

Update on PMR Upstream Analytical Work to Support Development of Policy Options for Mid- and Long-term Mitigation Objectives

I. BACKGROUND

1. The PA, through [Resolution No. PA9/2014-3](#) allocated an envelope of US\$5 million for FY15 to support the following activities: (1) Country-level analytical work; (2) Common methodology and framework (including modeling); and (3) International and national technical meetings and workshops. The PA also noted a need to prioritize carbon markets and other carbon pricing instrument in such analytical work, and also requested that the Secretariat informs the PA, prior to each resource allocation, on the scope and timelines of the analytical studies and resource allocation. In addition, the PA requested the Secretariat to inform the PA, prior to each resource allocation, on the scope and timelines of the analytical studies and resource allocation. Finally, the PA invited the Implementing Countries to share the progress and outcomes of the upstream policy analytical work with the Assembly, while respecting confidentiality of the information that may be identified by the participating country.
2. The upstream analytical work consists of two streams of support: A. Additional and targeted support to countries to pursue design and implementation of carbon pricing instruments (e.g. carbon tax or emissions trading scheme) that is outside the scope of the work under country's existing Market Readiness Proposal; and B. Upstream analytical policy support aimed at helping countries to establish their post-2020 mitigation scenarios and identify a package of effective and cost-efficient instruments (including carbon pricing instruments) to achieve mitigation and development goals ("Post 2020 Mitigation Scenarios"). It was assumed that this PMR support would facilitate countries' work in preparing their mitigation component for "intended nationally determined contributions" (INDCs) under the UNFCCC process.
3. The Secretariat prepared this Note with the objective to inform the PA on status of the work, scope and timeline for planned activities, as well as corresponding resource allocations. Going forward, the Secretariat will regularly inform the PA about future activities under the analytical policy work.

II. UPDATE ON ACTIVITIES SO FAR

A. Targeted Support to Countries to Design and Implement Carbon Pricing Instruments

4. In response to the recent domestic policy developments, two countries – Chile and Mexico – stated their interest in obtaining targeted support for the design and implementation of a specific instrument, such as carbon tax (in case of Chile) and emissions trading scheme (in case of Mexico). While the scope and modality of targeted support to Mexico's ETS in power sector is yet to be finalized, technical support to Chile has advanced and is now in the phase of the Terms of Reference (TOR) preparation.

5. In particular, the scope of work in Chile is expected to include studies which will analyze: (i) what technological changes in the energy sector could be induced by the introduction of the carbon tax; (ii) interaction of carbon tax with existing policies and regulations in the energy sector; and (iii) key issues related to carbon tax design features, such as competitiveness, increase of tax rate over time, and others. The Secretariat will inform the PA on the exact scope, timeline and resource allocation for analytical support, as the TORs get finalized.

B. Upstream Analytical Policy Support on Post-2020 Mitigation Scenarios

6. The scope of the upstream analytical policy work on post-2020 mitigation scenarios can be grouped into the following categories: (1) development of a common technical guidance on analytical approaches, technical methodologies and processes for setting post-2020 mitigation scenarios; (2) country-specific support; and (3) national and international workshops, technical meetings and consultations.

Common Technical Guidance

7. Building on the initial work outlined in the PMR Note PA8 2014-2, presented at PA8 in Mexico City, the common technical guidance (“checklist”)¹ will provide a flexible menu of the latest analytical tools, developed by the World Bank and other organizations, to meet the needs of the PMR countries. As such, it is intended to compare methodologies and facilitate transparency and comparability of analytical approaches, technical methodologies and processes used by countries to set their post-2020 mitigation scenarios. Furthermore, the “checklist” can be further used to help countries identify important gaps or shortfalls in their own methods and tools, as well as foster mutual understanding of the approaches and basic principles.
8. The “checklist” will set out a framework that may include, but not necessarily be limited to, the following components: (1) emission reference (baseline) scenario; (2) alternative emission scenario and pathway; (3) package of policies and measures, including carbon pricing instruments for achieving mitigation targets in various scenarios. The “checklist” will help “decompose” scenario setting and identify sources of data and assumptions used for calibrating the models, including parameters related to global and external trends (e.g. global commodity \$technology costs/prices).
9. Once the “checklist” is fully developed, the PMR Secretariat will make it available for all other countries as a key knowledge product that will benefit all other countries.

Country-specific Work on Establishing Post-2020 Scenarios

10. The following Implementing Countries submitted expressions of interest (EoIs) in seeking support on establishing their post-2020 mitigation scenarios and identify a package of effective and cost-

¹ The common technical guidance will be structured as a checklist (or menu) of analytical approaches, tools and methodologies. The exact name is yet to be determined.

efficient instruments (including carbon pricing instruments) to achieve mitigation and development goals: Brazil, China, Colombia, Costa Rica, Jordan, Peru, Tunisia and Vietnam.

11. After PA 9 in Cologne, the PMR Secretariat together with the World Bank regional teams carried out further discussions and consultations on the scope of requested with the relevant countries. Based on this feedback, as well as the assessment of the status of the existing PMR work and the World Bank's ongoing country engagement, it was decided to proceed with the following five countries as the first "batch" in supporting post-2020 work: Brazil, China, Costa Rica, Colombia and Peru.²
12. The proposed activities in the five countries differ based on the overall domestic priorities and development stage of the existing work, countries' EoIs and requested scope of work and further consultations that were carried out. More information on the country-specific activities, individual timeline and budget allocation can be found in the Annex. The allocation of the budget for country activities are based on the considerations of (i) scope of the proposed work; (ii) consultations with the relevant country on its budgetary needs; and (iii) the World Bank's experience with the cost for carrying out similar type of work.
13. It is important to note that in light of rapidly changing domestic and international environment, the scope of the work by some countries is still subject to further modifications. As a result, funding allocation may be modified too.

Technical Consultations

14. Following up on the in-country consultations, the Secretariat organized a Technical meeting in Washington, DC on September 25th-26th, 2014 on Approaches and Tools to Setting Mitigation Scenarios. This technical meeting brought together experts from a number of PMR Countries (Brazil, China, Colombia, Costa Rica, Peru, and the US), the World Bank, IDDRI, and other relevant institutions to exchange views and compare methodologies used in constructing post-2020 mitigation scenarios. The meeting also provided an opportunity to consult on scope of activities under the PMR upstream policy work. For more information on the Meeting agenda, Participant list and presentations delivered, refer to the [PMR website](#).
15. Going forward it is expected that more consultations will be held both at the country and regional/international levels in order to facilitate the exchange of information, share lessons and provide input to the development of "checklist".
16. The proposed budget allocations and corresponding timeline for the work to be carried out under the PMR analytical policy support are presented in the table below.

² The government of Vietnam indicated to the PMR Secretariat and the World Bank team that its "iNDC" support is being provided by other development partners. It was understood, however, that Vietnam may seek analytical support at a later stage from the PMR to close any gap. In case of Jordan and Tunisia – and based on the existing World Bank country engagement and an early development stage of their MRPs – it was decided to fold in the upstream policy work in the countries MRPs.

Activity	Expected Completion Date	Total Cost (US\$)
I. Development of checklist	December 2014	Up to 80,000
II. Country support	June/September 2015	Up to 1,050,000
Brazil	June 2015	Up to 150,000
China	June 2015	Up to 300,000
Colombia	June 2015	Up to 250,000
Costa Rica	June 2015	Up to 150,000
Peru	September 2015	Up to 200,000
III. International and National Workshops and technical consultations	June 2015	Up to 150,000
IV.WB country support cost	N/A	Up to 125,000
TOTAL		Up to 1,405,000³

17. Since the activities presented in this Update note cover only the first phase of a larger and longer-term PMR analytical support to countries in development of their post-2020 national scenarios and strategies, going forward, the Secretariat will regularly inform the PA about the future country-specific activities, corresponding timeline and budget allocations.

³ Additional contribution in the amount of \$200,000 has been received from the UK, subject to agreement on the arrangement for funding.

China

The overall objectives of the upstream analytical work for China are two folds: (i) providing technical information, comparison and analysis on the various emission scenarios and pathways that are consistent with China's development goal, including understanding the role of a carbon pricing instrument in post 2020 mitigation scenarios; and (ii) strengthening modeling capacity of the GoC in analyzing mitigation trajectory, impact and policy options.

I. Scope of Work

1. Mapping and assessing existing policies and instruments that have major GHG abatement impact at macro-economic and sectoral levels (energy, industrial sector and building, etc). The objectives of the mapping exercise are to: (i) better understand effectiveness of the relevant policies; (ii) take stock of the existing policies as key input into the description and development of the "reference scenario"; and (iii) identify potential policy gaps in achieving mitigation goals.

2. Reviewing and comparing of the existing and ongoing studies on constructing China's GHG emission scenarios for 2020, 2030 and 2050.

The objectives of this component are to (i) establish a better understanding of the models used in the analyses, their assumptions, structural and functional features, databases, strengths and weaknesses and expected biases; (ii) better understand the design and results of different modeling studies, including determination of the baseline, setting emission targets and trajectories, key assumptions for, and implications of different emission scenarios, costs and benefits of policy and technology choices, impact on economic growth, competitiveness, trade, productions and consumption patterns, structural changes, income distribution, implications for investment, etc.

The result of the work is to propose a consolidated approach to the modeling tools and methodologies for constructing and evaluating emission scenarios both at the sectoral and macro levels.

The work may also include review of various studies carried out by some institutions on the pathway of decarbonization.

3. Understanding methodologies used by other countries in setting their mitigation scenarios

The objectives of this component are to achieve better understanding on how tools and methodologies used by other countries in defining their mitigation scenarios. The work may include comparing modeling tools/methodologies, policy option and impact assessment, deployment of technology, economic costs, and trade off.

4. Provide technical inputs and feedback to "checklist" (or "menu") of analytical tools for analyzing designing and presenting emission scenarios, as proposed by the World Bank

II. Budgetary allocation

Up to \$300,000

III. Timetable

Preliminary reports are expected to be finalized by June 2015.

Colombia

The PMR-supported upstream analytical work will build on analysis carried on under the Colombian Low Carbon Development Strategy (ECDBC) and is embedded in Colombia's INDC assessment roadmap. The focus of work is in economic analysis with MEG4C (Colombia's Climate Change CGE developed by the National Planning Agency (DNP)) and MARKAL-Colombia (energy bottom-up model widely used by Colombian planning agencies).

I. Scope of Work

1. Review of ECDBC emissions scenarios and strengthen robustness of quantitative assessment of sector mitigation options

This component involves reviewing the business-as-usual and baseline scenarios developed under the Colombian Low Emissions Development Strategy (ECDBC), including a closer assessment of underlying assumptions, drivers and uncertainties for future emissions. For the existing set of sector mitigation options to stand as a feasible basis to assess a possible economy-wide mitigation contribution, the process used to assess the sector mitigation options needs to be made more consistent and robust. Hence this component will further involve bottom-up modelling of sector mitigation plans using a common tool, MARKAL-Colombia.

2. Exploring robust emission reduction pathways

The objective of this component is to investigate the emissions scenarios that would result from given mitigation outcomes (i.e., carbon budgets) by 2020/2030/2050, ranging from the one required by science to reach the 2C target (RBS) to the one required by equity and development considerations. The analysis will take due account of uncertainties regarding economic development (as studied in component1) and will assess enabling policy instruments that could deliver these pathways, e.g., performance standards, carbon pricing instruments, and fiscal instruments. The aim is to identify the emissions trajectories that may be desirable and feasible goals for future mitigation contributions and corresponding policy actions, and investigate these further.

3. Build and run a combined top-down/bottom-up energy-economy-environment model

With the aim of obtaining an enhanced assessment of the economic implications of the identified long-term mitigation scenarios, this component will support the preparation and implementation of a modeling work program intended to couple Colombia's MEG4C economic model with the MARKAL-Colombia energy model. The combined model can then be used to re-run the analysis proposed under component C2 with a focus on its macroeconomic implications. Should the need arise, additional models would be considered to complement the combination of the two models.

4. Provide technical inputs and feedback to "checklist" (or "menu") of analytical tools for analyzing designing and presenting emission scenarios, as proposed by the World Bank.

II. Budgetary allocation:

Up to \$250,000

III. Timetable

Component 1 is expected to be finalized by February 2015, while components 2 and 3 are expected to be finalized by June 2015.

Costa Rica

The requested analytical support is embedded in Costa Rica's INDC assessment roadmap aimed at (i) assisting Costa Rica in assessing its aspirational goal of becoming a carbon-neutral economy; (ii) informing its consideration of sector mitigation targets; and (iii) supplementing the ongoing work regarding operationalization of Costa Rica's domestic carbon market.

I. Scope of Work

1. Mapping and assessment of GHG mitigation policies & instruments

The purpose of this component is to assess current/'new' policy options that directly or indirectly target GHG emissions in Costa Rica and to facilitate the analysis of interactions between those policies and other related instruments. It covers, in particular:

- Mapping of relevant policies in sectors with significant impacts on GHG emissions trajectories in Costa Rica, including energy, transport, agriculture sectors; and assessment of the mitigation impact of relevant existing policies and instruments;
- Determination of needs and options for "new" policies/policy instruments and assessment of their impact on incremental emission reduction, as well as complementarity or overlapping between relevant existing and new policy instruments;
- Identification of a mix of policies, regulations and economic instruments that mutually reinforce one another to achieve mitigation objectives in the context of Costa Rica's development priorities.

2. Mid- and long-term scenarios for Economic Growth and GHG Emissions

The aim of this component is to assist Costa Rica in the development of alternative emissions scenarios (2020, 2030, 2050) using readily available national data on economic and emissions trends, technological options, policies in place/options for new policies. Economic and social impact of these scenarios and policy mixes to achieve them will be conducted according to good practices for economic analysis of mitigation actions to identify the least cost policy mixes to achieve various mitigation outcomes, including carbon neutrality target (see component 3).

3. Recommendations on shaping national and sectoral abatement targets – pathway to achieving carbon neutrality

Recommendations to inform the formulation of Costa Rica's NDC will be elaborated under this component, building upon the work carried on in the preceding components. Given Costa Rica's stated aspirational objective of becoming a carbon neutral economy by the next decade, the elaboration of recommendations on possible mitigation outcomes entails (i) laying out a robust pathway towards the long-term carbon neutrality goal; (ii) identifying shorter-term milestones in terms of emissions or carbon intensity, by sectors; and (iii) prioritizing a set of sector and economy wide policies that can credibly achieve those shorter-term mitigation targets and at the same time be consistent with the long-term carbon neutrality goal and development goals.

4. Provide technical inputs and feedback to "checklist" (or "menu") of analytical tools for analyzing designing and presenting emission scenarios, as proposed by the World Bank.

II. Budgetary allocation

Up to \$150,000

III. Timetable

Component 1 is expected to be finalized by February 2015, while components 2 and 3 are expected to be finalized by June 2015.

Peru

The upstream analytical work aims at strengthening the economic, macroeconomic and financial analysis of GHG mitigation options in order to better inform the Peruvian government on GHG emission reductions pathways and enabling policy instruments. The work will build on analysis made, inter alia, under the PlanCC (Proyecto de Planificación ante el Cambio Climático) program, which has provided Peru with an emission baseline and a catalog of mitigation options. Peru intends to use this information in its NDC determination process.

I. Scope of Work

1. Broaden the scope of the analysis of selected mitigation options

The analysis of the set of mitigation options identified under PlanCC and other relevant studies will be extended, by quantifying: (a) the financial cost of the mitigation options, disaggregated by public and private sectors costs, and exploration of both national and international financing options; (b) quantified social co-benefits (such as reduction of congestion or air pollution); (c) the cost of enabling conditions (for instance, targeted incentive schemes); and (d) implementation costs for the private sector (e.g., transaction costs, taxes on energy, labor and investment; weighted cost of private capital).

2. Build emission-reduction pathways from the list of GHG mitigation options

The objective of this component is to investigate the least-cost basket of (mid-term) mitigation options that would maximize national and local co-benefits while allowing Peru to develop in a sustainable way that 'lets the door open' to long-term decarbonization objectives (i.e., up to 2050). This component will make use of the Macinert model developed at the World Bank, which requires that the pace at which options may be implemented and scaled up (limited by factors such as capital turnover in emission-intensive sectors, availability of funding and skilled workers, institutional bottlenecks) is explicitly quantified. In addition to determining a given GHG mitigation outcome by 2030, the goal is to identify short-term actions (2015-2030) that would make it possible to achieve that outcome within a long-term low-carbon development strategy (2015-2050 and beyond).

Data collected under component 1 and 2 will further be used to assess enabling policy instruments that can deliver these pathways, for instance performance standards, carbon pricing through quantity or price instruments, and fiscal instruments.

3. Assess the macro-economic aspects of emission reduction pathways

This component will analyze the economy-wide impacts of the proposed mitigation pathways and enabling policy instruments. Variables to be considered, depending on modeling capacities, include GDP: sectoral output growth rates, wages and profits, international trade, energy intensity of trade flows, and income distribution and poverty impacts. The analysis will include analysis of carbon pricing and other transversal policy instruments, and will involve sensitivity analysis with respect to key variables, such as energy prices and baseline growth rates.

4. Provide technical inputs and feedback to "checklist" (or "menu") of analytical tools for analyzing designing and presenting emission scenarios, as proposed by the World Bank.

II. Budgetary allocation

Up to \$200,000

III. Timetable

Component 1 and a preliminary application of Macinert will be completed by February 2015, while its refined application and component 3 are expected to be finalized by September 2015.

Brazil

Due to domestic development and ongoing work by other development partners, the scope of Brazil's work is still subject to further modifications. Consultations with the relevant agencies in Brazil demonstrated a few gaps in the ongoing work which are being supported by other institutions and identified specific tasks that will complement ongoing or planned activities, as well as not overlap with Brazil's existing work under the PMR, which explores options for various types of carbon pricing instruments in order to select a suitable one for implementation, as well as build modeling capacity and carry out analytical work on carbon tax.

I. Scope of Work

1. Analyzing low-carbon back-up power options for low-hydrology scenarios

Building on the low hydrology scenarios that have already been developed in Brazil, the objective of this component is to explore options for mitigating the risk of the increased water flow variability on the Brazilian power system. A key output will be the feasibility and least cost analysis of the options to ensure reliable back-up generation capacity when there is a shortfall in hydro-generation due to droughts. The options considered will include, but not necessarily be limited to thermal generation (coal, oil or gas), dispatchable renewable generation (biomass, biofuels), electricity imports (investments in interconnectors and setting transparent trading rules) and the price-driven demand side response. Policy and market design options to provide this reliable back-up power will also be analyzed, such as auctions for ancillary services, contingency funding schemes and carbon pricing. Expected additional GHG emissions for different options and their impact on the national emission profile will be simulated.

4. Provide technical inputs and feedback to "checklist" (or "menu") of analytical tools for analyzing designing and presenting emission scenarios, as proposed by the World Bank

II. Budgetary allocation

Up to US\$150,000

III. Timetable

Preliminary report is expected to be finalized by March 2015.