong>2.3 Design of overall REC scheme</strong></td>
<td>Enabling environment and infrastructure for REC scheme should match the goals and scope of the scheme and draw upon international best practice, considering Argentina’s priorities and capacities.</td>
<td>- Develop and implement data collection system for larger user energy consumption (i.e. potential obligated entities) and RE production (current and planned).&lt;br&gt;- Develop relevant templates, guidelines and tools to support MRV for RE generation and for compliance with targets, including verification requirements and guidelines.&lt;br&gt;- Analyze options for compliance flexibility, price controls and the potential for revenue recycling (i.e. form penalties).&lt;br&gt;- Develop a plan for institutional, regulatory and capacity development.&lt;br&gt;- Design registry system, including functional specifications, options for procurement, interface needed with other systems, and financing options.</td>
<td>Renewable Energy Certificate Design Study for Argentina.</td>
</tr>
</tbody>
</table>
2.4 Design a pilot phase for REC scheme

Piloting will be designed to test the enabling environment and infrastructure before a full launch.

- Define detailed scope of work for institutional structures, including any new entities needed, and start implementation of capacity building plan.
- Support preparation of regulatory framework
- Prepare a plan for rolling out the technical infrastructure.
- Propose the goals and a plan to put in place MRV systems for a defined group of actors for 1-2-year pilot (possibly without compliance penalties)

Proposed institutional and regulatory framework
Capacity building workshops
Proposed technical infrastructure/registry, and MRV system

Table 11: Timeline for Renewable Energy Certificates

<table>
<thead>
<tr>
<th>Output</th>
<th>Rationale</th>
<th>Activities/description</th>
<th>Deliverables</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.4</td>
<td>Design a pilot phase for REC scheme</td>
<td>Piloting will be designed to test the enabling environment and infrastructure before a full launch.</td>
<td>Proposed institutional and regulatory framework Capacity building workshops Proposed technical infrastructure/registry, and MRV system</td>
</tr>
</tbody>
</table>

Table 12: Budget for Renewable Energy Certificates

<table>
<thead>
<tr>
<th>Output</th>
<th>Estimated support from PMR (USD)</th>
<th>Funding source (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>2019 (12 mo)</td>
<td>2020 (6 mo)</td>
</tr>
<tr>
<td>2.1 Modelling and analysis to support decision on RECs as a CPI</td>
<td>70,000</td>
<td>70,000</td>
</tr>
<tr>
<td>2.2 Definition of scope and target for REC scheme</td>
<td>0</td>
<td>230,000</td>
</tr>
<tr>
<td>2.3 Design of overall REC scheme</td>
<td>0</td>
<td>247,500</td>
</tr>
<tr>
<td>2.4 Design a pilot phase for REC scheme</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>70,000</td>
<td>547,500</td>
</tr>
</tbody>
</table>
3 Energy Efficiency Certificates

3.1 Preparatory work to support and inform policy decisions on carbon pricing (Building Block 2)

This chapter presents the policy context and mitigation potential for energy efficiency in Argentina and a roadmap for designing and piloting an EEC scheme as a CPI. This would start with a pre-feasibility analysis that would support Government’s decision on whether/how to move to the design phases of a EEC scheme. Following this, key activities would include setting targets for the scheme, developing tools for MRV, promoting market stability, developing the appropriate institutional and regulatory frameworks, setting up the necessary technical infrastructure, and designing a pilot for the new CPI.

3.1.1 Overview of policy context and mitigation potential

As with renewable energy, the reduction of carbon emissions through EE policies and measures shows great potential in Argentina. Figure 27 illustrates the potential to save 10.2% of final energy demand through the implementation of EE policies and measures by 2030\(^{17}\).

Figure 27. Estimates of final energy demand savings due to EE policies by 2030

Note: “Tendential” is the business as usual scenario in the Energy Scenarios analysis.
Source: Under-secretary of Energy Saving and Efficiency

Energy efficiency policies incentivize and develop mechanisms for energy saving and rational use of energy in all the sources that make up the Argentine energy matrix in the different demand sectors. These measures reduce final demand as a direct result, and in turn mitigate GHG emissions through the reduction in fossil fuel-based energy consumption. In addition to this direct effect, there are development co-benefits of EE: for example, increases in productivity, employment generation, and increased tax revenue (e.g. by higher investments and reduction of subsidies). For Argentina, as for many developing countries, these co-benefits

\(^{17}\) For more information, see Energy Scenarios 2030 (http://scripts.minem.gob.ar/octopus/archivos.php?file=7800).
are of great interest. Therefore, EE policies are within the most relevant policies to be implemented in the energy sector and are explicitly included as top Governmental priorities. At the start of the current administration, the Argentinean Government stated 8 main Governmental objectives and 100 priorities**, directly linked to the Sustainable Development Goals (SDG) of United Nations. EE is explicitly mentioned within these priorities as a component of the 6th Objective of the Government “Sustainable Human Development” and linked to SDG 7, 11 and 12. The 67th priority states: “With the aim of promoting savings and energy efficiency, we are implementing dissemination and communication programs aimed at the residential, industrial and commercial sectors. Initiatives are also incorporated to promote the energy savings in transportation and in the public sector”.

Even though Argentina has some regulatory precedents for EE since 2007**, it was after the creation of the Under-secretariat of Energy Saving and Efficiency in 2015 that these efforts have increased significantly**(6). As mentioned in chapter 1, as part of modernization of the public sector and prioritizing EE, in 2015 the Decree 231/15 created the Under-secretary of Energy Saving and Efficiency, which initially was under the Secretariat of Strategic Energy Planning. More recently, as part of a 2018 restructuring of the MINEM, the Under-secretary was moved to report directly to the Minister of Energy and Mining, elevating its importance. Resolution 143/16 determined that the Under-secretariat would be composed of two national directorates: one for policy development (including coordination of national and international programs) and the other for implementing EE programs. Currently, there are five main fields of work in this Under-secretariat: Directorate of Education for Energy Efficiency; Directorate of Energy Efficiency in Productive Sectors and Transport; Directorate of Energy Efficiency in Buildings and Public Sector; Coordination of Transport; and Coordination of Planning, Measuring and Verification. Each of these directorates and coordination offices have their own objectives, programs and plans**(19).

Argentina is currently discussing its first Energy Efficiency Bill, which is intended to improve the institutional framework for all future EE policies. The draft of the law may propose a governmental commitment to implement a ten-year National Energy Efficiency Plan, to be reviewed every five years, including: targets, regulations, mechanisms to promote supply- and demand-side EE, and education programs on the efficient use of energy. The programs may also include EE labelling (e.g. energy consuming equipment and components, including vehicles and buildings), EE standards (e.g. equipment and components), and a Trust Fund for the Development of Energy Efficiency (FODEE) to finance projects and activities in EE (including cogeneration). FODEE may receive funds from loans or donations from international organizations, National Treasury, and/or other resources to be defined. Additionally, the Bill may also include commitments for natural gas and electricity distributors to implement EE programs in their installations and for final users; and a specific regime for EE investments that may include differential tariffs, fiscal incentives, and priorities for local components. These targets will be built on the existing projections made by the Under-secretary in terms of EE potential. All these issues will be relevant to the design of an EEC scheme. Box 1 contains more information on the draft Energy Efficiency Bill objectives and milestones.

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18 See: [http://www.odssargentina.gob.ar/VinculacionODS](http://www.odssargentina.gob.ar/VinculacionODS)
20 For instance, recently the Under-secretary financed more than 200 energy audits were more than 800 improvement opportunities have been identified
21 For more information on the different Directorate, see: [https://www.argentina.gob.ar/areas-de-trabajo](https://www.argentina.gob.ar/areas-de-trabajo)
As previously stated, according to information from National Energy Balance, transport, households and industry are the most relevant sectors for energy demand, representing 30%, 27% and 23% of total final energy consumption, respectively; while the three key final energy sources are natural gas (36%), electricity (20%) and diesel oil/gas oil (20%).

The estimated savings that could be achieved by EE measures has been estimated at more than 8 million tons of oil equivalent (toe), with the residential sector being the most promising (48% of the total), followed by transport (22%) and industry (19%) (Figure 28). The list of important EE measures identified for each of these subsectors includes the following:

- residential: more efficient appliances; lighting and buildings envelop;
- transport: measures related to the railway system; freight road transport; and urban sustainable transport
- industry: energy optimization, cogeneration and more efficient motors;
- as well as cross-cutting EE policies
In terms of final energy sources, electricity (16.8% of projected 2030 savings) and natural gas (12.3% of savings) are the most important for energy savings. However, while natural gas is the most relevant source for industry, accounting for 56% of total energy consumption, the opposite is seen in the commercial and services sector, where electricity represents 66% of total energy consumption and natural gas only 25%. In the case of the household sector, natural gas represents 64% and electricity 25% of final demand.

**Figure 28: Energy savings by sector and fuel according to energy efficiency scenario, 2030**

This EE potential is considered in the sectorial action plans developed by MAyDS. A list of EE actions in the household sector is part of the National Energy and Climate Change Action Plan, for example, and a long list of measures for industry will be evaluated in the National Industry and Climate Change Action Plan in 2018. EE measures account for half of total mitigation actions of the energy sector included in the Argentinean NDC, with households and industry accounting for 20% and 8%, respectively (see Figure 29). This could translate into a reduction of 6.2 MtCO2 for industrial EE measures and 15.4 MtCO2 for households EE measures. Most of these measures and plans were carefully evaluated in Argentina’s Third National Communication to the UNFCCC. As mentioned earlier, the sectorial action plans, which are developed in conjunction with the Under-secretary of Energy Saving and Efficiency in the case of the National Energy and Climate Change Action Plan, include roadmaps for each measure – even if they do not refer to CPIs. In the case of household EE policies, the National Energy and Climate Change Action Plan includes barrier analysis and measures proposed or under evaluation for the EE actions in residential sector. As mentioned in Chapter 1, the majority of the existing or planned measures are more traditional “command and control” policies rather than CPIs. At the same time, the need for incentives through CPIs is clear for many interventions. For example, additional investment costs are an important barrier to increase penetration of energy efficient appliances, which could partly be addressed by CPI-related incentives. This could increase the effectiveness of the current set of conventional measures such as awareness campaigns, labelling, and standards.
This explains the strong interest in evaluating CPIs to support EE actions in the sectorial plans developed by MAyDS and MINEM, as part of overall policy development and implementation. The significant potential for EE in the household and industry sectors suggests that these could be priorities for the analysis of CPIs. However, considering the relevance of the transport sector for energy consumption, this area should also be considered in the pre-feasibility phases of CPI development. As mentioned earlier, there is a special MINEM Directorate within the Under-secretary for transport policies that is developing initiatives such as transport EE standards and labeling programs, tests for the verification of energy efficient technologies, and various capacity building activities. Chapter 5 explores in more detail the CPI options for the transport sector, including how to support the specific actions in the National Transport & Climate Change Action Plan.

Two of the key issues that should be considered for development EE policy instruments are progress in information gathering and analysis, and the changes in regulatory environment. In terms of data, significant progress in gathering information has been made in recent years. Information on the main barriers to EE in the residential sector has been gathered during the development of the National Energy and Climate Change Action Plan; and the same will be done as part of the National Industry and Climate Change Action Plan. In the case of industry, this analysis has also been done in recent projects for industrial energy audits and in the framework of the Resolution for Electrointensive users (see Table 12); will be deepened in the context of the Energy Efficiency in Argentina (EEA) project beginning in April 2018 (see below); and will be addressed in the Second Phase of the Electro-intensive resolution. What is still needed, however, is a deeper analysis on barriers for specific instruments and whether these instruments – particularly CPIs - could remove remaining barriers to EE investments.

In terms of the regulatory environment, as part of the deregulation and privatization of the energy sector, most of the electricity and natural gas utilities were privatized. The regulatory framework for the electricity sector is mainly determined by Law 24.065 and its amendments, and for natural gas, the Law 24076/92. The federal nature of Argentina, according to the Constitution, means that the Argentinean energy sector is characterized by coexisting national
and provincial competences. In fact, in the case of energy distributors, there is no a unique national regulatory framework or institution, but these are regulated at the provincial level.

ENRE is an autonomous body responsible for regulating electricity activity and for controlling specific companies in the sector: generators, transporters, and only two distributors (Edenor and Edesur – the electricity distributors for the City of Buenos Aires and Greater Buenos Aires). At provincial level there are different private and public distributors and cooperatives, regulated by provincial entities under specific provincial regulations. Some of these entities also regulate other provincial services. A few provinces are without regulatory bodies, and the electricity distribution activity is regulated by the provincial energy directorate – as, for example, the province of Santa Fe.  

Unlike electricity, the natural gas market is regulated and controlled by the National Gas Regulatory Entity (ENARGAS), which is an autonomous authority created by Law No. 24,076 in 1992. ENARGAS is supervised by the MINEM, and regulates gas distribution, which is considered a public service by the regulations. It also regulates the activities of the sub-distributors and controls the Registration of Qualifying License Plates for the sale of equipment and compressed natural gas for the transport sector. It also controls the gas certification systems, as well as the labeling of EE in kitchen appliances, water heaters, and hot water tanks.

**Previous experience with EE programs and plans**

Various programs for EE have been implemented since 2000 by the former Secretary of Energy. After the creation of the Under-secretary of Energy Saving and Efficiency, there has been a re-evaluation of the existing plans to develop new programs based on experience. Although most of the plans implemented are at national level, it is important to note that, as part of the Constitutional reform of 1994, provinces can develop their own regulation in the energy sector.

One of the first attempts to introduce the EE in regulation at national level was made in 2007, in the context of an important energy crisis, though Decree 140/2007: The National Program for Rational and Efficient Use of Energy. The objective of this program was to improve EE in short- and long-term in industry, transport, residential sector, service sector and public buildings. It consisted of different subprograms, including: energy audits for industrial and commercial small and medium enterprises; implementation of Energy Management Systems (EMS) for large industrial and commercial firms; public lighting; and energy labelling. In 2009 the Argentinian Trust for Energy Efficiency (FAEE): financed by the World Bank, was launched, with the aim of increasing EE in industry and SME sector mainly through financial incentives and loans.

Regarding EE standards and labeling, in 1999 Resolution 319/99 of the former Secretary of Industry, Commerce and Mining, established the framework for the mandatory application of EE labels for electrical appliances. In 2007, as indicated above, Decree No. 140/2007 addressed the EE labeling regime and the implementation of minimum EE standards. Currently labeling for electrical and gas appliances is mandatory for: refrigerators, freezers, incandescent lamps, fluorescent lamps for general lighting with single and double ferrules, halogen lamps, air conditioners, electric washing machines, ballasts for fluorescent lamps, ovens and burners, water heaters, electric and gas storage water heaters for domestic use, single-phase induction

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23 In addition, there are different actions implemented by the provinces. For instance, the Integrated Energy Efficiency 20-Year Plan for Santa Fe, and the Provincial Program for Efficient Energy in the province of Cordoba.
electric motors, three-phase induction electric motors, electronics with standby mode, television receivers, gas ovens and gas burners. There is also a voluntary EE labeling standard for: electric pumps for home use; television receivers in on mode, and microwave ovens for domestic use.

In 2016, the Development Bank of Latin America conducted a study to identify priority sub-sectors and strategic EE measures for Argentina. The study focused on private initiatives for commercial and industrial sectors. Priority was given to twelve strategic measures:

- Replacing halogen bulbs by LED lamps.
- Substitution of incandescent bulbs by low-consumption CFL bulbs.
- Replacement of ventilators in refrigeration chambers or use of more efficient motors in commercial cooling systems.
- Establishment of the ISO 50001 norm for energy management systems in industries, related to energy-intensive processes and the heating of units and buildings.
- Installation of devices to control rotating speed of industrial motors.
- Insulation of industrial pipes to reduce heat loss.
- Substitution of uninterruptible power supply systems by new-generation equipment.
- Replacement of gasoil boilers by air or water pumps for climate control (heating or cooling).
- Installation of efficient compressors to cool milk in dairy farms.
- Changing current air-conditioning equipment to high-efficiency versions.
- Installing efficient ovens for steel casting in tool-making industries.
- Upgrading industrial boilers.

In 2017, a resolution with important implications for the promotion of EE entered into force: the Regime for Electro-intensive and Ultra-Intensive Energy Users, a joint resolution between the MINEM and the Ministry of Production (1-E/2017). This establishes a preferential tariff for electricity-intensive users when they apply EE measures, which should drive cost reductions and increases in energy productivity. The main purpose of the resolution was to promote EE investments in the ten strategic sectors most relevant for socioeconomic development. The resolution states that large users (referred to as GUMA, GUME, and GUDI) that undertake certain EE actions may be eligible for a reduction in electricity tariffs. Under this program, 519 electricity-intensive firms with demand greater than 300 kW have already developed a characterization of their consumption patterns, EE potential, identification of measures and started implementation. In the initial stages of this resolution more than 64,000 motors were identified with a total nominal power of 1,508 MW; 175,137 lamps were identified, of which 162,000 could be replaced. These replacements translate into more than 40 GWh of savings. Almost 2,000 improvement opportunities were identified, 31% in lighting and 19% in motors. The results of the resolution also provided rich data on energy consumption in industry, which is crucial for the development of the EE policy and evaluating CPIs. Currently a second part of the Resolution 1-E/2017 is under evaluation and will be launched soon.

Beyond the industry and household sectors, transport is currently of special interest for the Undersecretary of Energy Savings and Efficiency and many actions have been developed and evaluated, such as labelling and capacity building activities, among others. Table 13 shows a summary of other programs that have been implemented recently in different sectors as well as some that will be implemented in the near future. All this information is present in detail in the 2017 Annual Report of the Under-secretary of Energy Saving and Efficiency.

### Table 13: Recent and projected EE programs in different sub-sectors

<table>
<thead>
<tr>
<th>Sector</th>
<th>Up to 2017</th>
<th>Projected (2018)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Industry/Productive Sector</strong></td>
<td>Financing for EE in SMEs ($4.3 million)</td>
<td>6 Learning networks in EMS Audits and sectorial capacities</td>
</tr>
<tr>
<td></td>
<td>Electrointensive resolution: economic incentives over the electricity tariff for 665 firms</td>
<td>Registry of consultants Second phase of Electrointensive resolution</td>
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<tr>
<td></td>
<td>Creation of Learning Networks for Energy Management Systems (EMS)</td>
<td></td>
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<tr>
<td></td>
<td>Finalization of “Energy Audits for SMEs” (219 audits with identification of the most relevant measures)</td>
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<tr>
<td></td>
<td>Argentinean Trust for Energy Efficiency (FAEE): Financing for 37 SMEs for EE measures ($2.9 billion)</td>
<td></td>
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<tr>
<td></td>
<td>Launch “Argentina Efficiency Prize” – For firms with EMS certification ISO 50,001</td>
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</tr>
<tr>
<td><strong>Households</strong></td>
<td>Residential energy labeling. IRAM 11.900.</td>
<td>New pilots to be implemented in other cities of the country</td>
</tr>
<tr>
<td></td>
<td>Pilot phase in Rosario - 500 houses</td>
<td>Calculator for residential energy consumption</td>
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<tr>
<td></td>
<td>Workbook for responsible use of energy in multi-family houses and other buildings</td>
<td></td>
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<tr>
<td></td>
<td>Development of a strategic tool for the Provincial Institutes of Housing: the Semaphore for Social Houses</td>
<td></td>
</tr>
<tr>
<td><strong>Public</strong></td>
<td>EE in sustainable public procurement</td>
<td>Development of contracting by ESCO models</td>
</tr>
<tr>
<td></td>
<td>Energy audits in public buildings and identification of EE opportunities (15 buildings)</td>
<td>Energy audit tools for public buildings</td>
</tr>
<tr>
<td></td>
<td>Pilot of performance contracts -ESCOs (6)</td>
<td></td>
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<tr>
<td></td>
<td>Efficient Lighting Program (PLAE) (94,104 luminaries replaced; 60 GWh/year saved; 17 provinces)</td>
<td></td>
</tr>
<tr>
<td><strong>Equipment</strong></td>
<td>Improved appliances labelling: 7 standards for mandatory labelling</td>
<td>Minimum standards More appliances with labelling.</td>
</tr>
<tr>
<td><strong>Transport</strong></td>
<td>Energy labeling for light duty vehicles (IRAM/AITA 10274-1)</td>
<td>Energy labeling for light duty vehicles Green Freight Pilot Program</td>
</tr>
<tr>
<td></td>
<td>Workbook for efficient management of freight transport</td>
<td>Efficient Technology verification program</td>
</tr>
<tr>
<td></td>
<td>Eco driving module in national driving licenses</td>
<td>Sectorial pilots</td>
</tr>
<tr>
<td></td>
<td>Efficient management of freight transport capacity building</td>
<td>Eco driving module in national and local driving licenses</td>
</tr>
<tr>
<td></td>
<td>Efficient technology verification tests</td>
<td>Workbook for eco driving in light duty vehicles</td>
</tr>
<tr>
<td><strong>Education/Capacity building</strong></td>
<td>Guidebook for improving EE education in Engineering and Architecture</td>
<td>Strategic alliances with specific institutions.</td>
</tr>
<tr>
<td></td>
<td>Training of teachers and professors (+5,000)</td>
<td>EDUCCAR platform</td>
</tr>
<tr>
<td></td>
<td>Diploma for EMS in Buenos Aires and Jujuy</td>
<td>Training energy managers with new EE diploma (&gt;&amp;100)</td>
</tr>
<tr>
<td></td>
<td>Guidebooks for efficient use of energy in different sectors (industry, freight transport, households, buildings)</td>
<td></td>
</tr>
<tr>
<td><strong>Communication</strong></td>
<td>Mass campaigns with high impact</td>
<td>EE website</td>
</tr>
</tbody>
</table>
Market Readiness Proposal - Draft | Argentina

(+34MM people) – Particularly important in summer
37 public events in 9 provinces
Participation in “Tecnopolis” and dissemination of “Guidebook for Good Practices in Energy Use”
Organization of Second National Workshop on Energy Efficiency (>500 participants)

| Information and monitoring | Efficient Scenarios 2030 study
| Contribution to National Energy and Climate Change Action Plan
| Inclusion of energy in the “National survey of household expenditures” (45,000 households)
| Agreement with INDEC

| International Networks | Join International Partnership for Energy Efficiency Cooperation (IPEEC) (March 2017)

| Diffusion of EE labeling | National Useful Energy Balance National Plan for EE MRV protocols

Source: Under-secretary of Energy Saving and Efficiency

In 2017, MINEM started to design and gather information for the elaboration of a National Useful Energy Balance, which is crucial in terms of reducing information gaps and will be highly relevant for the elaboration of future strategies for EE. This balance will be developed in two stages and with a different structure and institutional organization.

In the case of the National Useful Energy Balance for household sector, the study will be developed in conjunction with the National Statistics and Census Institute (INDEC). For the first time, the National Survey of Household Expenditures developed by INDEC includes a module for energy. The survey includes 45,000 homes in the country, for a year, and a good national representativeness is expected. The results will be then refined over time. The first results of this research will be obtained in April 2018 and will constitute the base for the Household National Useful Energy Balance. This implementation of the National Useful Energy Balance and data gathering is also very relevant from the institutional point of view as it laid the foundations for the signing of an agreement between the MINEM and INDEC for this and future studies. It will also provide continuity to the analysis as there will be a systematic information gathering every 5 years for household sector.

Part of the National Useful Energy Balance for industry and transport will be developed in the framework of the “Energy Efficiency in Argentina” (EEA) project financed by the European Union. The EEA Project will assist the MINEM with the analysis of the structure of energy consumption and the preparation of consumption projections, taking into account for each end-use sector.

The EEA project will be implemented in the framework of some reform policies of the Argentinean Government since the installation of the new administration in late 2015. A first project on identifying options for EE in Argentina was agreed in early 2015 and funded by the Partnership Instrument. During President Macri’s visit to Brussels in July 2016, the EU and Argentina agreed to further deepen their cooperation in this field. At the beginning of 2018, the European Commission approved this new project, “Energy Efficiency in Argentina”, for more than 4 million euro over 3 years of work, which aims to further support the reform of the energy sector, and Argentina’s efforts to introduce rational energy use in key sectors of the economy. The overall project beneficiary and coordinating partner from Argentina is the MINEM, with the Under-secretary for Energy Saving and Efficiency as the direct partner of the
Project. The main objective of the project is to support to shape a more sustainable, environment-friendly and efficient energy sector. This includes:

- Showcase state-of-the-art technological EE solutions and best practices;
- Development of a National Energy Efficiency Plan and the required policy and regulatory framework (including supporting the National Useful Energy Balance);
- Technical Assistance for standards and labelling, energy management in industry and public sector, and participation in international EE activities.

The main activities include the following:

- Elaboration of End-Use Energy and Useful Energy Balance for Argentina for 2018 based on the National Energy Balance elaborated by MINEM;
- Estimation of the present level of energy consumption and energy intensity;
- Estimation of energy saving potential for each sub-sector;
- Assumptions related to a change in the energy intensity level, including the effect from targeted EE policies;
- Projections and scenarios for future energy demand;
- Assist MINEM with the selection and installation of the required software for the data processing, analysis and reporting.

Projections for future energy demand will be prepared using the Long-Range Energy Alternatives Planning (LEAP), which is the standard methodology used by MINEM, from Stockholm Environment Institute and will be cross checked against projections derived from other data sources and methodologies (e.g., macroeconomic indicators, timeline and trends in energy density parameters, etc.), and against results from similar countries. The data in all sectors will be further processed and analyzed. Energy indicators and other relevant data for the preparation of the Plan for Energy Efficiency in Argentina will be calculated.

The table below presents a summary of the present and projected international cooperation agreements for the Under-secretary of Energy Savings and Efficiency.
<table>
<thead>
<tr>
<th>Funding Source</th>
<th>Implementation</th>
<th>Project Name</th>
<th>Description</th>
</tr>
</thead>
</table>
| EU             | EU             | Energy Efficiency in Argentina (EEA) | This program aims to support Argentina in its effort to shape a more sustainable, environment-friendly and efficient energy sector:  
- showcase state-of-the-art technological solutions and best practices.  
- present international - in particular European - policy and regulatory frameworks to appropriate bodies in the Argentinian administration and other relevant actors.  
- provide appropriate focused technical advice to the competent national authorities for a limited period of time.  
- provide technical assistance for the relevant institutions and agencies on how to draft a national plan on EE. |
| BID            | MINEM          | Technical Cooperation for Energy Efficiency Studies | This project has two main components:  
- Component 1: Development of a funding strategy for EE projects in different sectors based on international experience.  
- Component 2: Evaluation of cogeneration potential, identification of regulatory barriers and replicable best practices in other countries. List of cogeneration projects at a good pre-feasibility level. |
| GEF            | BID            | Energy Efficiency and Renewable Energy for Social Housing in Argentina | Design and construction of 128 prototypes for social housing with EE and RE interventions; monitoring results over one year and comparing these to a control group of 640 social housing buildings. Based on a cost-benefit analysis of the results, minimum living standards for low-income housing with EE and ER for the different bio-environmental zones of Argentina will be developed. |
| GCF            | BID - BICE     | Promotion of instruments for risk mitigation and financing in renewable energy and energy efficiency | The aim is to mobilize financing from the GCF to promote efficiency in the production and use of energy in Argentina, to contribute to the reduction of GHG emissions, as well as the development of a more favorable financial environment for sustainable energy. |
| GEF            | FB - BID       | Mechanisms and networks for the transfer of Climate Change technologies in Latin America and the Caribbean | The aim of this study will be to select 3 emblematic buildings and conduct energy audits to identify savings and efficiency opportunities (with national or international funding) |
| BMZ | GIZ | *Strengthening the enabling conditions for the promotion of energy efficiency through the exchange of good practices between Mexico and Argentina* | Cooperation amount Argentina, México and Germany for the development of energy efficiency learning networks based on Germany model. |
3.1.1.1 Interaction of carbon pricing with other policies

As has been described and discussed above, it is crucial to evaluate the interaction of the implementation of CPIs with existing plans to avoid overlapping incentives and instruments. In the case of EE, while the Energy Efficiency Bill is under discussion, the MINEM has internal EE goals and objectives which will be the base of the Argentinean goals and EE plan and of the EECs. The analysis and implementation of the MRP should support existing plans and the inputs, information and capacity generated as part of the activities will contribute to the EE plan. This analysis should be updated regularly during MRP implementation as the EE plan is developed. Another issue that should be considered as part of the feasibility of new CPIs is the possibility of overlap between RECs and EECs, if the chosen scope and target of the schemes is such that they cover some of the same obligated entities. If the alternative chosen for RECs is to use this instrument to incentivize large users and the EEC scheme is also applied to energy consumption by large industrial consumers, then the schemes should be designed in a way to incentivize both increase EE and purchasing a larger share of renewable energy.

Finally, although up to now there may not be significant interaction and overlapping between certificates and the carbon tax in its current configuration, the development of this instrument should be closely tracked during the elaboration of the EEC scheme. As discussed in Chapter 2, a clear purpose of the carbon tax should be to increase the cost of fossil fuels, which would then increase the attractiveness EE alternatives in all sectors. This could then impact the price and trading market for certificates. On the other hand, the carbon tax and certificates markets could have different implications for both the sources and uses of government tax revenue.

3.1.2 Analytical and modeling work on carbon pricing instruments and interaction with other policy instruments

This section presents analysis undertaken during the development of the MRP, as well as other relevant research, as background to what additional analytical and modelling work is proposed under the MRP. This includes some initial consideration of how an EEC scheme might interact with existing policies. The focus is on identifying what upstream policy analysis and modelling is needed during the first phase of MRP implementation, which is discussed in the following section.

The market size for an EEC scheme will depend on the target for EE, the projections on future energy demand of obligated stakeholders, and the estimated EE potential. The Under-secretary of Energy Savings and Efficiency is developing projections for energy demand and energy savings for each end-use sector. Not surprisingly, the overall savings of 10.2% across the economy is distributed unevenly across various sectors. Each sector includes a range of EE measures with different assumptions about penetration rates, technology development and underlying demand growth (e.g. energy savings for cogeneration in industry start in 2022, and in the case of buildings savings become relevant after 2024). These projections are the basis for the preliminary estimation of the potential market size for EECs in household and industry. Note that the transport sector also has EE options that are being investigated, and so this sector might also be included in a future EEC market, after the analysis of different transport CPI options presented in chapter 5.

This illustration of potential market size EECs focuses on households and large industrial users. Two possible scenarios for addressing energy savings in these sectors include: (a) targeting household consumption, based on an obligation for energy distributors, or (b) targeting large users with direct obligations to improve EE; both scenarios could be applied to electricity and natural gas consumption. As mentioned before, MINEM has detailed analyses of potential energy savings in household sector, across all fuels, including many of the measures that are
included in the National Energy and Climate Change Action Plan. This estimated energy savings in household sector are of 21 TWh for electricity and 2.42 billion cubic meters (BCM) for natural gas. Considering that not all the saving projections can be addressed by EECs, an initial assumption has been that between 5-25% of the estimated savings might be captured with an EEC market. Based on these estimations, for a scheme of targeting household sector in electricity the potential energy savings could be harnessed under an EEC scheme would equate roughly 1–5 TWh; and for natural gas in the household sector between 0.1 and 0.6 BCM.

For the case of industry, there are also a group of measures under evaluation for their potential energy savings, and these have been the base for the Energy Scenarios 2030 potential. In this context, if large users (i.e. >300 kW demand) were the obligated entities, potentially energy savings for this group would be 7.3 TWh in 2030. Capturing 5-25% of this using an EEC scheme would be a roughly 0.5-2 TWh worth of certificates. For the case of natural gas, would imply potential savings of 2.3 BCM through investment in EE. Capturing 5-25% of this savings would imply a market size of roughly 0.10 – 0.575 BCM (which could be measured as GJ or MWh-equivalent of primary energy).

Given this market size, the EEC scheme could make a substantial contribution to Argentina’s NDC mitigation goals for the energy sector, as outlined in National Energy and Climate Change Action Plan. As part of the first output for EECs, this contribution would be assessed quantitatively based on the most recent data and analysis.

- **Future analytical needs**

Based on these descriptions, complementary analytical work will be needed to evaluate the impact of the implementation of certificates schemes. The proposed analytical framework and tasks are presented section 3.1.3, which would cover both analysis of impacts on the energy sector and the national economy, as well as the evaluation of the high-level options for designing the schemes. These analytical tasks would include understanding:

- the interaction of EECs with the existing programs and other investments, as well as the interaction and overlap between the two certificate schemes;
- possible impacts of EECs and other policies on the cost of EE technologies over time;
- potential impacts of the EEC schemes on energy prices, energy prices and household income;
- options for an EE target for the EEC scheme, based on an in-depth evaluation of the energy consumption profile of households and large users for electricity and natural gas, EE opportunities in the different industrial branches, and barriers to EE in large users and households; this analysis will be building upon the existing information of the MINEM.
- a regulatory and legal analysis to decide on the most appropriate choice of obligated entities under each scheme, as to establish an appropriate institutional framework for EECs;

Note that the elaboration of a National Useful Energy Balance, based on final energy consumption survey for all sectors, detailing energy consumption by sources for each energy end-use (e.g. space heating/cooling, lighting, cooking, water heating, food conservation, etc.) will support these analytical tasks.

### 3.1.3 Presentation of plan and sequencing of analytical and modeling work to support decision-making

For an EEC scheme, certain policy analysis and modelling activities are necessary as a preparatory work to support and inform policy decisions. The key proposed deliverable for this
area would therefore be an ‘Energy Efficiency Certificate Pre-Feasibility Study’. This would be the first step before undertaking a full ‘Detailed Feasibility Study’ under later outputs. The Pre-Feasibility Study would address the following issues:

- Identifying appropriate modelling and analytical tools: Map available tools to determine which would be most appropriate to modelling the economic (i.e. macroeconomic and microeconomic), energy and emissions impacts of certificate schemes. The choice of tools would be related to, among other issues, expected data availability, and what tools are current in use in the relevant Ministries.
- Creating high-level scenarios: Given that there is a broad range of options for sectorial coverage, points of obligation, fuel coverage, goals/targets and even metrics for the scheme, create some high-level scenarios that help to cover the broader range of combinations possible, for purposes of the initial round of modelling. This activity could include scenarios with different types of obligated entities, e.g. end-users versus distributors, fixed versus dynamic obligation levels, electricity- and/or natural gas-related energy-saving measures, or many other variations. The starting point for the energy saving potentials underpinning these scenarios would be the work of the Under-secretariat for Energy Saving and Efficiency, which has several studies on EE potential and perspectives that have been included in the Energy Scenarios 2030 performed by the Under-secretariat of Energy Scenarios and Project Assessment.
- Modelling potential demand and market size: For the high-level scenarios selected and modelled, estimate how different decisions would affect market size and demand for EECs.
- Mapping impact of EEC instrument on remaining barriers to EE: While some barriers to EE have been addressed, there may be still be barrier specific to the implementation of an EEC scheme (or other instruments relevant in this context), which should be addressed later in the design phase. This could include, for example, lack of data on specific measures (e.g. EE motors, industrial cogeneration) or regulatory barriers (e.g. not all energy distributors are regulated by the national government). This analysis would also feed into the stakeholder engagement discussed below and can be developed as part of the consultations that must be done for other activities (e.g. Extended Roundtables under the NCCC, consultation tables for barriers analysis within the development of the plan, and learning networks).
- Assessing the potential impact of EECs on energy prices: Assess the interaction between certificate scheme and energy prices, in light of the recent increases in energy prices for many consumer groups. This would include a high-level evaluation of how EECs might affect consumer inflation and energy prices. A more detailed macroeconomic and socio-economic analysis would be conducted under later outputs.
- Analyzing the interaction with other policy instruments: Evaluate how a carbon tax could influence the market for EECs (e.g. indirectly through energy price changes) and the absolute magnitude of the impact of both instruments on obligated entities (e.g. facilities paying a carbon tax on top of paying penalties for failing to achieve energy saving targets).
- Identifying data needs: Identify what further data will need to be collected – if any - to conduct a feasibility study, such as sectorial/sub-sectorial energy consumption reduction potential, specific energy consumption, potential energy-saving measures options and the level of experience in the implementation of each type, technological and technical capabilities existing in the country, availability of different types of fuel and energy costs as a share of total costs for liable entities. As mentioned above, the National Useful Energy Balance and the Energy Efficiency National Plan development will provide critical inputs on the evaluation of future demand at obligated entities, so this activity would upon any outputs from those processes.
- Engaging stakeholder groups: identify key stakeholders to be consulted in the process of designing the scheme. This may include not only MINEM, but also other institutions such
as CAMMESA, ADEERA, AGUEREA, UIA, other institutions involved with industrial and residential consumption, technology suppliers, energy service companies, and even financial institutions open to analyze a potential involvement in the scheme. This could also include other institutions that have been developing studies on EE programs and barriers, as well as those working on EE scenarios.

- Providing recommendations and next steps: Develop and present recommendations on whether/how to proceed with EECs building upon the existing regulatory framework and the contextual circumstances of the country to the design or later phases of the mechanism. Also, facilitate a discussion among government and other relevant stakeholders on the opportunities and risks of an EEC scheme.

The key proposed output for this component in the MRP is:

- Output 3.1 Modelling and analysis to support decision on EECs as a carbon pricing instrument. The work to deliver this output is presented in Figure 30.

**Figure 30: Proposed analytical work to support decision making on EECs**

3.2 Market Readiness and Instrument Design (Building Blocks 3 & 4)

As part of developing a roadmap for an EEC scheme for Argentina, each section of this chapter addresses specific design issues and the activities required to move towards studying the implementation of a customized EEC framework. Section 3.3 then summarizes all the proposed outputs, activities, timeline and budget.

The preparation of this MRP included a review of international experience with EECs (see Annex B). The following are some of the take-away messages from these and other schemes that are important to consider when designing a EEC scheme:

- Schemes may target energy suppliers, retailers and/or distributors, given that these groups are best placed to identify and carry out energy savings with their customers.
- Having a standardized set of measures (i.e. where ex-post monitoring is not necessary) is useful during the first years of implementation, and also helps to calculate energy savings more efficiently.
• The energy saving measures portfolio should be updated periodically to factor in technology progress and new innovations.
• The scheme should be as simple as possible to reduce unnecessary red tape.
• A transparent registry is important to inspire confidence.
• Awareness-raising activities are important for the scheme roll-out.
• EEC schemes can also be applicable to the transport sector; however, activities in this sector are more complex to monitor, given numerous external factors such as weather and traffic conditions.
• Frequent (if not continuous) oversight of the scheme is important to make necessary readjustments to attain the desired effect.
• The regulatory framework should be stable and clear.
• Methodologies should be clear and easy to use.
• It is important have an efficient body in charge of issuing the certificates.
• Penalties must exist to enforce the scheme.
• The definition of baselines is a key factor to produce energy savings deemed as ‘additional’.25

Table 15 highlights key parameters to be considered when designing a REC scheme, and also indicates in which section of this MRP these issues are addressed. The choices under each heading will depend on national circumstances, goals and market structure, among other things.

Table 15: EEC scheme key design parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Options</th>
<th>MRP section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scope</td>
<td>Covered activities (e.g. energy distribution and retailing) and/or sectors (e.g. large end-users from specific energy-intensive sectors).</td>
<td>3.2.1 and Annex B</td>
</tr>
<tr>
<td>Coverage</td>
<td>Electricity, natural gas, LPG and/or other fuel types.</td>
<td>3.2.1 and Annex B</td>
</tr>
<tr>
<td>Institutional set-up</td>
<td>A single scheme regulator and administrator, collaboration between an administrator and operator, cooperation between different public entities and/or a combination between public entities and outsourced organizations (e.g. for registry operation).</td>
<td>3.2.4 and Annex B</td>
</tr>
<tr>
<td>Obligation measurement</td>
<td>Fixed, dynamic, and calculated in absolute terms or based on production (i.e. specific energy consumption).</td>
<td>3.2.1 and Annex B</td>
</tr>
<tr>
<td>Eligible measures</td>
<td>Standard, easy to roll-out measures and/or any type of EE measure available.</td>
<td>3.2.1 and Annex B</td>
</tr>
<tr>
<td>Certificate calculation</td>
<td>Ex-ante (estimation of the savings to be produced during the pre-defined lifetime of the measure), ex-post (calculated during the implementation phase of the project) or both depending on the measures included in the scheme. Additionally, certificates could be generated per unit of energy saved by an eligible measure or by the number of energy units an obligated entity exceeded its own target.</td>
<td>3.2.2 and Annex B</td>
</tr>
<tr>
<td>Additionality criteria</td>
<td>Determining a country standard or common practice and/or setting a baseline scenario that serves as a point of reference during energy savings calculation.</td>
<td>3.2.2 and Annex B</td>
</tr>
</tbody>
</table>

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25 This concept means that only energy savings exceeding current regulatory and market standards are accounted.
MRV options

- Monitoring: Streamlined calculations based on the number of units installed, estimation procedures requiring the measurement of one or more parameters, and specific methodologies proposed assessed and approved on a case by case basis.
- Frequency of calculations:
  - Reporting: Differentiated depending on the type of measure or all measures through an electronic interface.
- Verification: With or without the need of a verification report issued by an authorized third-party.

<table>
<thead>
<tr>
<th>Pricing controls</th>
<th>Floor price (e.g. minimum price), ceiling price (e.g. penalty), or no price controls at all.</th>
<th>3.2.3 and Annex B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexibility mechanisms</td>
<td>Certificate lifespan, certificate banking, obligation carry-over, participation of voluntary entities (e.g. end-users and energy services companies) and fungibility.</td>
<td>3.2.3 and Annex B</td>
</tr>
<tr>
<td>Environmental integrity</td>
<td>Excluding activities already incentivized by an existing policy instrument (e.g. REC scheme) or program (e.g. carbon credits), as well as linkage with other policy instruments registries.</td>
<td>3.2.2, 3.2.3, 3.2.5 and Annex B</td>
</tr>
<tr>
<td>Compliance options</td>
<td>Certificates only, a penalty only, or both.</td>
<td>3.2.3 and Annex B</td>
</tr>
<tr>
<td>Trading</td>
<td>Through the registry of the scheme or through authorized power exchanges</td>
<td>3.2.5 and Annex B</td>
</tr>
</tbody>
</table>

### 3.2.1 Target-setting and scope

The target-setting process of an EEC scheme is similar to the process for a REC scheme; nonetheless, in any country it can be much more challenging because of the large amount of information needed for the decision-making process, the diversity of participants and the wide range of measures that can become eligible, which depends on the sectors covered by this policy instrument. To set a target, a basic requirement is that the country should have identified the potential for energy savings, ideally with information broken down for each energy-intensive sector, or even by technology type (which in the Argentinean case has already been done for many areas). An important barrier for setting obligations on energy performance is, therefore, insufficient or low-quality data on energy consumption. The availability of high-quality information will also allow the scheme regulator to make projections on how energy demand will change with time and how such growth interacts with other factors (e.g. GDP, availability and consumption of fossil fuels, and GHG emissions), to be able to set appropriate targets and baselines for EE. In Argentina the consumption information and barriers are being gathered as part of other nationally and internationally funded projects, so any analysis under the MRP would build upon these outputs. Another important factor for considering a target is the GHG emission reduction commitments set by the country and the timeframes defined for those commitments. Based on all these factors, multi-year targets are generally established either in intensity (e.g. MWh per ton of production) or absolute terms.

A key consideration in setting a target is the impact of the obligations on tariffs and/or consumer product prices. Unlike a REC scheme, however, implementing cost-effective actions under an EEC scheme can potentially lower the energy service costs and product costs — by reducing energy use, this cost component of the final product price can also be reduced. This

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26 Permission for an obligated entity to carry out energy saving measures in facilities or assets that do not belong to its same sector or type of activity.
means that a stronger target will not necessarily increase prices in the long run, as long as there are ample opportunities for investment in EE opportunities with relatively short payback times but that might not be implemented otherwise, because of other barriers.

The EEC scheme does not necessarily have to include all sectors at once. Some sectors can opt in or out as the scheme evolves and the energy-saving potential in each case is depleted. Also, as the scheme progresses, barriers to some measures may be addressed so that it is not necessary for them to remain under this scheme. Similarly, as the scheme matures, more information will be gathered about other less explored measures, unveiling new cost-efficient opportunities for more facilities, making of them eligible to take part of the scheme.

In Argentina, the decisions on the EEC scheme scope, coverage and target will be built upon existing information but also on analysis performed as part of the PMR activities. First, target-setting for the EEC scheme should be linked to national EE targets investigated by the Under-secretary of Energy Saving and Efficiency for the official Energy Scenarios (2025, 2030). The draft Energy Efficiency Bill states that one of the main responsibilities of the application authority will be to develop a ten-year EE plan, which must contain targets and objectives for rational use of energy and EE (based on existing analyses).

As mentioned before a 10.2% level of energy saving by 2030 in an ‘Efficient’ scenario will be possible, compared to a ‘Trend’ scenario. Trend scenarios projections is constructed using a ‘top-down’ methodology including key drivers such as GDP, population, recent energy demand growth, price and income elasticity of demand, among others. They also incorporate the EE measures included in the Argentinean NDC and various actions being implemented or evaluated by the Under-secretary of Energy Saving and Energy Efficiency in different sectors (e.g. efficient public lighting, appliances, EE actions in industry, cogeneration, transport) with different assumptions. This study and its main results could provide the basis for the EE target that will be set under the draft Energy Efficiency Bill. Nevertheless, EE actions have also macroeconomic impacts that should also be considered. In addition, the EEC scheme may be designed to only address a portion of the overall national EE target. Given the potential economic and social impacts, a broad range of criteria should be used to evaluate an appropriate target.

The information from the projections of the Under-secretary of Energy Saving and Efficiency can also be the base for choosing the coverage of the EEC scheme – specifically which energy sources will be covered. Considering the importance of electricity and natural gas for total energy savings in the Energy Scenarios 2030, these fuels could be prioritized.

Regarding the scope of the EECs, the options could include focusing on energy distributors to promote investment in household sector EE (i.e. where the largest potential is) and/or focusing on large end-users from specific energy-intensive sectors (e.g. industrial sector). In addition, the scheme could eventually cover EE measures in the transport sector. For any of these options, it is crucial to evaluate different aspects such as: regulation of the sector, the structure of consumption and the EE possibilities and problems to implement actions.

In terms of focusing on energy distributors to promote investment in household sector EE, including potentially as a pilot phase of the EEC scheme, the target would need to consider the distribution of users among electricity distributors and provinces, the different tariff structures in provinces, and the potential impacts on consumer electricity bills (and how this might vary
by jurisdiction). The top five provinces represent more than 70% of total electricity consumption, with the remaining 30% spread over 18 other provinces. Figure 31 shows the distribution among regions.

Figure 31: Electricity demand by province, 2017

![Diagram showing electricity demand by province, 2017](image)

Note: NOA (Northwest region) includes Jujuy, Salta, Tucumán, Catamarca, La Rioja and Santiago del Estero; NEA (Northeast region) Misiones, Corrientes, Chaco, Entre Ríos and Formosa; Cuyo: Mendoza, San Juan and San Luis; Comahue: Neuquén, La Pampa, and Río Negro; Centro: Córdoba and Santa Fe; Cap Fed. + GBA, includes the City of Buenos Aires and the Great Buenos Aires; and Patagonia: Chubut, Santa Cruz y Tierra del Fuego.

Source: (ADEERA 2017)

There are more than 40 electricity distributors, each with different conditions in terms of number of users, electricity demand, spatial concentration, and tariff structures. The most relevant electricity utilities in terms of market size are: EDENOR and EDESUR (City of Buenos Aires and Greater Buenos Aires), EPESF (Province of Santa Fe), and EPEC (Province of Córdoba) (Figure 32). As mentioned before, there is not a unique national regulator for electricity distribution and tariffs and consumer expenditure on electricity in each area vary widely. The economic conditions of the distributors and their consumer base should therefore be considered as an input during the selection of the obligated entities.

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27 This is important because, as mentioned before, in the case of electricity there is no a national regulation and each electricity distributor is regulated by provincial entities and then electricity tariffs may differ considerably.
In the case of natural gas, the most relevant demand sectors are the intermediate consumption by power stations (40,000 m³/d); and the final demand from residential (29,640 m³/d) and industry (29,300 m³/d). For final consumption there are nine distributors (Metrogas, Gas Ban, Centro, Cuyana, Gasnea, Gasnor, and Camussi Gas Pampeana and Camussi Gas del Sur), with three of them (i.e. Metrogas, Gas Ban, and Camussi Gas Pampeana) accounting for 60% of total customers and 54% of total gas delivered per day (Figure 33).

Source: Elaborated based on statistical information from ADEERA

For the option of focusing on large end-users from specific energy-intensive sectors, the relevant information would be the sectorial and regional composition of large users, their average consumption, EE potential and measures, and the impact of energy costs on total production costs. In the case of electricity, large users represent 40% of total commercial and industrial consumption and 22.7% of total electricity consumption. Within the wholesale electricity market, 87% of the electricity large users are in the industry sector (Figure 34). In terms of geographic concentration, the six largest utilities (i.e. EDEA, EDELAP, EDEN, EDENOR, EDES, EDESUR) represent 50% of total consumption by large users. In the case of natural gas,
in 2017 the consumption from industrial large users represented 60% of industrial consumption, and 24.5% of natural gas total consumption. For industrial natural gas use, the information from ENARGAS shows that large users are the most important industrial consumers, with refineries, chemical, steel and oil accounting for more than 60% out of total sectorial consumption (see Figure 35). This information is relevant for determining the coverage for an EEC scheme and should be analyzed in more detail as part of setting the goals and scope of the scheme.

Figure 34: Share of wholesale electricity market for large users by sector, 2015

![Pie chart showing electricity market share by sector]

Source: MINEM – Anuario estadístico

Figure 35. Industrial consumption of natural gas by sub-sector (% total industrial consumption)

![Pie chart showing industrial natural gas consumption by sub-sector]

Source: (ENARGAS 2016)

The MRP activities would include 1) selecting the EEC target based on EE targets set by the government; 2) evaluating the feasibility of electricity and/or natural gas as the target fuel sources; 3) considering the options of focusing on distributors versus large users. Note that transport sector options could also be considered in the future, although this would follow the comprehensive analysis of CPIs for the transport sector proposed in Chapter 5. All these activities would require a consultation to the Under-secretary of Energy Saving and Energy Efficiency as well as other professionals from the Secretariat of Strategic Energy Planning and
the MAyDS. Additional consultation process should be developed to evaluate the impacts of the obligations in the selected sectors.

The following specific activities are proposed to address target-setting and scope issues for Argentina’s EEC system:

- **Update/develop an EE cost curve for Argentina for key sectors and energy sources**, building on existing/ongoing projects related to EE and based on local project data and international benchmarks for project cost, to illustrate the potential costs of different levels of an EEC scheme target. The supply curve would show the range of EE interventions possible in Argentina, organized based on their total savings potential (MWh/yr) and their cost of savings (USD/MWh). An example of an EE cost curve is shown in Figure 36. A similar curve could be developed for Argentina, but specifically for energy-efficiency options, to estimate the total cost (or savings) from achieving different EEC scheme targets. This could also be done for investment costs (USD/MW) in addition to average, to assess the total investment and financing requirements for different EE targets. The analysis would include understanding the dynamics over time and how this would relate to longer term targets. This analysis will draw upon that other tools and datasets used by MINEM (e.g. LEAP28 energy scenarios) for the evaluation of options for EE. Note that this curve could combine electricity and natural gas energy-efficiency options, or they could be presented as separate cost curves, depending on the scope of the EEC scheme. Much of the underlying data for this analysis may be collected under the EEA project discussed earlier, so the workplan for this activity would be adjusted based on the status and the outputs of the EEA project.

**Figure 36. Example of residential building energy-efficiency cost curve**


- **Analyze scope and coverage options**: Analyze the rationale for the choice of specific actors/sectors/sub-sectors and the target levels for EEC market size, certificate demand and possible price levels, based on the following quantitative and qualitative considerations:

28 LEAP is the Long-range Energy Alternatives Planning modelling system from the Stockholm Environment Institute.
- energy consumption data for large users and distributors – drawn from existing databases and the ongoing useful energy balance project - as well as the price elasticities of demand, and the implications of this for different EEC scheme target levels;
- the feasibility of having distributors or large users as obligated entities, taking into consider the national and provincial regulatory frameworks, their engagement in other ongoing EE activities, as well as which sub-groups might be most appropriate for a pilot phase of a scheme;
- developing BAU scenarios for the relevant entities, building upon the analysis and data collected under the EEA project described above, which would determine which activities or energy savings levels could qualify for EECs;
- potential impact on production costs for large energy end-users and the consumer energy bills in the household sector (which both could increase or decrease), with a sensitivity analysis for key drivers of costs;
- Understanding the barriers to a new EEC instruments in households and industrial sectors, to ensure that design of overall scheme has the potential to overcome these barriers;
- potential impacts on energy consumptions and GHG emissions in the relevant sectors; and
- the potential for using a standardized set of measures. As mentioned in the lessons learned, this can reduce costs and limit impacts on prices in the early phases of the scheme. The standardized measures could be based on the existing technologies and measures evaluated in the framework of the Efficient scenario in the Energy Scenarios studies.

- **Facilitate stakeholder engagement on target-setting**: The results of the energy-efficiency cost curve analysis, analysis of different metrics for EEC targets, and analysis of different scope and coverage options would be presented to key stakeholders, whose input could inform the government decision on a target trajectory and scope for the EEC scheme. The EEC market target would therefore be supported by all this analysis and the discussions with key actors, as well as any decisions made by MINEM about national EE targets under a new law for EE. The Extended Roundtables under the NCCC would form the basis of this engagement with stakeholders, including the meetings already set up as part of the development of the Sectorial Action Plan for the industrial sector.

### 3.2.2 MRV, data and compliance

Once the country has set its EEC scheme target, it must also provide means for obligated entities to meet it. The regulators of the scheme tackle this aspect in the following ways:

- In most cases the scheme regulator selects some measures, which will be entitled to produce certificates after undergoing a MRV process. The MRV will be more stringent as the complexity of the project increases.
- In some other instances, a specific energy consumption or absolute target are established individually per facility based on its historical performance. In this case, certificates are issued based on the units of energy savings attained that are in excess to the target set for the company.

In addition, countries may choose different energy saving calculation methods:

1) Deemed saving projects (e.g. lamps, boilers or engines), where results were directly obtained by multiplying pre-stated factors by the number of equipment units installed;
2) Simplified monitored projects (e.g. for district heating or public lighting), where the results depended on the measurement of some parameters; and,

3) Monitoring plan projects, in which case-by-case methodologies and baselines had to be developed by the project owner and later approved. The information of all the projects has to be submitted through a web-based platform.

Regardless of the mechanism selected to calculate certifiable energy savings, to preserve the credibility of the scheme it is fundamental to set a robust MRV system that levels the playing field for all the participants of the scheme. The MRV system is equally important to keep track on the scheme progress and effectiveness, which will throw important data to analyze possible revisions to the scheme for future compliance periods (see section 2.2.2 for more information on what a MRV system comprises and the related challenges and cost-reduction opportunities).

Argentina has a long history of collecting energy data (e.g. energy balances, energy prices, and costs for electricity generation), recently MINEM and CAMMESA have initiated a process to improve the frequency and quality of information, partly through the creation of the National Directorate of Energy Information (Resolution 761/2016). This Directorate oversees the integration of energy information systems and will become the central and integrated source of energy sector statistics, providing consistent and quality data under the principles of impartiality, openness, transparency and accessibility.\(^{29}\) This is a very important step towards improving data availability.

In terms of other official EE analysis, during 2016 the Under-secretary of Energy Saving and Energy Efficiency started developing a review of the EE indicators. These indicators will form an integrated set of ‘base EE indicators’ under the program with the Economic Commission for Latin America and the Caribbean (CEPAL)\(^{30}\) (MINEM – Under-secretary of Energy Saving and Energy Efficiency 2017). The indicators include global and sectorial energy intensity, power installed, electricity losses during transmission and distribution, and energy consumption trends by sector/sub-sector. Additionally, a training course on MRV for the management of EE projects was carried out in 2016. This course was performed under the bilateral framework with the Chilean Agency of Energy Efficiency of the Ministry of Energy from Chile. In 2016, the course for the Certified Measurement and Verification Professional (CMVP) - Efficiency Valuation Organization (EVO) was developed and a new edition is planned for 2018.

For the different actions in each of the national sectorial action plans, MAyDS has included a section for the monitoring of each alternative, which mentions some possible indicators to be used and the possible impacts in terms of emission savings. The plans still lack a detailed plan for monitoring, however, one which should include institutions, frequency, and criteria for evaluating the results. Monitoring plan for each of the mitigation measures are being developed during 2018.

The National Useful Energy Balance that Argentina is developing is a key data source and tool for understanding energy consumption trends, equipment efficiency, and energy consumption habits, based on conducting statistically representative surveys. This type of analysis could also be conducted on a smaller scale for a specific sub-sector, geographical region, or end-user type, to understand the EE opportunities within that particular group.

Therefore, the most relevant gaps that should be addressed in designing the EEC scheme may be: deep evaluation of EE potentials in some sectors and the instruments to surpass the

\(^{29}\) For some of the information available in the Directorate, see https://datos.minem.gob.ar/.

\(^{30}\) For more information on the BIEE, see https://www.cepal.org/dni/biee/#work.
barriers confronted (part of this information is being obtained though the existing initiatives); consolidation of information for the electricity sector among different data sources regarding frequency, base year, etc.; institutions that should be included in the registry of the EE actions and the certificates.

The following activities are proposed to address MRV, data and compliance issues for Argentina’s EEC system

- **Develop and implement a data collection system** for obligated entities under the EEC scheme, building on the framework and databases of the existing scenarios work by MINEM and data collected by CAMMESA. This would also build on the proposed National Useful Energy Balance analysis and could potentially support specific components of that analysis relevant to setting the targets for the EEC scheme.

- **Create MRV guidelines and tools for EE measurement under the EEC scheme:** Develop relevant templates, guidelines and tools to support MRV for EE improvements in key sectors, including measurement tools, frequency of data collection, and verification requirements. This activity can be based on the work of the BIEE program from CEPAL and the NDC monitoring (see (Secretaría de Energía del Ministerio de Planificación and Federal, Inversión Pública y Servicios 2014)

- **Create MRV guidelines and tools for compliance with targets:** Develop relevant templates, guidelines and tools to support MRV for compliance with targets (i.e. required energy savings, calculated target and compliance with target), including measurement tools, frequency of data collection, and verification requirements.

### 3.2.3 Enabling trading and fostering stability

The EEC schemes around the world have opted for different approaches to provide obligated entities with some flexibility and help them to meet their energy-saving targets. In the diversity of schemes briefly described in this document, some common features can be found but there are not two exactly similar sets.

The countries adopting EEC mechanisms as part of their energy-saving strategy will have to overcome the introductory phase, where the risk of under-delivery can be at its highest. Some other countries may decide to center their scheme on opportunities centered on buildings; however, as this is an area where most standardized and thoroughly assessed measures lie, the low-cost ones tend to run out swiftly and the scheme will have to consider broadening its scope to other sectors to find additional opportunities. The ability to simplify and scale-up measures is very important for the success of the scheme. This is associated to the flexibility of the mechanism in terms of the different measure alternatives but also to MRV choices (EPRS 016).

Some features that give flexibility to the obligated entities are the possibility of retaining certificates for its use or trading in future years and the option to trade certificates in the spot market and through bilateral contracts.

Similar to the discussion in section 2.2.3, the operation of the electricity market (and natural gas market) may have some lessons and relevance for new trading systems. Argentina’s electricity pricing system has been moving from a highly interventionist approach to a more market-based approach to price-setting, with the new wholesale market price. The wholesale market administrator, CAMMESA, will be critical in any future markets or exchanges for electricity-related attributes or certificates. This will require capacity building, however, to deal with new market models (see sections below institutional and regulatory frameworks).
case of natural gas, ENARGAS will be critical for regulation, but this will also require the intervention of MINEM.

The following activities are proposed to address trading issues for Argentina’s EEC system:

- Analyze possible flexibility mechanisms (e.g. carry-over option, banking options, certificate validity period), compliance options (e.g. penalty, certificates, or both), technology-specific carve-outs, change in sectorial coverage over time and/or multipliers (e.g. banded system).
- Estimate the impact of possible price collars (e.g. minimum price for certificates and a penalty).
- Design a mechanism for recycling funds collected due to the payment of penalties and how this revenue could be used.
- Analyze the potential participation of voluntary entities (e.g. energy supply companies).

### 3.2.4 Institutional and legal framework

The main participants in an EEC scheme are described below. Note that one key issue is the separation of the policy development/regulatory development from the administration of the scheme, since these require different capacities and skills. In addition, to prevent conflict of interest, the obligated entities should not be part of the regulatory functions and the verification of compliance.

- **Environmental policy ministry/agency**: Public entity in charge of setting-up the GHG emission reduction obligations, including those for the electric industry.
- **Energy policy regulator**: Public entity designated to implement energy policy through regulatory development and enforcement.
- **Administrator**: Entity delegated the authority for authorizing the issuance of certificates, creating and managing (and possibly also operating) the registry, verifying the fulfillment of requirement of certificates, submitting requests for information, MRV for ownership of certificates, and overseeing the integrity of the certificates.
- **Projects assessment body**: The entity that assesses projects against the eligibility requirements set by the administrator. This entity would be an existing public agency, an entity (public or private) created for this sole purpose or a mix of these two models.
- **Registry operator**: A state-owned entity or a third party appointed to manage the compliance platform for obligated entities.
- **Obligated entities**: Energy suppliers (e.g. electricity or natural gas) or end-users of a specific sector or size. Obligated entities must achieve energy savings targets at the end of each compliance period. Obligated entities can be issued certificates for achieving energy savings within their own facilities or by purchasing certificates from other entities.
- **Voluntary participants**: In some schemes, entities without any obligations, companies certified with ISO 50001, companies with an internal energy auditor or energy services companies, are also entitled to be issued certificates for energy savings achieved. Since voluntary participants are not required to deliver such certificates, they can sell such certificates to obligated entities, recovering some of the investment in EE.
- **Auditors**: Entities appointed by the scheme administrator to perform audits to energy saving measures, especially to those implemented in industrial facilities, where non-standard measures often take place.

The overview of exchange flows of information, certificates and financial resources is described in Figure 37.
As discussed earlier, the fact that the electricity distributors are regulated at the provincial level instead of the federal level could have important implications for the institutional set-up of an EEC system. Two of the most important electricity distributors (EDENOR and EDESUR) are regulated by the ENRE, while the rest of the distributors are under the regulation of provincial bodies (e.g. EPRE in Rio Negro, EPEN in Neuquén, ERSeP in Cordoba, or OCEBA in the province of Buenos Aires). In natural gas the situation is different, as ENARGAS regulates all the natural gas distributors in the country. This may have implications for setting national versus provincial targets for the scheme, as well as the roles played by different institutions.

Argentina has some existing institutions that could play a role in a REC scheme but may also need to develop some new institutional structures as well.

- Environmental policy ministry/agency: The MAyDS is responsible for climate change policy and coordination of all related policies for GHG mitigation. MINEM is responsible for the Energy Policy and the Under-secretary for Energy Savings & Efficiency responsible for the energy efficiency policy.
- Policy regulator: ENRE is the main public entity designated to implement electricity sector policy through regulatory development and enforcement, while ENARGAS performs this role for natural gas.
- Administrator: This could be a unit inside the relevant ministries, a unit at CAMMESA or ENERGAS, a unit within ENRE, or possibly a new dedicated entity set up to administer the scheme.
- Project assessment body: This could be part of an existing public agency, a new entity (public or private) created for this sole purpose, or a mix of these two models.
- Registry operator: This could be units within the electricity or gas market operators, administrators, or another dedicated entity, among other options.
- Obligated entities: This would be decided as part of the scope and coverage of the scheme (see section 3.2.1).
- Voluntary participants: These could be various private companies in Argentina, including energy supply companies, that may be interested taking part in EE projects of different

Figure 37: EEC scheme institutional framework
scales to produce certificates they could trade through the scheme to generate additional income.

- Auditors: These could be entities outside of government certified under existing energy auditing standards (e.g. ISO standards)

To address institutional and legal issues for Argentina’s EEC system, it is proposed that a plan should be developed for institutional, regulatory and capacity development, which would include:

- analysis of options and decisions on roles and responsibilities under the EEC scheme;
- a plan for institutional arrangements for rule-making, administration, market oversight;
- a capacity assessment and capacity-building plan for the relevant institutions and actors;
- evaluation of additional costs of institutional arrangements;
- a plan for developing necessary regulation, including rules related to ownership and taxation.

### 3.2.5 Technical infrastructure, including registry

Just like an emissions trading scheme (ETS), the wide range of obligated entities and variety of eligible measures presents a challenge for the EEC scheme. The technical infrastructure should therefore provide a comprehensive system to capture, manage and report all the relevant data securely, to ensure that the EECs represent real, additional energy savings. The most important component of this technical infrastructure is the registry. A registry can either be administered by a publicly-owned entity or by a third party: the choice will depend on the expected level of sophistication of the system and the costs and risks inherent in an outsourced service. Besides, an important part of all the administrative tasks is played by operational processes, including the follow-up on the relationship with users (e.g. entries and departures of users) and administering operations in the registry (e.g. certificates issuance, transfers and cancellations) (PMR 2016). A registry must also be capable of foreseeing and mitigating risks related to market-based mechanisms like the EEC scheme – for instance, double counting of the attributes linked to a certificate and security risks. Moreover, the registry must be capable of performing different activities, such as issuing and cancelling certificates, calculating the quantity of certificates held by each account, keeping track of the information related to each certificate unit (e.g. serial number, originating type of measure, and possibly even the chain of custody), and enabling transfers between accounts (PMR 2016).

Despite all the possible different functions of a registry, authorities can also rely on external power exchanges to carry out periodic auctions where obligated entities can purchase, partially or totally, their certificate requirements. See section 2.2.5 for further information on how a registry can increase in different levels of complexity.

There are several databases that have information on energy consumption that could be a useful starting point (e.g., those of MINEM, CAMMESA, ENRE, ENARGAS, AGUEERA, and ADEERA). Furthermore, in the context of the Resolution for Electro-intensive Users, as well as other recent policies, new energy consumption data is being gathered. If the Under-secretary of Energy Saving and Energy Efficiency is to compile all this information, then the same registry or part of it can be used for the EEC scheme. Similarly, the data collection process for the National Useful Energy Balance could feed into the registry development. The National Directorate of Energy Information may be the most relevant institution to house or oversee the registry. The Directorate could also provide a formal link between the Under-secretary of Energy Saving and Energy Efficiency and MAYDS.
In terms of the actual IT software and hardware needed for the registry, Argentina could consider four major options:

- sharing, by using a single common registry across jurisdictions/countries;
- custom developing, by drafting the functional and technical specifications for an IT services provider to develop a registry system from scratch;
- adapting, by contracting an IT services provider to adapt and implement an existing, open source or licensed registry;
- outsourcing, by using the software as the basis for a service model – the software vendor hosts and maintains the servers, databases, and code that constitute the registry application.

Any approach that involves the services of an IT company has specific advantages and disadvantages, and the final decision should consider factors such as the cost of maintenance, complexity, flexibility of the system, and data ownership.

A registry is unlikely to operate in isolation and is likely to interface with several IT systems and databases. Other systems and databases include the national GHG inventory, and other registries where there is linking between jurisdictions.

To address technical infrastructure for Argentina’s EEC system, it is proposed that there be a design registry system, including functional specifications, options for procurement, interface needed with other systems, and financing options, based on:

- analyzing current and future needs with regards to the use of the registry (e.g. also gathering information for reporting NDC progress and linking with other instruments);
- screening different registry system configurations, including functional specifications, interface needed with other IT systems and databases, risks management options (e.g. monitoring and controls, types of transactions and foreseen level of theft risk), and other technical infrastructure needed;
- evaluating options for development (i.e. sharing, developing, adapting or outsourcing);
- estimating costs of operation and financing options for registry and later management self-sufficiency; and
- assessing alternatives for auctions or bidding processes (e.g. enabling external systems like power exchanges).
### 3.3 Activities, deliverables and proposed budget

#### Table 16. Outputs, activities and deliverables for EECs

<table>
<thead>
<tr>
<th>Output</th>
<th>Rationale</th>
<th>Activities/description</th>
<th>Deliverables</th>
</tr>
</thead>
</table>
| **3.1 Modelling and analysis to support decision on the EEC scheme as a CPI** | Government and stakeholder groups need to understand the options and potential impacts of the EEC scheme, how it may interact with other policies, and how it may affect energy prices in the context of ongoing tariff increase, to decide on how to move forward. | - Screen modelling tools, identify specific data needs and barriers to EEC scheme and create high-level scenarios for EECs (e.g. scope, EE targets, type of obligation, compliance options, etc.)  
- Model potential demand and market size under different EECs scenarios, as well as potential impacts on energy prices, energy consumption, socio-economic (micro and macro) impacts and emissions  
- Assess interaction of EECs with other policy instruments, including carbon tax  
- Facilitate engagement and workshop with government and key stakeholders to discuss recommendations on EECs | EEC scheme pre-feasibility study for Argentina                           |
| **3.2 Definition of scope and target for EEC scheme**                  | Clarity is needed on scope and target to inform other decisions on detailed design. | - Update/analyze EE cost curve, building on outputs of National Useful Energy Balance, to estimate costs of different EEC scheme targets.  
- Analyze the rationale for scope, coverage and targets for the scheme, based on key quantitative and qualitative considerations (e.g. potential new legislation, micro- and macro-economic costs, voluntary market links, interaction with other EE policies).  
- Facilitate stakeholder engagement and government decision on EEC scheme scope, coverage, and target. | Formal decision on scope and target for EEC scheme                      |
| **3.3 Design of overall EEC scheme, including institutional, regulatory and technical infrastructure and MRV** | Enabling environment and infrastructure for EEC scheme should match the goals and scope of the scheme and draw upon international best practice, considering Argentina’s priorities and capacities. | - Develop and implement data collection system for obligated entities under the EEC scheme, building on existing data collection systems.  
- Develop relevant templates, guidelines and tools to support MRV for the EEC scheme, including verification requirements and guidelines.  
- Analyze possible flexibility mechanisms, compliance options, uses of penalty revenue and implications of voluntary entity participation.  
- Develop a plan for institutional, regulatory and capacity development.  
- Design registry system, including functional specifications, options for procurement, interface needed with other systems, and financing options. | EEC design study for Argentina                                           |
Table 17. Timeline for EECs

<table>
<thead>
<tr>
<th>Output</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1 Modelling and analysis to support decision on the EEC scheme as a CPI</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.2 Definition of scope and target for EEC scheme</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.3 Design of overall EEC scheme, including institutional, regulatory and technical infrastructure and MRV</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.4 Design a pilot phase for EECs scheme</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note that the budget below is presented for all the outputs related to EECs, but there would be a decision point after output 3.1, when government would confirm whether to move forward to the target-setting and design phases for RECs. The budget assumes that EECs activities would start in the fourth quarter of 2018, while the project management components for the MRP would start in the third quarter.

Table 18. Budget for EECs

<table>
<thead>
<tr>
<th>Output</th>
<th>Estimated support from PMR (US$)</th>
<th>Funding source (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2018 (3 mo) 2019 (12 mo) 2020 (6 mo)</td>
<td>PMR   Government Total</td>
</tr>
<tr>
<td>3.1 Modelling and analysis to support decision on the EEC scheme as a CPI</td>
<td>77,500 77,500 0</td>
<td>155,000 15,500 170,500</td>
</tr>
<tr>
<td>3.2 Definition of scope and target for EEC scheme</td>
<td>0 230,000 0</td>
<td>230,000 23,000 253,000</td>
</tr>
<tr>
<td>3.3 Design of overall EEC scheme</td>
<td>0 292,500 97,500</td>
<td>390,000 39,000 429,000</td>
</tr>
</tbody>
</table>
### 3.4 Design a pilot phase for EECs scheme

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>0</th>
<th>67,500</th>
<th>67,500</th>
<th>6,750</th>
<th>74,250</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
<td>77,500</td>
<td>600,000</td>
<td>165,000</td>
<td>842,500</td>
<td>84,250</td>
<td>926,750</td>
</tr>
</tbody>
</table>
4 Carbon taxation in Argentina

This chapter includes activities on the potential impact of Argentina’s recently approved carbon tax, as well as possible future extension to that tax regime. In terms of impact, the analysis would include modelling the carbon tax’s effects on energy prices, consumption, emissions, economic outputs and the distribution of income, as well as assessing the risks of ‘stranded assets’ in fossil fuel energy production and consumption. In terms of extensions or modifications of the current tax regime, after considering the pros and cons of the tax versus an ETS, the MRP activities would include: comparing the cost and abatement potential of the current different mitigation policies and instruments; assessing the use of carbon taxes to replace current distortionary taxes; modelling options for expanding carbon tax coverage; developing an MRV process for ex-post assessment of impact of carbon tax; and assessing the need for border tax adjustments in the long term.

4.1 Preparatory work to support and inform policy decisions on carbon pricing (Building Block 2)

4.1.1 Overview of policy context

Prior to the national fiscal reform bill that included the carbon tax, the tax structure for fuels included three main elements:

- A tax on liquid fuels and natural gas, which covered all types of fuels at different rates, including motor gasoline (with and without lead, and below/above 92 research octane number), naphtha or raw gasoline, natural and pyrolysis gasoline, gasoil, diesel oil, kerosene, turpentine, solvents, and natural gas for automotive use.
- An additional tax specifically on motor gasolines and natural gas.
- An additional specific tax on gasoil.

The tax burden on fuels prior to the fiscal reform bill was approximately 40% of the end-user price for gasoil/diesel and 45% for gasoline, including the turnover tax (it would be 5% lower if this were not included). Although this net tax rate is lower than in most OECD countries, government policy was to not increase overall tax levels at this time. Continuing this approach, the new tax structure - which in the case of liquid fuels includes a liquid fuels tax as well as the carbon tax - was designed to replace existing taxes, keeping the overall tax burden on the sector almost constant – although not necessarily the tax level on a given fuel type.

The carbon tax in this context will partially replace the three existing taxes on liquid and natural gas and impose a levy on fuels that is calculated based on their CO₂-intensity. The implementation of this carbon tax will, however, replace the taxes currently in force. The tax level on liquid fuels during each of the coming years will be the combination of the carbon tax and a unified fixed tax replacing the earlier levies. By having the tax fixed (i.e. in pesos per liter), the tax revenue will not change as the price of oil or other fuels changes and will provide more stability to the government in terms of tax revenue.

For the fossil fuels that were not taxed before (e.g. mineral coal, petroleum coke, and fuel oil), the carbon tax will be phased in gradually, starting at 10% of the target level in 2019 and rising

---

31 Natural gasoline as petroleum fraction distillation and pyrolysis gasoline as a by-product of high-temperature naphtha cracking during ethylene and propylene production.
10% annually until reaching the full USD 10/t\text{CO}_2e in 2028. This gives predictability to investors in the sector, who will know in advance the long-term trend in the tax rate. If, within five years, as part of the ‘global stocktake’ process carried out under the Paris Agreement, it is clear that the global GHG budget must be revised downward, governments – including Argentina’s – may decide to increase the tax levels significantly and/or include the remaining fossil fuels excluded from the tax by the law (mainly jet fuel, liquefied petroleum gas and natural gas). Argentina’s carbon tax creates a mechanism for the evolution of a future carbon-pricing pathway.

The distribution of tax revenue between the federal and provincial governments will not change with the introduction of the carbon tax. The distribution regime of the three taxes being replaced was a complex patchwork of specific distribution mechanisms across several laws. The fiscal reform law simplifies all those mechanisms into a simpler one which yields the same distribution of revenues. For fuel oil, mineral coal and petroleum coke, which are the new levied products after fiscal reform, the distribution of the funds will also follow the distribution regime between federal and provincial jurisdictions that applies to the liquid fuels levy.

Some additional details on the Argentina’s carbon tax include the following:

1. Liquid fuels for transportation that are derived from biofuels are not taxed either by carbon tax or the liquid fuels tax.
2. The tax applies to importers (i.e. companies that obtain liquid fuels and/or other hydrocarbon derivatives in all their forms, directly or through third parties), liquid fuel producers (i.e. companies that refine, produce, or manufacture liquid fuels and/or other hydrocarbon derivatives), and mineral coal producers and/or processors;
3. Exemptions are allowed for exported products, fuel used by international aircraft and fishing boats, or products used as inputs to chemical and petrochemical processes.

Given points #2 and #3 above, the taxes operate in practice as taxes on consumption and not on production, even though they are levied upstream. The tax will be calculated with the fixed amounts in pesos, as indicated for each product in Table 19.

**Table 19: Argentina’s tax on fossil fuels and carbon tax**

<table>
<thead>
<tr>
<th>Product</th>
<th>Fuel transference tax (pesos/liter)</th>
<th>Carbon dioxide tax (pesos/liter)</th>
<th>Total tax</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor gasoline, up to 92 RON</td>
<td>6.726</td>
<td>0.412</td>
<td>7.138</td>
</tr>
<tr>
<td>Motor gasoline, more than 92 RON</td>
<td>6.726</td>
<td>0.412</td>
<td>7.138</td>
</tr>
<tr>
<td>Virgin naphtha</td>
<td>6.726</td>
<td>0.412</td>
<td>7.138</td>
</tr>
<tr>
<td>Natural and pyrolysis gasoline</td>
<td>6.726</td>
<td>0.412</td>
<td>7.138</td>
</tr>
<tr>
<td>Solvent</td>
<td>6.726</td>
<td>0.412</td>
<td>7.138</td>
</tr>
<tr>
<td>Turpentine</td>
<td>6.726</td>
<td>0.412</td>
<td>7.138</td>
</tr>
<tr>
<td>Gasoil(^{32})</td>
<td>4.148</td>
<td>0.473</td>
<td>4.621</td>
</tr>
<tr>
<td>Diesel oil</td>
<td>4.148</td>
<td>0.473</td>
<td>4.621</td>
</tr>
<tr>
<td>Kerosene</td>
<td>4.148</td>
<td>0.473</td>
<td>4.621</td>
</tr>
<tr>
<td>Fuel oil</td>
<td></td>
<td>0.519</td>
<td>0.519</td>
</tr>
<tr>
<td>Petroleum coke</td>
<td>0.557*</td>
<td>0.557*</td>
<td></td>
</tr>
<tr>
<td>Mineral coal</td>
<td>0.429*</td>
<td>0.429*</td>
<td></td>
</tr>
</tbody>
</table>

\(^{32}\) Argentina produces two types of diesel oil: (1) Gasoil for agriculture and transport purposes, and (2) diesel that is only reserved for which it is not one of the other two (differences in quality specification), which is marginally produced and has restricted uses.
The carbon tax, how it could evolve, and how it may relate to other potential carbon pricing instruments, are all discussed further in section.

4.1.2 Presentation of plan and sequencing of analytical and modeling work to support decision-making

While the first phase of the carbon tax has already been approved as part of Argentina’s fiscal reform, the Ministry of Treasury has identified a number of key analytical and modelling issues that should be addressed to understand the potential impact of the carbon tax and how the tax could evolve or be expanded in the future. The detailed terms of reference for these activities would be developed by MAyDS and Ministry of Treasury at the outset of MRP implementation. The analytical activities have also been discussed with MAyDS, and areas of greatest importance and mutual interest fall into two main categories – carbon tax impacts and carbon tax extensions:

Carbon tax impacts

- **Model potential impact of current carbon tax**: while the carbon tax has been designed to replace existing taxes and not increase the overall tax burden in the short term, the taxes are differentiated for various fossil fuel types and will also change over time. In addition, the taxes on coal, coke and fuel oil will have an impact on the use of those fuels. An energy-economic modeling analysis would be undertaken to assess the potential impacts of the carbon tax on energy prices, consumption, emissions, economic outputs and the distribution of income. An early part of this activity would be to evaluate alternative modelling tools, such as linked energy-economic models, partial equilibrium models, and general equilibrium models. This would include, of course, the macroeconomic models already used by Ministry of Treasury, MINEM and Ministry of Transport, and how these could be used or modified for this analysis. The analysis should also consider different market features, such as energy tax composition in Argentina, market concentration, and price elasticities of demand for the most relevant fuels.

- **Assess the risks of ‘stranded assets’ in fossil fuel energy production and consumption**: This would include considering whether new assets in fossil fuel production and use (e.g. natural gas production and power generation) could be at risk due to future national and/or international climate policies that would reduce the economic life of these assets.

Carbon tax extensions

- **Compare carbon tax with emissions trading schemes (ETS)**: Evaluate the advantages and disadvantage of the current (or expanded) carbon tax versus an ETS with a similar coverage. Issues to be considered would include: implementation and administration costs, timetables for implementation (and their impact on the discounted value of emissions), international experience with both CPIs (and the key factors for successful implementation), uncertainty over the future global carbon pricing, and vulnerability to speculation.

- **Compare the cost and abatement potential of the different current mitigation policies and instruments**: This will include tax expenditures, subsidies and regulations. An example would be the RenovAr program, which includes preferential power purchase agreements (PPAs), tax exemptions, and other incentives for renewable power. By comparing the total public support allocated directly or indirectly to the emissions reductions (i.e. the avoided emissions from fossil fuel generation displaced by renewables), the total abatement potential (tCO₂) and cost of abatement (e.g.
USD/tCO₂e) could be estimated. Other programs with less direct impacts would be more difficult to quantify, but this analysis could explore the range of costs for those instruments and policies where some quantification was possible.

- **Assess the use of carbon taxes to replace current distortionary taxes**, and how this would influence industrial and commercial competitiveness as well as government revenue. This would include detailed policy analysis as well as macroeconomic modelling of the changes in tax levels across a range of products. In contrast to the current carbon tax implementation, this analysis could include scenarios in which the net price of fossil fuels and related products increases in real terms, and how this could flow through to the sectors consuming fossil fuels.

- **Model options for expanding carbon tax coverage**: Investigating how to implement taxation of CO₂e emissions in sectors and fuels not currently covered by the carbon tax or the land use law (i.e. ‘Ley de Tierras’) such as livestock emissions and industrial process emissions. This would include a carbon tax on natural gas, and the implications of this for energy sector development, particularly power generation expansion. This activity could be undertaken in parallel with the power sector analysis conducted under activity 2.1.2 ‘Model potential demand and market size under different RECs scenarios, as well as potential impacts on energy prices, energy consumption, transmission and distribution requirements, socio-economic (micro and macro) impacts and emissions.’

- **Develop a MRV process for ex-post assessment of impact of carbon tax**: This would include not only macroeconomic impacts but also impacts on national emissions in the long run (i.e. given that the short-term impact will be small, as the tax does not change the overall tax burden on most fuels).

- **Assess the need for border tax adjustments in the long term**. While current tax levels are modest, future increases in domestic carbon taxes could disadvantage domestic producers versus imports. This topic is under investigation in many countries as part of their climate policy development process. It would include an analysis of how carbon taxes affect the prices of domestic products versus finished imported products from different countries with differing carbon pricing regimes. It would also address the legal issues around WTO rules that do not allow for discrimination based on country of origin.

The key proposed deliverables in this area would be a ‘Argentina carbon tax impact study’ and ‘Argentina carbon tax extension study’, which would result from the activities described above and summarized in Table 20.

Key proposed outputs for this component of the MRP are:

- **Output 4.1**: Analysis of the short- and long-term impacts of the existing carbon tax; and
- **Output 4.2**: Analysis of possible extensions to the existing carbon tax program.
4.2 Activities, deliverables and proposed budget

Table 20: Outputs, activities and deliverables for carbon tax

<table>
<thead>
<tr>
<th>Output</th>
<th>Rationale</th>
<th>Activities/description</th>
<th>Deliverables</th>
</tr>
</thead>
</table>
| **4.1 Analysis of impacts of the existing carbon tax** | Government needs to understand the potential impact of the current carbon tax. | - Model the potential impact of the carbon tax on energy prices, consumption, emissions, economic outputs and the distribution of income.  
- Assess the risks of ‘stranded assets’ in fossil fuel energy production and consumption.  
- Capacity building workshop on assessing carbon tax impacts | Argentina carbon tax impact study |
| **4.2 Analysis of extensions to carbon tax program**  | Government needs to understand how the carbon tax policy compares with other policies promoting low-carbon technology, and how these could expand over time. | - Compare carbon tax to ETS  
- Compare the cost and abatement potential of the current different mitigation policies and instruments.  
- Assess the use of carbon taxes to replace current distortionary taxes.  
- Model options for expanding carbon tax coverage.  
- Develop a MRV process for ex-post assessment of impact of carbon tax.  
- Assess the need for border tax adjustments in the long term.  
- Capacity building workshop on analysis of carbon tax extensions | Argentina carbon tax extension study |

Table 21: Timeline for carbon tax

<table>
<thead>
<tr>
<th>Output</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Q4</td>
<td>Q1</td>
<td>Q3</td>
</tr>
<tr>
<td><strong>4.1 Analysis of impacts of the existing carbon tax</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Q4</td>
<td>Q1</td>
<td>Q2</td>
</tr>
<tr>
<td><strong>4.2 Analysis of extensions to carbon tax program</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note that the budget assumes that carbon tax activities would start in the fourth quarter of 2018, while the project management components for the MRP would start in the third quarter.

Table 22: Budget for carbon tax
### Output

<table>
<thead>
<tr>
<th>4.1 Analysis of impacts of the existing carbon tax</th>
<th>2018 (3 mo)</th>
<th>2019 (12 mo)</th>
<th>2020 (6 mo)</th>
<th>PMR</th>
<th>Government</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>61,250</td>
<td>183,750</td>
<td>0</td>
<td>245,000</td>
<td>24,500</td>
<td>269,500</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4.2 Analysis of extensions to carbon tax program</th>
<th>2018 (3 mo)</th>
<th>2019 (12 mo)</th>
<th>2020 (6 mo)</th>
<th>PMR</th>
<th>Government</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>151,250</td>
<td>453,750</td>
<td>0</td>
<td>605,000</td>
<td>60,500</td>
<td>665,500</td>
<td></td>
</tr>
</tbody>
</table>

| Total                                            | 212,500     | 637,500      | 0           | 850,000 | 85,000 | 935,000 |
5 Carbon pricing instruments for transport

This chapter presents the policy context and mitigation potential in Argentina’s transport sector, and preparatory work to support decisions on future CPIs in this sector. The activities would include reviewing and assessing CPIs for the sector, based on international experience and Argentina’s policy goals, as well as assessing the pre-feasibility for potential high priority CPI(s), including demand for credits from CORSIA. All of these activities would be preparatory work to support and inform policy decisions on carbon pricing and could lead to future work on developing CPIs for this sector.

5.1 Preparatory work to support and inform policy decisions on carbon pricing (Building Block 2)

5.1.1 Overview of policy context and mitigation potential

The transport sector in Argentina is responsible for a relatively high share of the country’s GHG emissions: 15% of overall emissions estimated for 2014, an appreciable increase since 1990, when the proportion reached 9% (MAyDS 2017d). The transport sector’s current share of emissions is significantly higher than its contribution to Argentina’s GDP, which is currently around 4%.33 There are three main reasons for this disproportionate contribution. First, an important portion of the transport sector is not included in the national accounts, namely the vehicles owned and operated by households. Argentina’s automobile fleet was estimated at 10.7 million vehicles in 2016 (ADEFA 2016), most of which belong to households. If the service provided by private automobiles were included in the income calculations, the percentage contribution of the sector to the overall GDP would increase greatly, possibly doubling. Second, the transport sector is a huge consumer of energy, which is not the case of the majority of the service industries (e.g. education, wholesale and retail trade, government and domestic service) which demand notably less energy per unit of employment. Third, the modal split of demand is strongly skewed towards road transport, which is a high consumer of hydrocarbon energy. According to the draft of the National Transport and Climate Change Action Plan (Gabinete Nacional de Cambio Climático, Argentina 2017), more than 90% of the country’s overall freight (measured in ton-km) is carried by trucks. In the case of intercity passenger transport no official information is available, but a rough estimate undertaken for this report apportions 59% of passenger-kilometers to automobiles and 33% to buses. For urban areas, information about the share of automobiles is also lacking, but mass transport seems to enjoy a relatively large proportion only in the Buenos Aires Metropolitan Area, which encompasses less than 40% of the overall urban population. The share of buses (the only mass transport option available) in the remaining urban areas is estimated to be lower; indeed, in medium-size cities, bus transportation has been strongly threatened by individual vehicles (both automobiles and motorcycles), leading to a radical downsizing – or even disappearance – of the former. As a consequence, transport is currently a prominent consumer of fossil fuels. Table 23 indicates its share in the consumption of petroleum fuels and natural gas, according to the latest Energy Balance available.

Table 23: Final consumption of natural gas and petroleum fuels (tons of oil equivalent), 2015

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Transport</th>
<th>Transport % total</th>
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</thead>
<tbody>
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<td></td>
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</tr>
</tbody>
</table>

Transport comprises 11.7% of the overall final consumption of natural gas and 70% of petroleum fuels (in terms of oil-equivalent tonnes). These shares are higher than the global averages where transport accounts for 7% of natural gas consumption and 64.7% of the consumption of petroleum fuels (IEA 2017a). Due to this high share of hydrocarbon consumption, Argentina’s energy authorities, as stated in Chapter 3 (Table 13) are now developing a dedicated and comprehensive environmental policy; some activities are already underway, such as vehicle fuel consumption performance labelling, training for energy efficient driving in the freight transport. In 2017, for example, MINEM worked with the regional cooperation platform LEDSLAC (Low Emission Development Strategies for Latin American and Caribbean), the outcome of which was the "Guide for efficient road freight transport for the Argentinian Republic ("Guía eficiente para el transporte automotor de cargas de la República Argentina").

Up to now, most of the policies adopted have been developed based on international norms and emissions standards, but some of them are grounded in local and global environmental concerns as well as energy policy goals (e.g. vehicle emission requirements and vehicle labelling). Thus, notwithstanding Argentina’s commitment to climate change mitigation, there have been limited attempts so far to implement market-based tools aimed at reducing emissions related to transport.

5.1.1.1 Existing policies that contribute to GHG emission mitigation

The main transport policy guidelines that refer to GHG mitigation are included in the National Transport and Climate Change Action Plan (MAYDS 2017c) prepared by the NCCC. This Plan is linked to the accomplishment of the NDCs pledged by Argentina. The Plan sets the contribution to reducing GHGs emissions, with 17 actions in the transport sector identified through the collaboration of the Ministry of Transport and MAYDS. These actions are estimated to reduce 7.6% of transport sector GHG emissions by 2030, relative to a BAU scenario. The actions are summarized in Table 10.

Table 24: Overview of National Transport and Climate Change Action Plan

<table>
<thead>
<tr>
<th>Mitigation action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban transport</td>
</tr>
<tr>
<td>Regional Rail Express Network (&quot;Red de Expresos Regionales&quot;)</td>
</tr>
<tr>
<td>Building of rail road over/underpasses</td>
</tr>
<tr>
<td>Promotion of low emissions light vehicles (hybrid, electric)</td>
</tr>
<tr>
<td>Energy efficiency vehicle labeling</td>
</tr>
<tr>
<td>Promotion of buses powered by alternative energy sources</td>
</tr>
<tr>
<td>Conversion of the bus fleet (from Euro 3 to Euro 5)</td>
</tr>
<tr>
<td>Biking lanes</td>
</tr>
</tbody>
</table>

34 The definition of ‘final consumption’ employed by the Energy Balances excludes the case of fuel combustion for power generation

35 www.argentina.gob.ar/ee/transporte/iniciativas-y-proyectos
Market Readiness Proposal - Draft | Argentina

| Bus rapid transit | Improvements in the air transport operation |
| InterCity passenger transport | Reinstatement of intercity passenger trains |
| Freight transport | Freight diversion from trucks to railways |
| | Program for ‘intelligent transport’ (best practices for truck companies) |
| | Training of truck drivers |
| | Conversion of the truck fleet with scrapping |
| | National Highway Plan 2025 |
| | Limitation of maximum speed for trucks |
| ‘Paseo del Bajo’ – Urban expressway |

Source: National Transport and Climate Change Action Plan

Many of these actions are already under development and/or implementation by the Ministry of Transport and MAyDS. Examples include the following:

- Training in EE for road freight transport companies
- Training in efficient driving for public sector fleets
- Inclusion of "energy efficient driving" material in courses for driving licenses
- Program for EE labelling for vehicles

In addition, MAyDS is leading the work on the transition from Euro 5 to Euro 6 fuels, which will be implemented soon.

5.1.1.2 Studies on energy-saving potential and GHG mitigation potential in the transport sector

Although overall GHG mitigation goals have been defined by the federal transport authorities in Argentina, the instruments to achieve those goals are under development. Argentina currently is carrying out in-depth studies on energy consumption and GHG mitigation in the transport sector; as a part of these efforts, MINEM will elaborate a Useful Energy Balance, with the funding from the European Union, which will deepen the knowledge about the energy consumption in transport (for more information about these issues see section 3.1.1).

The draft National Transport and Climate Change Action Plan, which includes estimates of emission reduction potential, refers to only one previous sectorial study, related to freight transport by rail (Barbero et al., 2015). In addition, analysis was undertaken as part of defining NDC goals in 2015. However, so far these assessments have not included a comprehensive assessment of the role of carbon pricing instruments in achieving national and sectorial policy goals. The federal government is strongly committed to overcoming this limitation and acknowledges the transport sector’s key role in efforts to reduce GHG emissions.

Transport has become one of the main issues on the government agenda, and important actions have been taken in recent years, while others are planned. For example, the metropolitan railway system has benefited from investments in rolling-stock and network extensions, and large projects are currently proceeding. In addition, important investment in rolling-stock and infrastructure rebuilding are being carried out in the intercity rail system, as well as an important investment plan for the highway network. As it is occupying political attention, transport is gaining momentum and there is investment in human capital. It is therefore a developing sector with increasing capabilities, which can be profitably exploited to attain GHG emission mitigation, despite its greater complexity than the energy sector.

Based on the review of transport in Argentina as presented above there is a clear rationale for focusing on the transport sector for carbon-pricing instruments, based on the following:
• Emissions levels and key drivers of emissions: The transport sector’s contribution to Argentina’s total GHG emissions grew from 9% in 1990 to 15% in 2014, and its share of total emissions is significantly higher than its contribution to the country’s GDP. The continued growth of car ownership, which in some cases is challenging and leading to the disappearance of public transport options, suggests that the sector’s growing contribution to total GHG emission is unlikely to be abated without targeted policies and instruments.

• Mitigation potential and options: Given that the transport sector in Argentina accounts for 11.7% of the final consumption of natural gas and 70% of the final consumption of petroleum fuels, this suggests there is a potential to appreciably reduce consumption of fossil fuels by the sector; savings in energy consumption due to increases in EE have been identify as part of developing sectorial climate change plans. In its draft National Transport and Climate Change Action Plan the government has already identified a significant number of concrete options which together could lead to a reduction of 7.6% of the GHG emissions produced by the transport sector in Argentina for 2030, when compared with a BAU scenario.

• National priorities: Transport has become one of the main issues in the government agenda, and important actions have been taken in recent years, while other are planned. Interest and investment in the transport sector is gaining momentum, as reflected in priorities 30, 31 and 32 of the Objectives for Sustainable Development. The timing is therefore good to explore the potential and possibilities for effective policies and instruments for GHG emission mitigation in the sector.

• Political will and interest: The country lacks any in-depth studies on energy consumption and GHG mitigation in the transport sector, and there is currently no assessment of the potential for transport sector carbon pricing instruments. The federal government is, however, strongly committed to overcoming this limitation, and it acknowledges the transport sector’s key role in efforts to reduce GHG emissions. The Ministry of Transport has already expressed an interest in exploring market-based instruments for the transport sector, with specific mention of performance standards with permit trading and crediting mechanisms such as CORSIA.

• Market experience in the target area and outcomes: There is already significant and relevant experience of carbon pricing instruments in the transport sector globally, and this experience has shown that the right instrument can make a significant contribution to mitigating emissions of GHGs. Relevant analysis for selecting market instruments for the transport sector has also been carried out for a number of PMR partner countries. This experience and analysis will be extremely valuable in ensuring that Argentina can identify the instrument best suited to its circumstances and priorities.

• Identification of non-GHG sustainable development benefits and links with other policy objectives: several of the 17 actions identified in the National Transport and Climate Change Action Plan are not solely focused on mitigation of GHGs but in most cases result in other sustainable development and policy objectives, particularly increased energy security and reduction of other pollutants (e.g. NOx, particulates). The use of CPIs to successfully promote mitigation of GHG emissions would, therefore, not only impact emissions of GHGs but would also contribute to the country’s sustainable development goals.

5.1.2 Analytical work undertaken during MRP preparation

36http://www.odsargentina.gob.ar/VinculacionODS
While the National Transport and Climate Change Action Plan includes a wide range of measures, it does not include the instruments that will be used to realize these outcomes. This is why PMR support is important for this sector, to identify how CPIs might help the transport sector to reach the mitigation goals. MRP preparation included, therefore, a review of both planned transport sector policies in Argentina, which may lead to mitigation of GHG emissions, and the international experience with relevant transport sector CPIs. The review of international experience is included in Annex C. This section presents some preliminary conclusions as to which CPIs may be relevant for the transport sector in Argentina. The very ‘high level’ nature of this assessment should be emphasized; the purpose of the exercise is to act as background for further detailed work and to highlight the needs for future analytical and modelling work, including exchange of opinions with stakeholders. We discuss here some features of the transport sector in Argentina and highlight some criteria that must be considered when addressing the country’s specific requirements. We also present an illustrative assessment of the CPI options and their suitability for each of the 17 planned actions.

The transport sector faces important challenges when compared to the energy sector in the execution of sectorial policies in general and specifically in the case of environment-related actions. This is mainly because transport is much more complex than the energy sector for the following main reasons:

- Transport is a service performed through different types of ‘technologies’ (or even solutions within one technology), but these options are not generally substitutable. Thus, it is difficult to forecast the impact of diverting transport demand from one option/mode to another (e.g. from road to railways). This is not the case, for example, with a shift of power generation technologies – say from thermal to hydro power.
- The number of agents involved in the transport operation is very large. Furthermore, organizations (firms) are heterogeneous, ranging from large and formalized units (e.g. railways, air companies, road agencies) to artisanal operators (e.g. truck owners).
- Reliable information, stemming from accounting data or similar, is only partially available; it mostly arises from regulatory frameworks or state-owned operators (e.g. public enterprises data, regulated bus services, traffic counts by the road agencies). Therefore, extensive field ad-hoc surveys are often unavoidable, especially when the private car is involved. Therefore, potential audits required by any kind of market solution are complex.

Bearing in mind these specific features of the transport sector, and based on international experience, a first preliminary allocation of possible CPIs can be outlined. The CPIs considered include a performance standard with permit trading, a domestic crediting scheme, international crediting (e.g. Article 6 mechanisms under the Paris Agreement and CORSIA), a domestic compensation scheme (i.e. government-funded payments for mitigation), a carbon tax and an emission trading scheme that includes transport. Table 25 suggests which CPIs may be appropriate for each of the 17 actions proposed by the National Transport and Climate Change Action Plan. This is a preliminary assessment, of course, but serves the purpose of illustrating what in-depth analysis will be undertaken with PMR support.

**Table 25: Illustration of which CPIs could potentially support actions in the National Transport and Climate Change Action Plan**

<table>
<thead>
<tr>
<th>Mitigation actions</th>
<th>Performance standard w/ trading</th>
<th>Domestic offset scheme</th>
<th>International crediting</th>
<th>Domestic compensation</th>
<th>Carbon/fuel tax</th>
<th>ETS</th>
</tr>
</thead>
</table>

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### Mitigation Actions

<table>
<thead>
<tr>
<th>Urban transport</th>
<th>Performance w/ trading</th>
<th>Domestic offset scheme</th>
<th>International crediting</th>
<th>Domestic compensation</th>
<th>Carbon/fuel tax</th>
<th>ETS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development of the Regional Express Network (‘Red de Expresos Regionales’)</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Building of railroad over/underpasses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Promotion of low-emission light vehicles</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>?</td>
<td></td>
</tr>
<tr>
<td>Energy-efficiency vehicle labeling</td>
<td>?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Promotion of buses fueled by alternative energy sources</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>?</td>
<td></td>
</tr>
<tr>
<td>Conversion of the bus fleet (from Euro 3 to Euro 5)</td>
<td>Y</td>
<td>?</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Biking lanes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Bus rapid transit</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Intercity passenger transport</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Improvements in the air transport operation</td>
<td>Y</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Reinstatement of intercity passenger trains</td>
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<tr>
<td>Freight transport</td>
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<td></td>
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<tr>
<td>Freight diversion from trucks to railways</td>
<td>Y</td>
<td>Y</td>
<td>?</td>
<td>?</td>
<td>?</td>
<td></td>
</tr>
<tr>
<td>Program ‘intelligent transport’</td>
<td>?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Training of drivers</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Conversion of the truck fleet with scrapping</td>
<td>?</td>
<td>?</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>National Highway Plan 2025</td>
<td></td>
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<tr>
<td>Limitation of maximum speed for trucks</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>‘Paseo del Bajo’ – Urban expressway</td>
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</tbody>
</table>

Note: "Y" means that the instrument is most likely applicable to this type of intervention; "?" means that the instrument is only partially appropriate for the intervention.

The first conclusion that arises from the above is that CPIs may not be suitable for all the 17 planned actions, as some of them are more traditional ‘command and control’ regulations. The remaining actions, however, could be relevant for application of CPIs.

A more detailed analysis is required to determine which CPI is most suited to the 12 planned actions. For this analysis, clear criteria need to be developed and agreed upon for determining the relevance of each CPI. As part of this analysis and development of relevant criteria, the specific characteristics of Argentina’s situation need to be considered; and, although an in-depth analysis goes beyond the remit of this report, the following points are considered important.

The aforementioned restrictions related to information, especially in the case of road transport, are of course relevant in the case of Argentina, as road transport is the main mode, both intercity and urban. As mentioned earlier, basic information about the sector is sparse, as is information about GHG emissions. As it happens in several countries, road freight transport, for example, is mainly provided by an atomized set of artisanal operators, within a completely unregulated framework, and relevant information is therefore of poor quality or not collected at all. Only in the case of public urban buses is information available for the main cities, although this is not well systematized.
In terms of the technical and institutional development within the transport sector, efforts have been carried out in recent years, as capabilities need to be enlarged to cope adequately with the current challenges and requirements in both public and private sectors. Capacities and resources in the transport sector are still less developed, however, than in the energy sector.

Argentina’s federal organization adds further complexity, for three main reasons. First, the frameworks that regulate transport may differ from province to province; this is especially the case for road transportation, but also for ports. Secondly, capabilities of the provincial agencies related to transport are heterogeneous (even more so at the municipal level). Last, but not least, the relationship between federal and provincial governments can be tense and subject to political bargaining; this is a factor that may lead to conflicts when running policies that involve government at both National and Provincial levels.

International experience and the specifics of Argentina’s case suggest that criteria need to be developed when discussing the potential of CPIs for GHG mitigation and selecting the most suitable options. These criteria should take the following challenges into consideration:

- Actions where GHG reductions or other environmental targets are the main goal are preferable (as opposed to actions which prioritize, for example, energy security). If this is not possible, a strong commitment from the agent responsible for the planned action must be obtained, as the responsible agency may not be incentivized to accomplish the requirements related to a CPI.
- Actions should be relatively easy to implement, in particular concerning MRV requirements. Audits should be feasible in the present conditions or require minimum additional arrangements, at least at a first stage.
- From an institutional perspective, the options must:
  - involve a limited number of agents;
  - avoid the requirement of generalized agreements with all provinces; and
  - rely as much as possible on institutional arrangements already in place.

- National government has prioritized CPI actions for both freight and urban passenger transportation.
- Finally, the current fiscal restriction must also be taken into account. The national government has committed itself to reduce the fiscal burden on the private sector, which amounted to almost 36% of GDP in 2016 (including taxation of the national, provincial and municipal levels37). On the other hand, the primary deficit in 2017 reached 3.8% of GDP (6% of GDP when interest on the public debt is added), for the federal government.

In terms of prioritizing which options to assess during MRP implementation, a few considerations are important. First, Argentina already has a carbon tax on liquid fuels (which was discussed in chapter 4), so this does not need to be part of the MRP analysis. Secondly, because Argentina is not considering an ETS for other sectors, creating an ETS only for transport would not be effective (and there are no international examples of this). Thirdly, although a domestic compensation scheme could address some of the same actions as a domestic crediting scheme, the additional burden on government budget makes this an unlikely policy instrument in Argentina currently. This leaves three main instruments that would be analyzed in more detail during MRP implementation: international crediting (including CORSIA – see next section), domestic crediting, and a tradable performance standard.

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37 Consolidated data for 2017 are not yet available.
5.1.3 Implications of CORSIA

At its 39th assembly in October 2016, the International Civil Aviation Organization (ICAO) adopted the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA). The scheme would allow airlines to use tradable emissions reduction units (or emissions allowances) generated from international mechanisms established or recognized under the UNFCCC and the Paris Agreement, provided that they meet certain criteria. These units would be used for the airlines to achieve ‘carbon neutral growth’ after 2020 but offsetting the residual emissions from air travel. In other words, any growth in emissions beyond 2020 levels would need to be offset by purchasing emission reduction units in accordance with the CORSIA rules. This means that CORSIA will not be a new crediting mechanism per se, but rather a new source of demand for emissions reduction units issued by other approved mechanisms. Recent research suggests that the demand for such units from CORSIA could be 40 MtCO$_2$e per year from 2012–2023 and 90 MtCO$_2$e from 2024–2026, with further increases after this (Schneider and La Hoz Theuer 2017).

The ICAO Council, with technical contribution of the Committee on Aviation Environmental Protection, will develop standards and recommended practices, related guidance material on an MRV system, and the eligibility criteria for emission units for CORSIA. This material is under development and expected to be adopted by the Council by the end of 2018. The Council will also establish a standing technical advisory body to make recommendations to the Council on the eligible emissions units for use by CORSIA.

ICAO released a document in December 2017 on the ‘Proposal for the First Edition of Annex 16, Volume IV, concerning Standards and Recommended Practices (SARPs) relating to the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA)’ (ICAO 2017), which contained Annexes on the eligibility of emission units for the CORSIA system. This draft document says that ICAO will issue a document called ‘CORSIA Eligible Emission Units’, which will list all unit types and programs that are acceptable for CORSIA (i.e. not all units from a given program may be eligible). The determination of eligibility will be based on ‘CORSIA Emission Unit Eligibility Criteria’, which include the following:

- Carbon offset programs must generate units that represent emissions reductions, avoidance, or removals that are additional.
- Carbon offset credits must be based on a realistic and credible baseline.
- Carbon offset credits must be quantified, monitored, reported and verified.
- Carbon offset credits must have a clear and transparent chain of custody within the offset program.
- Carbon offsets crediting must represent reductions that are permanent.
- Carbon offset systems must have measures in place to assess and mitigate incidences of material leakage.
- Carbon offset systems must ensure that credits are only counted once towards a mitigation obligation.
- Carbon offset credits must represent emissions reductions, avoidance, or carbon sequestration from projects that do no net harm (i.e. comply with safeguards and not violate regulations).

These documents suggest that ICAO will approve entire programs (or parts of those programs) for inclusion in CORSIA, not individual projects. In addition, it seems likely that individual airlines and countries will not be able to decide which units are eligible, but that this will be decided by the ICAO Council. In any case, all mechanisms or units must be recognized under the Paris Agreement and UNFCCC, since this is a provision in the overall agreement. Therefore, the safest route to supplying units to CORSIA in the short- to-medium-term would be to use...
existing internationally approved crediting mechanisms (e.g. CDM), or new mechanisms that are being designed for Article 6 trading under the Paris Agreement, for which the “rulebook” is currently being developed. Focusing on projects that would meet the requirements of existing schemes would increase the chance that emission units from these projects would eventually be eligible for supply into the CORSIA.

It is important to note that CORSIA will not be restricted to emission units from the transport sector but could potentially source credits from all the sectors that are eventually covered by the Article 6.2 and Article 6.4 mechanisms under the Paris Agreement. This is important in terms of Argentina’s strategy because, although there have been some successful crediting programs in the transport sector, this has proven to be one of the most challenging areas under crediting schemes. As Figure 38 shows, less than half of a percent of CDM projects and credits issued were from transport. That said, there have been a few large successful transport projects, particularly bus rapid transit projects.

**Figure 38: Share of CDM projects and CERs by project type**

<table>
<thead>
<tr>
<th>% Projects</th>
<th>% CERs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renewables</td>
<td></td>
</tr>
<tr>
<td>CH4 reduction &amp; Cement &amp; Coal mine/bed</td>
<td></td>
</tr>
<tr>
<td>Supply-side EE</td>
<td></td>
</tr>
<tr>
<td>Demand-side EE</td>
<td></td>
</tr>
<tr>
<td>HFCs, PFCs, SF&amp; N2O reduction</td>
<td></td>
</tr>
<tr>
<td>Fuel switch</td>
<td></td>
</tr>
<tr>
<td>Afforestation &amp; Reforestation</td>
<td></td>
</tr>
<tr>
<td>Transport</td>
<td></td>
</tr>
</tbody>
</table>

Note: Transport is 0.4% of projects and 0.4% of CERs up to 2020
Source: Fenhann (2018)

5.1.4 **Presentation of plan and sequencing of analytical and modeling work to support decision**

For transport, this is a roadmap for assessing and choosing whether to use carbon pricing and which instruments to prioritize for further study. In other words, the focus will be on developing and delivering a ‘Carbon pricing instruments for Argentina’s transport sector study’, which would include results of analytical work to determine the optimum CPI(s) for the sector. This study will also include a plan for further analytical and modelling work, if any.

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38 This does not mean that the CDM will necessarily meet all of the CORSIA criteria, but that it is the most well developed and widely used crediting scheme under the UNFCCC.
needed to support the Ministry of Transport in making a decision on whether and how to pursue CPIs. This will build on the goals set in the National Transport and Climate Change Action Plan, as well as the transport EE programs led by the MINEM, and illustrate how CPIs could be used to support the measures included in this plan. The study for the transport sector would include the following activities:

- Review of options: The previous sections provide an overview of the mitigation actions which are planned in the transport sector. So far, however, these actions are presented in a draft plan, the basis for which is limited in terms of analysis and modeling. The aim of this step would be to confirm the values and impacts of these actions through more focused review and abatement cost analysis.

- Stakeholder consultation: Stakeholder engagement and consultation with relevant institutions in the country should be undertaken, to determine the set of criteria against which the possible CPIs could be evaluated. Examples of possible criteria are provided in section 5.1.2, and these will be reviewed and expanded following consultations and approval with relevant stakeholders. During this step, an agreement would be reached with stakeholders as to which actions of the plan should be prioritized for further assessment, taking into account the earlier findings. Stakeholder consultation will also be undertaken near the end of the proposed activities to reach a final agreement as to what options should be developed further.

- Analysis of CPIs: During this step an in-depth analysis should be carried out on which instruments would be most relevant for the actions planned in the transport sector, according to international experience and specific local conditions, especially regarding existing and required institutional and technical capabilities. This analysis will include the identification of the government agency that would regulate each instrument. Additionally, the implications of each tool for the distribution of roles between federal and provincial governments would be carefully considered.

- Ranking of CPIs: The definitive set of criteria developed and agreed will be applied to the CPIs identified to identify and prioritize which instrument(s) is/are most relevant in Argentina, and which actions as identified in the National Plan are most suited to the application of CPIs. The results will also be important in assessing the extent to which the CPIs can contribute to the cost of mitigation measures. The review undertaken during this step will also assess interactions of the various CPIs with existing or planned policies and instruments, including the carbon tax. The result will be a summary of the more suitable instruments for the selected actions, and elaboration of a ranking based on their feasibility.

- Assessment of CORSIA: As part of the analysis of international crediting as a CPI, the analysis would also cover tracking the development of the CORSIA rules and their relevance for Argentina. This activity in the proposed in the MRP would include analysis of CORSIA as a possible source of demand for emission reduction units or credits from Argentina, with a focus on the transport sector but also considering what types of emission reduction projects in other sectors might benefit from CORSIA demand for emission units.

- Pre-feasibility: Based on the ranking of CPIs, a more detailed assessment will be carried out on the prioritized CPIs, which would include identifying institutions that are key stakeholders for further work and implementation of the CPIs, the technical and institutional capacity needs, identification of data needs to conduct analysis and modeling, and identification of the modelling and analytical tools required.

The proposed output for this component of the MRP is:

- Output 5.1: Analysis and prioritization of carbon pricing instruments for transport.
5.2 Activities, deliverables and proposed budget

### Table 26: Outputs, activities and deliverables for Transport

<table>
<thead>
<tr>
<th>Output</th>
<th>Rationale</th>
<th>Activities/description</th>
<th>Deliverables</th>
</tr>
</thead>
</table>
| 5.1 Analysis and prioritization of CPIs for transport | Government needs a more in-depth assessment of the best option(s) for a CPI targeted at the transport sector | - Review options for mitigation of GHG emissions and assess impact of a carbon price.  
- Analyze and rank possible CPIs using criteria agreed with stakeholders.  
- Prepare pre-feasibility which would include review needs for further development and implementation of chosen CPI(s).  
- Analyze and track development of CORSIA system as a possible source of demand for emission reduction units or credits from the Argentina, particularly from the transport sector.  
- Consult stakeholders throughout with focus on agreeing evaluation criteria, action plans and reaching final agreement on development of options. | CPIs for Argentina’s transport sector study |

### Table 27: Timeline for Transport

<table>
<thead>
<tr>
<th>Output</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1 Analysis and prioritization of CPIs for transport</td>
<td>Q4</td>
<td>Q1</td>
<td>Q2</td>
</tr>
</tbody>
</table>

Note that the budget assumes that the transport activities would start in the fourth quarter of 2018, while the project management components for the MRP would start in the third quarter.

### Table 28: Budget for Transport

<table>
<thead>
<tr>
<th>Output</th>
<th>Estimated support from PMR (USD)</th>
<th>Funding source (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2018 (3 mo)</td>
<td>2019 (12 mo)</td>
</tr>
<tr>
<td>5.1 Analysis and prioritization of CPIs for transport</td>
<td>51,667</td>
<td>103,333</td>
</tr>
<tr>
<td>Total</td>
<td>51,667</td>
<td>103,333</td>
</tr>
</tbody>
</table>
6 Cross-cutting activities: organization, management, communication and consultation (Building Block 5)

This chapter outlines the proposed organizational and management framework for coordinating PMR grant-funded activities. In doing so, it maps out the main institutions and stakeholders that will contribute to the development and decision-making process of the market-readiness components described in the previous components. This chapter also identifies cross-cutting activities for communication, consultation and capacity building, which would be undertaken during the MRP implementation phase.

6.1 Organization for grant management activities

MAyDS would be the main agency in charge of the implementation of the project, within the Secretariat of Climate Change and Sustainable Development. The latter is also the technical coordinator of the NCCC and would keep it informed of MRP implementation and articulate to have validation sessions within the NCCC’s sectorial roundtables. Key government ministries and agencies involved in the project also include the Ministry of Energy and Mining (MINEM), the Ministry of Transport and the Ministry of Treasury, which compose the PMR Task Group. MAyDS would chair the PMR Task Group. Figure 39 describes the institutional arrangement envisioned for Argentina’s MRP implementation phase, which would be established at the start of the project.

**Figure 39: PMR project’s governance**

PMR Task Group goal would be to ensure coordination and proactive engagement across several ministries and departments and ensure the project’s alignment with national policies and programs. MAyDS would be responsible for verifying the project’s coherence with established objectives and act as the focal point for all the international and domestic stakeholder’s activities. Moreover, it would oversee the overall alignment at a strategic level for each of the focal areas of the project. Operationally, the NDCC will be the leader for the overall coordination of the MRP implementation and will also liaise with the NCCC.
The Executive Coordinator for PMR Activities would be represented by the Secretariat for Climate Change and Sustainable Development and would be responsible for managing the project and facilitating coordination with relevant ministries to address at a higher political level and arbitrate any potential conflicts within the project.

Argentina would establish a Project Management Task Force (PMTF), which would be responsible for the overall guidance of the project management and overseeing day-to-day activities, including adherence to annual work plans, achievement of planned results as outlined in the MRP, cross-cutting activities, and the use of PMR grants through effective management and review mechanisms. The PMTF would be headed by the project coordinator, who would coordinate two main areas: communication and stakeholder engagement activities and the program management by project’s components. The program management area would be structured by each of the components of the project with the aim to technically support and assist the project coordinator and the staff from the key relevant involved Ministries with (1) terms of reference (TORs) elaboration, (2) dialogue and general coordination between consultants and key relevant ministries’ staff (PMR Task Group), (3) revision of final products, and (4) articulate the feedback provision by government.

The PMTF should also be in strong connection with the PMR grant delivery partner. It is the intention of Argentina, and an item that has been strongly discussed and consented, to have as a delivery partner the World Bank. To have a bank executed project will enable Argentina to quickly move forward towards MRP implementation after the grant approval and comply with the proposed timeline. Financial management and procurement would then lie within the World Bank’s structure.

The PMTF should monitor the overall implementation, oversee the progress of the implementation of the MRP, and monitor project deliverables. The coordinator should also prepare and present regular reports on progress made in relation to the timeline, the level of expenditure of the budget so far, and all other information meaningful for accurate assessment of the project.

The program management area would mobilize the PMTF for the full project tenure to ensure the availability of experts and consultants until project completion. This area would also be responsible for conducting and disseminating analysis and synthesizing results. It would work with the support and input of the PMR Task Group to ensure high-quality technical implementation. The PMR Task Group will constitute the main mechanism of decision-making and technical coordination among the relevant involved ministries.

Lastly, the success of the project will also depend on the communication, consultation and engagement strategy envisaged by government. The communication and stakeholder engagement area will assist the Project Coordinator in the design and implementation of the outreach strategy and in organizing and articulating the capacity building workshops and cross-cutting events.

6.2 Consultation, communication and outreach among key ministries and stakeholders

This MRP was elaborated by the MAyDS and was validated and endorsed by the PMR Task Group through a process of two technical meetings between the consultant consortium and technical representatives of each of the relevant Ministries. The valuable feedback received from these two rounds of validation was considered in this draft. Moreover, the NCCC has been informed through the relevant sectorial roundtables on the status of the PMR project nationally as well as MRP activities.
The main mechanism to ensure that all PMR-related considerations are fully integrated into Argentina’s development strategy is the already existing platform of the NCCC and its sectorial and extended roundtables. In this regard, the PMTF will be in charge of both reporting the project’s main milestones to the sectorial roundtables, as well as coordinating its validation of the project’s main milestones to the sectorial roundtables, according to the theme topic under discussion. The relevant NCCC roundtables (both regular and extended) supporting PMR activities are the finance, energy and transport roundtables and their respective extended roundtables, where key stakeholders participate fully. Benefitting from this well-structured mechanism, PMR activities can be well discussed and validated among stakeholders. Table 29 summarizes the key sub-national government agencies, private sector entities, and key civil society representatives who will be involved in this process under the overarching NCCC according to the PMR’s relevant sectors.

**Table 29: PMR Argentina key stakeholders**

<table>
<thead>
<tr>
<th>Energy sector</th>
<th>Transport sector</th>
<th>Cross cutting</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAMMESA</td>
<td>Universidad Tecnológica Nacional -UTN</td>
<td>Bariloche Foundation</td>
</tr>
<tr>
<td>CADER</td>
<td>Consultora GIA Soluciones</td>
<td>Di Tella Foundation</td>
</tr>
<tr>
<td>ENRE</td>
<td>Volkswagen Argentina S.A.</td>
<td>Fundación Vida Silvestre</td>
</tr>
<tr>
<td>EDENOR</td>
<td>IT-UNSAM</td>
<td>Greenpeace</td>
</tr>
<tr>
<td>EDESUR</td>
<td>FEDEEAC</td>
<td>Consejo profesional de Ingeniería Civil</td>
</tr>
<tr>
<td>EPEFS</td>
<td>Mercedes Benz</td>
<td>Avina</td>
</tr>
<tr>
<td>EPEC</td>
<td>Cámara Argentina del Transporte Automotor de Mercancías y Residuos Peligrosos</td>
<td>FARN</td>
</tr>
<tr>
<td>INTI</td>
<td>Cámara Argentina de Biocubustibles</td>
<td>YPF S.A.</td>
</tr>
<tr>
<td>CREARE</td>
<td>Instituto Argentino del Petróleo y el Gas</td>
<td>Central de Trabajadores Argentina</td>
</tr>
<tr>
<td>AAEAO</td>
<td>Red Argentina de Municipios frente al Cambio Climático</td>
<td></td>
</tr>
<tr>
<td>ADEERA</td>
<td>Fundación Energizar</td>
<td></td>
</tr>
<tr>
<td>AGUEERA</td>
<td>Ingeniar Tecnología Sustentable</td>
<td></td>
</tr>
<tr>
<td>UIA</td>
<td>Asociación Amigos de Parques Nacionales</td>
<td></td>
</tr>
<tr>
<td>CAFEEST</td>
<td>Foro del Buen Ayre</td>
<td></td>
</tr>
<tr>
<td>ENERGAS</td>
<td>Fundación Sustentar</td>
<td></td>
</tr>
<tr>
<td>Wind Argentine Cluster</td>
<td>Fundación Ecoandina</td>
<td></td>
</tr>
<tr>
<td>Natural gas distributors</td>
<td>Universidad de Ciencias Empresariales y Sociales</td>
<td></td>
</tr>
<tr>
<td>CADIEEL</td>
<td>Universidad de Buenos Aires</td>
<td></td>
</tr>
<tr>
<td>Comisión Nacional de Energía Atómica</td>
<td>Consejo Empresario Argentino para el Desarrollo Sostenible</td>
<td></td>
</tr>
<tr>
<td>Energía Argentina S.A.</td>
<td>Universidad Nacional de San Martín -</td>
<td></td>
</tr>
<tr>
<td>Enel Argentina</td>
<td>Universidad Nacional de San Juan</td>
<td></td>
</tr>
<tr>
<td>Pampa Energía</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asociación Argentina de Energías Renovables y Ambiente</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
6.3 Capacity-building

Technical training and capacity-building requirements specific to each of the components of this MRP, energy certificates schemes, transportation and carbon tax related outputs, are included in the respective components (e.g. activities listed for carbon tax studies in Chapter 4, workshops as part of outputs 2.1 and 3.1, capacity building under outputs 2.4 and 3.4). They include institutional and capacity development for those schemes in the relevant sub-sections. Technical workshops to support the development of the activities and the governmental decision-making are also planned in each of the building blocks (e.g. 2.1 and 3.1). The PMTF will, however, also conduct two additional workshops on the subject of carbon pricing more broadly – and to report back on MRP activities – for various government officials and stakeholders. The purpose of these workshops is to contextualize the proposed CPI(s) within Argentina’s climate and development priorities; promote a clear and coherent position across the government and non-state actors on the benefits of carbon pricing; and ensure stakeholder buy-in for all activities under the MRP.

6.4 Monitoring, evaluation and risk mitigation

The PMTF will ensure that the outputs are useful, time-bound, and can realistically be achieved within the proposed time frame. Thorough monitoring and evaluation (M&E) of deliverables and outcomes will be conducted every six months. M&E reports will be submitted to the PMR Task Group for review and necessary action. This process will, therefore, ensure that the activities are implemented in timely manner and that the timelines and milestones presented in the MRP for the outputs are met. Where there are potential delays, the PMTF would investigate the reasons of delay and expected timelines. In addition, budget may be re-allocated based on progress in the different components, to ensure that the PMR support is utilized effectively. This process will ensure that there is the regular oversight by the PMR Task Group and allow for proactive corrections. M&E will culminate in synthesis report listed as a separate activity in the Gantt chart.

Several risks may emerge during the implementation phase, and these will be highlighted by the M&E reports on an ongoing basis. For example, as the project involves a significant number of challenging and closely interconnected technical studies, some essential data could be generated in one study that could impact the development of subsequent analysis. To address that, the preparation of the project included a planning exercise with a detailed budget prepared according to a timeline to ensure an appropriate interconnection among the studies. The PMTF will identify suitable risk mitigation strategies; for example, regular consultation and engagement with key stakeholders in the development of each MRP component.

Another key risk is potential time constraint to finalize activities under the MRP, given the closure of PMR in 2020. To address this, the M&E reports will be used to ensure compliance with the proposed timeline, deliverables and outputs. The reports will identify appropriate strategies to mitigate the risk of lagging progress as well as other potential barriers to the PMR-supported activities.

Expected political changes in Argentina during MRP implementation, resulting from the presidential election in 2019, should not impact the development of the proposed activities under the PMR project. PMR will be framed by a structured process overseen by the NCCC, with the participation of 17 ministries, which in turn will strengthen political and technical appropriation at different levels of decision-making.
6.5 Activities, deliverables and proposed budget

Table 30. Outputs, activities and deliverables for cross-cutting activities

<table>
<thead>
<tr>
<th>Output</th>
<th>Rationale</th>
<th>Activities</th>
<th>Deliverables</th>
<th>Responsibility</th>
</tr>
</thead>
</table>
| 6.1 Project Management Task Force | To assist in the management of the PMR grant | - Prepare ToRs, shortlist consultants, monitor sub-contracted activities.  
- Coordinate regular meetings with PMR Task Group.  
- Update relevant line ministries and relevant committees.  
- Coordinate capacity building, outreach and dissemination activities.  
- Produce reports to track progress based on the proposed timeline, deliverables and outputs.  
- Identify risk-mitigation strategies as needed | TORs for activities.  
Meetings with PMR Task Group, Executive Coordinator, NCCC and other key stakeholders.  
M&E quarterly reports with action points. | PMTF |
| 6.2 Consultation, communication and outreach | To ensure that all stakeholders are informed about the decision-making process and ensure buy-in on all activities under the MRP. | - Develop a comprehensive and coordinated communication strategy.  
- Develop communication documents tailored for key stakeholders.  
- Organize two public capacity building workshops with key stakeholders on carbon pricing  
- Support the organization of the proposed workshops under each MRP component | Communication strategy.  
Two public outreach/capacity building workshops.  
Presentation sessions at NCCC roundtables.  
Support training workshops according to MRP’s components and building blocks. | PMTF |

Table 31. Timeline for cross-cutting activities

<table>
<thead>
<tr>
<th>Output</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q3</td>
<td>Q4</td>
<td>Q1</td>
<td>Q2</td>
</tr>
<tr>
<td>6.1 Project Management Task Force</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.2 Consultation, communication and outreach</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note that the budget assumes that these cross-cutting activities would start in the third quarter of 2018, while the other components of the MRP would start in the fourth quarter.
Table 32. Budget for cross-cutting activities

<table>
<thead>
<tr>
<th>Output</th>
<th>Estimated support from PMR (USD)</th>
<th>Funding source (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2018 (6 mo)</td>
<td>2019 (12 mo)</td>
</tr>
<tr>
<td>6.1 Project Management Task Force</td>
<td>74,525</td>
<td>149,050</td>
</tr>
<tr>
<td>6.2 Consultation, communication and outreach</td>
<td>8,600</td>
<td>17,200</td>
</tr>
<tr>
<td>Total</td>
<td>83,125</td>
<td>166,250</td>
</tr>
</tbody>
</table>
7 Summary of activities, timeline and budget (Building Block 6)

This section provides a summary of the estimated timeline and budget for key activities that will be undertaken in Argentina’s MRP.

Table 33. Overview of outputs and activities

<table>
<thead>
<tr>
<th>Output</th>
<th>Activities/description</th>
<th>Deliverables</th>
<th>Responsibility</th>
</tr>
</thead>
</table>
| 2.1 Modelling and analysis to support decision on RECs as a CPI | - Screen modelling tools, identify data needs, map barriers to RE and create high-level scenarios for RECs (e.g. scope, expansion of RE targets, type of obligation, compliance options, etc.).  
   - Model potential demand and market size under different REC scenarios, as well as potential impacts on energy prices, energy consumption, transmission and distribution requirements, socio-economic (micro and macro) impacts and emissions.  
   - Assess interaction of RECs with other policy instrument including carbon tax.  
   - Facilitate engagement and workshop with government and key stakeholders to discuss recommendations on RECs.                                                                                                                                                                                                 | REC scheme pre-feasibility study for Argentina.                                                                 | Task Group Key Actor: Under-secretary of RE                                                                 |
| 2.2 Definition of scope and target for REC scheme | - Analyze renewable electricity supply curve (i.e. generation potential and costs by technology) to estimate costs of different REC scheme targets.  
   - Analyze the rationale for scope, coverage and target for the scheme based key quantitative and qualitative considerations (e.g. micro- and macroeconomic costs, grid impacts, voluntary market links, interaction other RE policies).  
   - Facilitate stakeholder engagement and government decision on REC scheme scope, coverage and target.                                                                                                                                                                                                         | Formal decision on scope and target for REC scheme.                                                                 | Task Group Key Actor: Under-secretary of RE                                                                 |
| 2.3 Design of overall REC scheme | - Develop and implement data collection system for larger user energy consumption (i.e. potential obligated entities) and RE production (current and planned).  
   - Develop relevant templates, guidelines and tools to support MRV for RE generation and for compliance with targets, including verification requirements and guidelines.  
   - Analyze options for compliance flexibility, price controls and the potential for revenue recycling (i.e. form penalties).  
   - Develop a plan for institutional, regulatory and capacity development.  
| 2.4 Design a pilot phase for | - Define detailed scope of work for institutional structures, including any new                                                                                                                                                                                                                                                                                      | Proposed institutional                                                                                   | Task Group Key Actor: Under-secretary of RE                                                                 |
### Output

### Activities/description

- REC scheme entities needed, and start implementation of capacity building plan.
- Support preparation of regulatory framework
- Prepare a plan for rolling out the technical infrastructure.
- Propose the goals and a plan to put in place MRV systems for a defined group of actors for 1-2-year pilot (possibly without compliance penalties)

### Deliverables

- and regulatory framework
- Capacity building workshops
- Proposed technical infrastructure/registry, and MRV system

### Responsibility

- Actor: Under-secretary of RE

<table>
<thead>
<tr>
<th>Output</th>
<th>Activities/description</th>
<th>Deliverables</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>REC scheme</td>
<td>entities needed, and start implementation of capacity building plan.</td>
<td>and regulatory framework</td>
<td>Actor: Under-secretary of RE</td>
</tr>
<tr>
<td></td>
<td>- Support preparation of regulatory framework</td>
<td>Capacity building workshops</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Propose the goals and a plan to put in place MRV systems for a defined group of actors for 1-2-year pilot (possibly without compliance penalties)</td>
<td>Proposed technical infrastructure/registry, and MRV system</td>
<td></td>
</tr>
</tbody>
</table>

| 3.1 Modelling and analysis to support decision on EECs as a CPI | Screen modelling tools, identify specific data needs and barriers to EEC scheme and create high-level scenarios for EECs (e.g. scope, EE targets, type of obligation, compliance options, etc.) | EEC scheme pre-feasibility study for Argentina | Task Group Key Actor: Under-secretary of EE |
|  | - Model potential demand and market size under different EECs scenarios, as well as potential impacts on energy prices, energy consumption, socio-economic (micro and macro) impacts and emissions. | | |
|  | - Assess interaction of EECs with other policy instruments, including carbon tax. | | |
|  | - Facilitate engagement and workshop with government and key stakeholders to discuss recommendations on EECs. | | |

| 3.2 Definition of scope and target for EEC scheme | Update/analyze EE cost curve, building on outputs of National Useful Energy Balance project, to estimate costs of different EEC scheme targets. | Formal decision on scope and target for EEC scheme | Task Group Key Actor: Under-secretary of EE |
|  | - Analyze the rationale for scope, coverage and targets for the scheme, based on key quantitative and qualitative considerations (e.g. potential new legislation, micro- and macro-economic costs, voluntary market links, interaction with other EE policies). | | |
|  | - Facilitate stakeholder engagement and government decision on EEC scheme scope, coverage, and target. | | |

| 3.3 Design of overall EEC scheme | Develop and implement data collection system for obligated entities under the EEC scheme, building on existing data collection systems. | EEC design study for Argentina | Task Group Key Actor: Under-secretary of EE |
|  | - Develop relevant templates, guidelines and tools to support MRV for the EEC scheme, including verification requirements and guidelines. | | |
|  | - Analyze possible flexibility mechanisms, compliance options, uses of penalty revenue and implications of voluntary entity participation. | | |
|  | - Develop a plan for institutional, regulatory and capacity development. | | |
|  | - Design registry system, including functional specifications, options for procurement, interface needed with other systems, and financing options. | | |

<p>| 3.4 Design a pilot phase for | Define of scope of work for institutional structures, including any new entities | Proposed institutional | Task Group Key |</p>
<table>
<thead>
<tr>
<th>Output</th>
<th>Activities/description</th>
<th>Deliverables</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>EEC scheme</td>
<td>needed, and start implementation of capacity building plan. - Support preparation of regulatory framework. - Prepare a plan for rolling out the technical infrastructure. - Propose the goals and a plan to put in place MRV systems for a defined group of actors for 1–2-year pilot</td>
<td>and regulatory framework Capacity building workshops Proposed technical infrastructure/registry, and MRV system</td>
<td>Actor: Under-secretary of EE</td>
</tr>
<tr>
<td>4.1 Analysis of impacts of the existing carbon tax</td>
<td>- Model the potential impact of the carbon tax on energy prices, consumption, emissions, economic outputs and the distribution of income - Assess the risks of ‘stranded assets’ in fossil fuel energy production and consumption - Capacity building workshop on assessing carbon tax impacts</td>
<td>Argentina carbon tax impact study</td>
<td>Task Group Key actor: Ministry of Treasury</td>
</tr>
<tr>
<td>4.2 Analysis of extensions to carbon tax program</td>
<td>- Compare carbon tax to ETS - Compare the cost and abatement potential of the current different mitigation policies and instruments - Assess the use of carbon taxes to replace current distortionary taxes - Model options for expanding carbon tax coverage - Develop a MRV process for ex-post assessment of impact of carbon tax. - Assess the need for border tax adjustments in the long term - Capacity building workshop on analysis of carbon tax extensions</td>
<td>Argentina carbon tax extension study</td>
<td>Task Group Key actor: Ministry of Treasury</td>
</tr>
<tr>
<td>5.1 Analysis and prioritization of CPIs for transport</td>
<td>- Review options for mitigation of GHG emissions and assess impact of a carbon price. - Analyze and rank possible CPIs using criteria agreed with stakeholders. - Prepare pre-feasibility which would include review needs for further development and implementation of chosen CPI(s). - Analyze and track development of CORSIA system as a possible source of demand for emission reduction units or credits from the Argentina, particularly from the transport sector. - Consult stakeholders throughout with focus on agreeing evaluation criteria, action plans and reaching final agreement on development of options.</td>
<td>CPIs for Argentina’s transport sector study</td>
<td>Task Group Key actor: Ministry of Transport</td>
</tr>
<tr>
<td>6.1 Project Management Task Force</td>
<td>- Prepare ToRs, shortlist consultants, monitor sub-contracted activities. - Coordinate regular meetings with PMR Task Group. - Update relevant line ministries and relevant committees. - Coordinate capacity building, outreach and dissemination activities.</td>
<td>TORs for activities Meetings with PMR Task Group, Executive Coordinator, NCCC</td>
<td>PMTF</td>
</tr>
</tbody>
</table>
### Output 

<table>
<thead>
<tr>
<th>Activities/description</th>
<th>Deliverables</th>
<th>Responsibility</th>
</tr>
</thead>
</table>
| - Produce reports to track progress based on the proposed timeline, deliverables and outputs.  
  - Identify risk-mitigation strategies as needed                                      | and other key stakeholders M&E quarterly reports with action points.         |                |
| 6.2 Consultation, communication and outreach                                            | - Develop a comprehensive and coordinated communication strategy.             | Communication strategy. Two public outreach/capacity building workshops. Presentation sessions at NCCC roundtables. Support training workshops | PMTF           |
|                                                                                       | - Develop communication documents tailored for key stakeholders.             |                |
|                                                                                       | - Organize two public capacity building workshops with key stakeholders on carbon pricing |                |
|                                                                                       | - Support the organization of the proposed workshops under each MRP component |                |

### Table 34. Summary of outputs and timeline

<table>
<thead>
<tr>
<th>Output</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Q3</td>
<td>Q4</td>
<td>Q1</td>
</tr>
<tr>
<td>2.1 Modelling and analysis to support decision on RECs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2 Definition of scope and target for REC scheme</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.3 Design of overall REC scheme</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.4 Design a pilot phase for REC scheme</td>
<td></td>
<td></td>
<td></td>
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<td>3.1 Modelling and analysis to support decision on EECs</td>
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<td>3.2 Definition of scope and target for EEC scheme</td>
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<td>3.3 Design of overall EEC scheme</td>
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<td>3.4 Design a pilot phase for EEC scheme</td>
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<td>4.1 Analysis of impacts of the existing carbon tax</td>
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<td>4.2 Analysis of extensions to carbon tax program</td>
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<td>5.1 Analysis and prioritization of CPIs for transport</td>
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<td>6.1 Project Management Task Force</td>
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### Table 35. Summary of budget

<table>
<thead>
<tr>
<th>Outputs</th>
<th>Estimated support from PMR (USD)</th>
<th>Funding source (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2018 (6 mo)</td>
<td>2019 (12 mo)</td>
</tr>
<tr>
<td>RECs</td>
<td>70,000</td>
<td>547,500</td>
</tr>
<tr>
<td>EECs</td>
<td>77,500</td>
<td>600,000</td>
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<tr>
<td>Carbon Tax</td>
<td>212,500</td>
<td>637,500</td>
</tr>
<tr>
<td>Transport</td>
<td>51,667</td>
<td>103,333</td>
</tr>
<tr>
<td>Cross-cutting</td>
<td>83,125</td>
<td>166,250</td>
</tr>
<tr>
<td>Total</td>
<td>494,792</td>
<td>2,054,583</td>
</tr>
</tbody>
</table>
8 References


———. 2017d. “Segundo Informe Bienal de Actualización de La República Argentina a La Convención Marco de Las Naciones Unidas Sobre El Cambio Climático.”


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Annex A. International experience with renewable energy certificates

8.1 Introduction to Renewable Energy Certificate schemes

The intermittent nature of wind, solar and some other renewable resources means that these sources are not dispatchable and may be more expensive than baseload fossil fuel-based electricity. These characteristics also present higher risks for potential investors. Public sector policy interventions have, therefore, been critical for promoting many RE technologies. There is extensive international experience in the use of different types of policies that seek to spur investment in the renewable field, including production tax credits, rebates, loan programs, subsidies, and implicit carbon-pricing schemes. All these instruments have advantages and limitations, depending greatly on the regulation, development and circumstances of each country.

Subsidy is an example of an instrument used widely, one which can be directed into either RE capacity or RE output. Applied to installed capacity, subsidies can stimulate supply but not demand for renewable electricity and can be distributed unfairly. Meanwhile, subsidies on output (e.g. a premium tariff) have been granted, seeking a successful deployment of RE; nonetheless, there is not a strong incentive for investors to drive down cost by improvement of operation and efficiency (Schaeffer, G.J. and Martens, J.W. 1999).

In the European Union, the increase in solar PV installations has been achieved to a big extent thanks to feed-in tariffs, which help to provide a stable source of income for RE projects, thus lowering the project risks. In some cases, these tariffs were not adjusted swiftly enough to reflect the actual costs of solar PV, which were falling fast as the technology gained maturity, thereby leading to a huge investment in solar PV installations. In contrast, China is steering its policy from a feed-in tariffs program to a more flexible system using a REC scheme, along with a power market reform, new transmission lines and the expansion of distributed generation. This strategy intends to reduce the exposure that RE projects face to reduced wholesale prices when the demand is low and RE production is available and more abundant (IEA 2017b).

A REC scheme, also known as Renewables Obligation scheme, quota model, or green certificates scheme, is an implicit carbon-pricing scheme where the electricity retailers or large consumers must achieve or surpass the electricity generation threshold from RE sources stated by the government. In general, such a threshold can be met by delivering the corresponding amount of certificates or by paying a penalty that will depend on the level of non-compliance of the obligated entity (Schaeffer, G.J. and Martens, J.W. 1999).

In other words, RECs constitute a market-based policy instrument that seeks to promote an increase in installed capacity for RE generation and, implicitly, to reduce GHG emissions from the power sector. As a market-based instrument, they have the potential to support the country in achieving RE goals in the most cost-efficient manner. In general terms, the REC scheme can be used as an instrument to help entities obligated by the regulatory framework of the country to demonstrate they have met their RE quotas for compliance, or that they have voluntarily supported RE. RECs in the voluntary market are a tracking system that allows organizations to demonstrate their commitment towards sustainability or to create new products or services that are less carbon-intensive. This first section presents relevant international experience with REC schemes, as an introduction to identifying the key issues that Argentina must address in designing such a scheme.
As with any other policy instrument, the advantages and disadvantages of the REC scheme could be turned around, depending on the design choices. For instance, if the compliance target is set too low, there will be a surplus of certificates and consequently the price will drop to a level that no longer represents an incentive for new RE installed capacity, transforming the cost-efficiency advantage of the scheme into a disadvantage. Conversely, a REC scheme can promote innovation, research and development in new RE alternatives if a differentiation per type of technology is featured in the scheme, thus granting a higher incentive to higher risk energy sources, turning a disadvantage into an advantage. While a REC scheme might not necessarily create direct revenue for government (i.e. which could be used to incentivize low carbon technologies) in the way that a carbon tax would, this also depends on the design and how actors respond. Penalties collected for non-compliance, for example, could be used in similar way to tax revenue. Revenue and pricing impacts are explored under MRP activities in both this chapter and the following ones on detailed instrument design.\(^{39}\)

One of the most interesting aspects to keep in mind while designing a REC scheme is the possibility of opening the scheme to a voluntary market. Such consideration entails that, in addition to obligated entities, other voluntary participants are also entitled to use the certificates. Schemes have tackled this option differently, some allowing the same instrument to be used for both ends, others deciding to create a brand-new type of certificate to serve as proof that the origin of each electricity unit is a renewable source. The introduction of a voluntary demand can produce the following effects:

- Opening new opportunities for local customers seeking to minimize the negative environmental externalities linked to their electricity consumption.
- Enabling electricity consumers to have access to renewable electricity even in those locations where there are a limited number of generation technology options.
- Allowing end-consumers (e.g. global corporations) to claim the use of renewable electricity.

On the other hand, one important caveat is that, for the sake of preserving the integrity of the certificates, measures must be taken to assure the RE attributes of one certificate are not accounted twice; that is, a certificate used in for compliance purposes cannot be used by a voluntary participant and vice versa.

## 8.2 International experience with REC schemes

### 8.2.1 United Kingdom

The United Kingdom’s is a good example of a scheme that splits the compliance market from the voluntary market by using two different types of certificates. Since 2002, the UK has used Renewable Obligation Certificates (ROCs), which ensure that obligated entities with a Renewable Obligation (RO) create an additional long-term cash-inflow for producers of renewable electricity, which consequently incentivizes new RE installed capacity. The objective of the scheme was to get an increasing participation of RE sources in the national electricity matrix. Under this scheme, a ROC serves as a proof that a certain amount of electricity has been generated from a renewable source, providing RE generators with two sources of income, one from the sale of electricity and another from the sale of ROCs. It is important to

\(^{39}\) For example, a review of existing literature on policies for climate change mitigation (Güendulain 2017) indicates that one important issue for a fiscal policy’s positive impact is use of the revenue from a carbon tax. These funds could be used to trigger improvements in employment, product or income distribution.
note that this type of certificate (the ROC) is used by the obligated entities mainly to fulfil their RE consumption quotas. They cannot, however, simultaneously use those certificates as evidence of purchasing zero-emission electricity for purposes of their GHG footprint.

Additionally, fuel mix disclosure regulations in the European Union require all suppliers to disclose GHG emissions linked to their power supply. To comply with such regulation, European countries use Guarantees of Origin (GOs) to demonstrate where each MWh of electricity originated. Once the grid operator receives the guarantee, it removes all claimed generation from identified sources from the overall national electricity GHG emissions factor, which results in a ‘residual’ energy mix GHG emissions factor. In addition to this use, the guarantees are also of use to buyers in the ‘voluntary market’ eager to produce more environmentally friendly products or services (WRI 2015). The UK is now phasing out the use of ROCs, meaning that the RE projects covered by this instrument will continue to receive certificates up to a maximum period of 20 years. On the other hand, Contracts for Difference entered not long ago as a different instrument with the same purpose, boosting the installation of new renewable capacity in the UK.

Suppliers can fulfil their obligations either by delivering ROCs, by paying a penalty known as buyout price, or through a combination of these. Similarly, in the USA, entities can comply with their obligations by delivering an equivalent amount of RECs or by simply paying a penalty. In contrast, consumer preferences drive the voluntary market, with companies that are more conscious about the detrimental impacts of their energy purchases, preferring lower-carbon intensive energy sources. Some other drivers for the voluntary market are the fulfilment of corporate GHG emissions or sustainable development-related goals, demonstrating environmental leadership, reducing reputational risks, tackling marketing opportunities, gaining recognition among other competitors, and particularly for a fewer number of jurisdictions (e.g. the USA), taking part in federal programs like the Green Power Partnership from the Environmental Protection Agency.

Figure 40 shows how obligated entities have chosen to comply with their obligation since the start of the RO scheme, having the option of delivering ROCs, paying the ‘buy-out’ price or through a combination of these.

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40 Contracts for Difference are a reverse auction system designed to provide project investors with certainty over a low-carbon electricity generation potential investment, allowing the fixing of prices on electricity output, and as a result, reduction of risks linked to variations in energy prices.
Figure 40: ROCs delivered vs buy-out price payment in the UK’s Renewable Obligation scheme

Source: (OFGEM 2017)

To foster price stability, the UK introduced the ‘banded system’ in its RO scheme during the 2009–2013 period, enabling a differentiated production of ROCs depending on the renewable technology used to generate the electricity, thus factoring in technology-related costs and market readiness. This banded system is reviewed periodically to ensure subsidies are allocated in a cost-effective manner. Once the compliance period is over, the funds gathered from ‘buyout’ payments are redistributed among the obligated entities proportionally based on the ROCs delivered by each of them. This redistribution system plays an important role when deciding whether to buy ROCs or to pay the buyout price (Garton, G. 2016). For instance, in the 2016–2017 compliance period, the corresponding buyout price was GBP 44.77 per ROC, while an auction reached an average price of GBP 49.41 per ROC (e-POWER 2017).

8.2.2 United States of America

In the USA, the RE targets set in policies by the states, known as Renewable Portfolio Standards (RPS), require that utilities supply a specific percentage of their electricity from renewable sources (EPA 2010). Each state sets these targets independently for the utilities that they regulate, specifies the energy resources eligible in their jurisdiction, and determines how electricity service providers must comply. Additionally, the USA voluntary market allows consumers to go beyond the requirements set by policies and opens opportunities for new product development or for global initiatives from companies willing to source their electricity completely from RE sources. In fact, there are currently additional voluntary certification schemes in place created to satisfy this growing voluntary market demand, sourcing electricity originated exclusively from projects deemed to be ‘additional’ (i.e. beyond what would have occurred under existing regulations). Therefore, RECs have an important role in supplying the swiftly increasing demand within the voluntary market (EPA 2018).

To promote the generation of electricity from specific technologies, some RPS regulators decided to include specific technology quotas (known as ‘carve-outs’) and multiplying factors
(e.g. selected technologies could produce more than one certificate per MWh delivered to the grid). These instruments increase the level of complexity of the system, making the obligated entities pay especial attention to the covered technologies, but also make it more difficult for the scheme administrator to keep track of the progress made or if a surplus or deficit of certificates was likely to occur during the compliance period.

The USA’s is an example of a compliance scheme coexisting with a voluntary market through the use of a single instrument (e.g. RECs). The demand of USA RPS programs in 2015 was 214 million MWh, of which 126.5 million MWh can be attributable to demand created over the past 20 years. Equally importantly, in 2015 the voluntary demand of green power was estimated at 78 million MWh, with approximately 56% of that (44 million MWh) certified by Green-e Energy,\(^4\) demonstrating that these certificates support RE investments that are both new and additional (see Figure 41)

**Figure 41: Comparison of voluntary and compliance markets in Renewable Portfolio Standards in the USA (2006–2015)**

Finally, in the USA, there are 10 registries in place providing services each to more than one state, keeping track of the electricity generation from all sources, including fossil-fuel-based generators, which allows grid operators to know the fuel mix of the electricity fed to the grid and to calculate a realistic grid GHG emissions factor. For example, before the creation of the New York Generation Attribute Tracking System, all the RECs issuance and transactions in the RPS of New York state was kept in spreadsheets and physical documents, which in consequence resulted in the Green-e Standard (i.e. a voluntary market standard) requesting an additional auditing process to ensure no double counting of the RE generation was occurring, thus representing additional costs and resources for the participants (Jones, T. 2017).

### 8.2.3 Mexico

\(^4\) Green-e Energy is a chain of custody certification standard operating in the USA and Singapore, used to ensure that renewable energy is produced by new facilities, that it is marketed transparently and accurately, and that there is only one certificate holder.
In 2014, the Mexican electric market underwent a major restructure, with the Electricity Industry Law. The new regulatory framework brought with it new public entities, roles and policy instruments to promote RE. One of the most important changes was the clean energy quota that commenced in 2018 and was set for the wholesale electricity market participants with power consumption requirements of at least 1 MW. The Figure 42 depicts the main participants involved in the Mexican Clean Energy Certificates (CEL) scheme and their respective roles.

**Figure 42: Institutional framework of the Mexican CEL scheme**

**Acronyms:**
- SEMARNAT: Ministry of Environment and Natural Resources
- SENER: Ministry of Energy
- CRE: Energy Regulatory Commission
- CENACE: National Energy Control Center
- SCEL: System of Certificates Management and Fulfillment of Renewable Energy Obligations
- WEM: Wholesale Electricity Market

Additionally, in 2015, the Energy Transition Law was promulgated in Mexico and, as part of this law, the clean energy targets of the country were set. In line with such targets, the CEL’s quota for 2018 was set in 5%, estimated as what is required for the country to reach a 25% of clean energy generation in its electricity grid. Moreover, the quota will further increase to 5.8% in 2019 and to 13.9% in 2022 (see Figure 43).

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42 The term used is ‘clean’, to include conventional renewable energy sources (including nuclear power), but also some other sources, like efficient cogeneration and fossil fuel-based electricity production coupled with carbon capture technologies.

43 Applicable to consumers with electricity requirements equal or above 1 MW with an interconnection permit under the Electricity Industry Law and to consumers with an interconnection permit under the former law (the Electricity Public Service Law) that are not fully supplied by an eligible clean energy source.
Obligated entities can comply with the minimum RE percentage only by delivering CELs to the scheme administrator. Each CEL is equivalent to one MWh of electricity produced by technologies deemed by the law as ‘clean’. A minimum penalty set at six times the daily minimum wage of Mexico will be applied for each non-delivered CEL, which will steadily increase with further delays in meeting compliance targets, to up to 50 times the daily minimum wage; nonetheless, the penalty will not exempt the liable entities from delivering their corresponding amount of CELs to the scheme administrator.

CELs only expire when they are cancelled, and such cancellation can also happen on a voluntary basis, which opens an area of opportunity for a customer-driven voluntary market; however, CELs voluntary cancellation cannot be used to claim zero-GHG emissions for electricity consumption, which is one of the most important uses from consumers (e.g. when developing their GHG emission inventories). Additionally, obligated entities can defer their quota up to 25% and for up to two years (i.e. only meet 75% of their quota during the current compliance period and ‘borrow’ the other 25% from a surplus accumulated in the next two years), but at a 5% interest rate. Moreover, the trading alternatives for certificates in Mexico include bilateral agreements, hedge contracts and transactions through the CEL market. Once they receive CELs, eligible energy producers can sell their CELs to obligated entities. Obligated entities can also sell their excess CELs to other obligated entities who have not been able to generate or acquire RE to meet their targets.
Annex B. International experience with energy efficiency certificates

8.3 Introduction on Energy Efficiency Certificate schemes

Energy Efficiency Certificate (EEC) schemes are also known as Energy Efficiency Obligation schemes, Energy Saving Obligation Schemes, Energy Performance Certificate schemes, or White Certificates schemes. These are implicit carbon-pricing schemes used to enhance the cost-effectiveness of improvements in EE within a broad diversity of sectors and within an ample range of measures. The objective of this policy instrument is to make EE measures more accessible to different parties, for instance by providing financial resources to households that could not afford to buy more efficient equipment on their own, therefore helping them to hurdle initial investment costs. It also releases a major energy saving potential in large industrial facilities that must comply with a given energy saving target but need an incentive to cover the required capital and operational expenditures of a given project throughout its lifecycle.

EEC schemes promote energy efficiency across a variety of sectors and, implicitly, reduce GHG emissions related to those end-use sectors. As a market-based instrument, they have the potential to support the country in achieving energy-efficiency goals in the most cost-efficient manner. In general terms, the EEC scheme can be used as an instrument to help entities obligated by the regulatory framework of the country to demonstrate they have met their EE targets, either through internal reductions in consumption or by purchasing EECs. For the eligible energy-efficiency measures within an EEC scheme, some may allow for energy savings to be calculated ex-ante if the measure either does not require monitoring or its monitoring procedures are fairly simple, while for some measures there will be requirements for more detailed ex-post monitoring. Ultimately, the certificates produced by these measures should translate into the incentives needed to cover, at least partially, the investment costs for EE.

Through EEC schemes, energy savings produced by eligible projects are entitled to receive one certificate per saved unit of energy (e.g. metric ton of oil equivalent). When obligated entities (e.g. energy distributors or selected industrial facilities) achieve and surpass their targets, they can sell their excess of certificates. Meanwhile, if obligated entities fail to achieve their targets they must either purchase a number of certificates equal to their target or pay the penalty stated by the system’s administrator. Countries with experience with this type of scheme include Belgium, Denmark, France, Italy, Luxembourg, the UK, Poland and India. Once the European Union Energy Efficiency Directive was approved, more countries considered the possibility of using EEC schemes as a means to fulfil their EE targets.

8.4 International experience on EEC schemes

8.4.1 European Union

The European Union (EU) adopted the Energy Efficiency Directive (EED, Directive 2012/27/EU) which sets a binding EU-level obligation of achieving energy savings to the level of 30% across different sectors of the economy. The EEO scheme is not the only policy instrument enabled by the EED but is one of the most widespread options among EU member states, along with financing schemes, fiscal incentives, and taxes on energy and carbon. The targeted subjects include energy suppliers, retailers, and distributors, being those groups better positioned to screen and unveil energy savings potential in their own operations and their down-stream value chain (e.g. end customers) (European Commission 2016).
Specifically, Article 7 of the EED requires putting in place EEO schemes as a means for requiring energy suppliers and distributors to implement energy-saving measures to achieve energy reductions at a rate of 1.5% of their yearly energy sales to end-users for the 2014–2020 period. The EEO schemes represent the main tool for France and Italy in achieving their 2020 savings targets. In the UK, the EEO scheme is responsible for 10% of the savings objective (Beucler, I. 2016) (Figure 44).

**Figure 44: Energy Efficiency Obligation schemes to achieve energy efficiency targets by 2020**

Some of the countries with experience in the design of EEO schemes within the EU are Austria, Belgium, Bulgaria, Denmark, France, Hungry, Ireland, Italy, Latvia, Lithuania, Malta, the UK, Slovakia, Slovenia, Spain and Poland. To foster energy utilities and help them achieve these savings the EED strongly advises the implementation of EEO schemes. Analysis of the reports from EU member states indicate that sixteen countries have chosen to implement an EEO scheme as a tool to achieve their EE targets. Of these, eight already had an EEO scheme before the EED, while the other eight took their decision subsequently.

There are some price signals available that serve as a reference of the cost-efficiency achieved through the implementation of EEC schemes. For instance, in France it represented an additional cost of EUR 0.4 cents per kWh, while for Denmark, Italy and the UK, the add-on prices were EUR 0.45 c/kWh, EUR 1.7 c/kWh and EUR 0.7 c/kWh, respectively. Given that the price of energy is much higher in comparison to the price added by the cost of certificates, the EEC schemes are highly cost-efficient. Once more, an important factor behind producing a low impact on the final energy prices is the selection of measures: if the scheme focuses primarily on low-cost technologies the impact on price can be limited and vice versa (EPRS 2016).

### 8.4.2 Italy

In 2004, Italy launched its own EEC scheme as part of the laws related to the national electricity and gas market liberalization that requested a policy measure for Distributed System Operators (DSOs), companies with more than 50,000 end-users, to implement EE projects. In this scheme, DSOs must present the number of certificates (equal to one ton of oil equivalent of energy savings) that correspond to their targets of the previous year on every May 31st.
Certificates can be produced by implementing EE projects either in the own assets of the DSO or in end-user assets.

Italy has one of the world’s most mature schemes, with electricity and natural gas distributors as obligated parties. Initially, this scheme targeted the residential sector, focusing mostly on small and scalable actions producing electricity savings (e.g. lighting). With time, the scheme broadened its scope to include residential heating. In 2013, the Thermal Energy Account scheme replaced the EEC scheme as the incentive for small-scale EE measures in the private sector and public administration (e.g. for the replacement of electric water-heaters by heat-pump water-heaters) (EPRS 2016).

Almost all projects are eligible under the Italian EEC scheme, except for the ones focused on efficiency in electricity generation, as long as their savings are additional to the market average or mandatory standard. Additionally, one of the most recent changes of the Italian EEC scheme is the targeting of the industrial sector and large gas and electricity consumers. Moreover, energy service companies now have to be certified to take part in the scheme as voluntary participants, which narrows the number of companies in the scheme to large ones able to do things that smaller ones find difficult to achieve, e.g. financing projects. One of the major differences between the initially included residential measures and the ones comprised in the industrial sector is that the assumptions on the stability in the energy savings throughout the life of the measure for the first sector do not hold for the latest. Also, economic cycles of the country impact the definition of the BAU scenario as well as the savings achieved after the measure is implemented. All these changes are part of the evolution and maturity of the scheme, which is expected to cover 60% of the target of energy savings of the country (EPRS 2016).

In early-2017, there were three different energy saving calculation methods:

1) Deemed saving projects (e.g. lamps, boilers or engines), where results were directly obtained by multiplying pre-stated factors by the number of equipment units installed;
2) Simplified monitored projects (e.g. for district heating or public lighting), where the results depended on the measurement of some parameters; and,
3) Monitoring plan projects, in which case-by-case methodologies and baselines had to be developed by the project owner and later approved. The information of all the projects has to be submitted through a web-based platform.

Later the same year, the first two methods mentioned above were merged into one single ‘standard projects’ category, whereas the third method was slightly changed to increase the level of stringency for the definition of the baseline (EPATEE 2017).

In 2011, a multiplying factor was introduced in the Italian scheme, better known as a ‘tau coefficient’. The purpose of this coefficient was to anticipate savings expected throughout the technical lifetime of a measure (e.g. 15 years) within the first five-year period to support projects in early development stages and to provide additional liquidity to the market (Di Santo et al. 2014). The value of this coefficient depends of the measure and it is due to this multiplier that the number of certificates does not match the number of actual energy savings, as can be seen in Figure 45.
In 2017, the regulation of the scheme changed once more to extent the recognition period for measures implemented and to remove the multiplying factor.

The exchange of certificates within the Italian EEC scheme occur either through a platform administered by the Energy Markets Manager (GME, entity owned by the GSE) or by means of bilateral agreements. Because of a shortfall of certificates in 2017, the price exceeded EUR 300 per certificate which is much higher than the price range of EUR 90–110 it had for over five years. The expenses of obligated entities are recovered later through the energy tariff (e.g. electric and natural gas bills), which is paid by several end-users. Nonetheless, the costs per electricity saving did not surpass EUR 1.7 c during the 2005–2011 period (EPATEE 2017).

In addition to distribution system operators, voluntary participants can also produce certificates resulting from the implementation of EE projects in Italy. Voluntary participants are allowed in this scheme, including companies and public administrations with an energy manager or with an ISO 50001 energy management system, energy service companies, other Distributed System Operators with fewer than 50,000 users, and companies controlled or linked to obligated DSOs.

Some features that give flexibility to the obligated entities are the possibility of retaining certificates for its use or trading in future years and the option to trade certificates in the spot market and through bilateral contracts. The Italian scheme showcases how this instrument can work across all sectors and all technologies, covering around 60% of the 2020 country’s EE target. It also demonstrates how a set of standardized saving projects (not requiring metering systems) is important in the introductory phase of the scheme, whereas more structured (and complex) projects become fundamental as the stringency of the targets rises with time (ENSPOL 2015).

8.4.3 France

In 2005, France adopted its own EEC scheme to reduce final energy consumption mainly in the residential, commercial and public buildings sectors. It also includes other activities like light industry, agriculture and transport. The obligated entities are energy suppliers selling energy above pre-stated thresholds. Thresholds vary depending on the type of energy being sold; for
example, suppliers of electricity, natural gas, heating and cooling are considered obligated entities if they surpass 400 GWh per year. There are other thresholds for liquefied petroleum gas, heating oil and automotive fuel.

Around 80% of the obligation was imposed on the state-owned electricity company Electricité de France and Gas de France. Meanwhile the remaining 20% of the obligation falls on small fuel retailers (e.g. 2,500 heating oil retailers that deliver 13% of the target of the country) (Lees, E. 2014). Also, for this scheme, the obligation must be fulfilled within three-year periods.

For the French EEC scheme, measures can be fitted in two large groups:

- ‘Standard operations’, including those measures for which energy savings can be calculated without direct measurement requirements and only by applying predetermined calculation formulas (e.g. wall and window insulation or individual low-temperature boilers); and,

- ‘Special operations’, which entail non-standardized operations that require additional procedures to accredit for achieved energy savings (e.g. non-standard measures within industrial facilities).

Like in the rest of the European energy saving certification schemes, a basic requirement for all the eligible measures is ‘additionality’. Moreover, the French EEC scheme opens the possibility for obligated entities to look at and take advantage of energy-saving opportunities within any sector and by reducing any energy type; that is, obligated sectors are not only limited to end-consumers from their own sectors (Lees, E. 2014).

To meet their targets, obligated entities can implement energy saving measures in their own facilities, provide incentives to end-users to implement energy saving measures, provide financial resources to EE awareness-raising programs or other programs oriented to reduce energy poverty, or purchase energy-saving certificates in the open market.

The trading process is the backbone of this type of policy instrument, enabling exchanges between different participants. For France, trading is allowed via a national online registry named ‘Emmy’, which is a public service, and banking certificates is allowed up to two compliance periods counting from the one they were generated in.

### 8.4.4 India

The 2008 Indian National Action Plan on Climate Change is a policy framework to achieve national growth objectives along with climate change mitigation and adaptation targets. In terms of energy efficiency, it includes the National Mission for Enhanced Energy Efficiency. One component of this is the Perform, Achieve, and Trade (PAT) scheme, which is an implicit carbon pricing scheme designed to enhance the cost-effectiveness of improvements in EE in energy-intensive industries and large facilities through tradable certificates. Figure 46 shows the overall structure of the scheme, as well as how the different institutions exchange information and financial resources.
The PAT seeks to contribute to the national targets of a 20–25% reduction in carbon intensity relative to 2005 levels by 2020. Under this scheme, obligated entities are known as Designated Consumers (DCs) and compliance periods last three years. For DCs to meet their targets, they must submit a report on energy consumption to the State Designated Agency and to the Bureau of Energy Efficiency (BEE), establish an energy manager responsible for submitting annual energy consumption returns, and either purchase certificates (known as ESCerts within this scheme and equivalent to 1 mtoe) to make up for any gap in meeting their compliance obligations or sell ESCerts surplus in the market. If a DC does not deliver the corresponding number of ESCerts to making up for its gap, it will be liable for a maximum fine of INR 1,000,000 (approximately USD 15,552) plus an additional fine per non-delivered certificate. Figure 47 illustrates how the PAT scheme has evolved over time.
The energy savings target is individualized in India for obligated actors. For a DC to calculate its specific energy consumption, a gate-to-gate concept is used, consisting in the division of the sum of all the forms of energy utilized in the facility by the total quantity of product leaving the production process of the site (Figure 48).

Figure 49 shows the situation of two facilities, facility A performing better than the target set, thus generating ESCerts that it can sell, and facility B underperforming, which obligates it to cover its ESCerts shortfall by purchasing certificates.
Additionally, the Central Electricity Regulatory Commission is the market regulator for India, enabling the trading of certificates. Meanwhile, the power exchanges IEX and PXIL are the platforms where trading occurs. Finally, the Power System Operation Corporation is the registry administrator and the entity in charge of making designated consumers eligible for trading certificates and for keeping record on transactions.
Annex C. International experience with transport sector carbon pricing instruments

Relevant analysis for selecting market instruments for the transport sector has already been carried out for a number of PMR partner countries (World Bank 2014) (Grütter and Cocco 2013). The overview of market instruments for the transport sector presented below is based on this work but has been amended to reflect the perceived priorities of relevant stakeholders in Argentina. Six relevant market instruments for the transport sector are presented below.44

8.5 Carbon tax

Carbon taxes on energy and/or fuel have been introduced in a number of countries since the 1990s. Finland introduced a carbon tax in 1990, initially applied to heat and electricity production and later expanded to cover transportation and heating fuels. Both Norway and Sweden introduced carbon taxes in 1991. Revenues from application of a carbon tax can be subsumed with other tax revenues or earmarked for specific (i.e. low-carbon) initiatives and actions. A carbon tax on fuels has the advantage of being relatively simple to apply and flexible in the use of revenues (i.e. mixed with other tax revenues or earmarked for specific purposes). The effectiveness of a carbon tax in reducing emissions of GHGs from the transport sector is, however, a matter of debate. Some analysts claim that it may not lead to high GHG reductions mainly because of the low price elasticity of fuels (Grütter and Cocco 2013), whereas others conclude that a carbon tax can be successful in significantly reducing emissions of CO₂ (Andersson 2017).

Box 2: Sweden’s carbon tax

Sweden introduced a carbon tax in 1991, one of the first countries to do so. It was first introduced at the level of USD 30 per ton of CO₂, and the tax has now risen to close to USD 140 per ton of CO₂ (2018 price using current conversion rate). The final tax rates applied to fossil fuels are set in accordance with their carbon content, as CO₂ emissions released in burning any fossil fuel are proportional to the carbon content of the fuel. The carbon tax is in addition to energy tax and VAT, and revenues from carbon tax comprised 1.75% of total government revenues in 2006 (all taxed sectors). The carbon tax is not earmarked for any specific purpose when entering the governmental budget. It should be noted, however, that general budget funds may be used for specific purposes linked to the carbon tax, such as addressing undesirable distributional consequences of taxation or financing other climate-related measures.

Sources: World Bank 2014; Government Offices of Sweden

8.6 ETS including transport sector

Including downstream land-based transport (e.g. emissions from vehicles) within an ETS is not considered feasible due to the very large number of small sources. It is possible, however, to include transport in an ETS based on an upstream approach, meaning that businesses such as importers, refineries and/or fuel distributors would be covered by the ETS as opposed to individual vehicle users. Jurisdictions (i.e not only countries) that have done this include

44 Note that NAMAs were included in the original paper, but because NAMAs are only a CPI if they include crediting, this has been incorporated into the heading for international crediting.
California, the Western Climate Initiative and New Zealand. Including upstream transport emissions in an ETS is relatively straightforward, with allowances being attributed to fuel distributors and suppliers. This option will only be valid if Argentina adopts an ETS which covers a number of economic sectors (e.g. energy and industry) and which can therefore be expanded to include transport. In other words, this is not a stand-alone option applicable only to the transport sector. The advantages of this option are therefore the same as those of an ETS for any sector. This option is, however, considered to have limited impact on transport emissions as the target entities (i.e. fuel distributors and suppliers) have little control over fuel use and the adoption of energy-efficient practices. As for the carbon tax, the low price elasticity of fuel may also limit the impact of this option.

**Box 3: California – including transport in the ETS**

The transport sector is the largest contributor of both GHGs and “criteria air pollutants” in California. The Cap-and-Trade Regulation in California took effect on 1 January 2012 and was expanded in 2015 to include fuel distributors to address emissions from transport. Compliance instruments include allowances and offset credits (project- or sector-based), although offset credits cannot derive from the transport sector as this is a capped sector, and also not from projects outside California if these are from a capped sector as defined in the California ETS. The program is designed with floor and ceiling prices of USD 10 and USD 70 per ton of carbon through to 2020. Even at USD 70/tC, however, the impact on gasoline prices is considered low – around USD 0.6 increase per gallon of gasoline.

Sources: Grütter, Jurg

### 8.7 Domestic offset scheme

In an offset scheme, project- or program-based emission reductions are quantified and can be sold to entities that are required to reduce their emissions below a set target, and are allowed to achieve this target, at least partially, through the purchase of offsets from third parties. The demand for offsets, and therefore the finance to purchase these, results from the setting up of an ETS, carbon tax or some form of emissions target scheme. The most obvious example of an (international) offset scheme involves entities covered by the EU-ETS that are buying CDM offsets. In a domestic offset scheme, entities covered by an ETS can buy emissions reduction certificates from activities and installations that are not covered by the ETS. Therefore, if transport activities are not covered by the ETS (as is usually the case), emissions reductions from projects in the transport sector (e.g. development of a bus rapid transit system) can become a source of revenue for the project. The success of an offset scheme depends on ensuring a stable funding source and requires strong technical/managerial efforts and resources to ensure monitoring and reporting of emission reductions are both accurate and transparent.

### 8.8 Domestic compensation scheme

Although a domestic compensation scheme can be considered as a sub-set of offset schemes (World Bank 2014), for the purposes of this review it is presented as a separate instrument due to the nature and source of funding. In a domestic compensation scheme, the national government pays entities for implementing GHG mitigation projects. The finance itself may come from general government revenue sources (i.e. not be tied to a special income or levy) but may also originate from a carbon tax or auctioning of ETS allowances. The GHG emission impact of such a scheme on sustainable transport can be quite significant, and finance from government is expected to be stable. If the finance comes from general government revenue
sources, however, it will compete with other government expenditure and may therefore be at risk in times of economic hardship or changes in government priorities.

**Box 4: Switzerland – example of a domestic offset scheme**

Switzerland introduced its offset scheme for transport fuels in 2013, which allows purchase of domestic emission reduction credits. Importers of fossil motor fuels are required to compensate for their CO₂ emissions, either by undertaking their own projects or by acquiring offsets (called “attestations” under the scheme). The percentage compensation has risen steadily from the year 2014/15 (2%) and will reach a maximum of 10% by 2020. Domestic offset projects can be from capped sectors which over-achieve their target or offset projects from non-capped sectors. Like international projects, compensation projects and programs in Switzerland must follow a specific procedure and, in particular, demonstrate that the reductions are additional (as for the CDM).

Eligible projects include energy efficiency, renewable energy, mobility management, wood products and biofuels with high quality standards. Projects that reduce emissions of methane, nitrous oxide or fluorinated gases are also eligible. Projects in the fields of nuclear energy, forestry, CO₂ storage and conversion from petrol- or diesel- to natural gas-driven vehicles (with the exception of vehicle fleets) are not permitted. Projects already under other GHG regulations (e.g. passenger car efficiency measures) are not permitted as there is a binding CO₂ per km target.

Projects approved during the first stage of the scheme included ten biofuel projects, car-sharing, car-pooling, eco-drive (efficient driving), aerodynamic measures on trucks and rail freight corridors.

Sources: Grütter, Jurg; Swiss Federal Office for the Environment (FOEN)

8.9 International crediting/offset scheme

Operational and proposed international crediting schemes include the instruments and mechanisms such as, inter alia, the CDM, new mechanisms under the Paris Agreement, the International Civil Aviation Organization’s CORSIA scheme (described in more detail in section 5.1.3) and, in principle, credited Nationally Appropriate Mitigation Actions (NAMAs). It should be noted, however, that apart from the CDM, which is well established, there has so far been little or no practical experience in transactions using many of these mechanisms. In all these examples revenue would flow from international governments or companies to projects and programs which lead to emission reductions and are certified under a recognized standard.

To date, a total of 46 Argentinean CDM projects have been registered with the UNFCCC, none of which are in the transport sector, a lack that illustrates that transport is not perfectly suited to crediting/offset schemes. This is mainly due to their complexity, which leads to monitoring challenges and high transaction costs, and their high investment cost, which will not be significantly impacted by carbon finance. There are currently no examples of crediting NAMAs, and the rules for crediting under the Paris Agreement are still under development. Both mechanisms would require the sale of emission reductions in the global carbon market, and therefore MRV requirements would be expected to be stringent and similar to those of the CDM. This may lead to the same monitoring challenges and resultant high transaction costs.

8.10 Performance standard with permit trading

Performance standards are usually established as a command and control instrument, where governments impose emissions standards (e.g. tCO₂ emitted per km) on manufacturers or
distributors. Performance standards may, however, be established with a ‘fee-bate’ system or designed comparable to an ETS. Under this model, the performance standard for a new passenger car can be considered the allowance set for each car (see Figure 50 and Figure 51). For example, car importers and producers get allowances (e.g. 150 gCO₂/km) for each car sold. If they sell cars with lower emissions, they have surplus allowances, which they can sell to other producers/importers that sell vehicles with emissions above this allowance level. A finance flow from distributors of cars with high emissions towards distributors of cars with low emissions is therefore created similar to that in an ETS. There is, however, currently limited international experience with this form of CPI.

Figure 50: Illustration of a performance standard with permit trading – based on low-emission vehicle share of total fleet

Figure 51: Illustration of a performance standard with permit trading – based on fleet average emissions