



WORLD BANK CARBON FINANCE UNIT
CARBON PARTNERSHIP FACILITY
2014 ANNUAL MEETING

CPF NEW CREDITING INSTRUMENTS: PILOT CONCEPTS

New carbon crediting programs - principles



◆ Supporting UNFCCC process

- Piloting to inform negotiations on new market mechanisms;
- Supporting developing countries to contribute to net global emission reductions;
- Generating carbon credits with potential for UNFCCC recognition for compliance and/or delivery of results-based climate finance.

◆ Contributing to net global mitigation

- Only part of ERs credited as international offsets (multiple approaches possible);
- Programs might need to be supported by host countries own efforts and/or international climate/development finance.

◆ Targeting broad segments of the economy

- Up-scaling beyond project level;
- Improved environmental integrity: linking crediting to achievements in aggregate.

Types of pilot programs

◆ Activity based programs

- Example: incentive program for renewable energy;
- Operation: attracting predefined mitigation activities;
- ER quantification: attribution approach.

◆ Sector based programs

- Example: low carbon cement sector program;
- Operation: achieving sector performance improvement, no predefined mitigation activities;
- ER quantification: complete facility level MRV, no attribution.

◆ Policy based programs (outside scope of current CDM)

- Example: acceleration of fossil fuel subsidy removal;
- Operation: achieving policy improvement, no predefined mitigation activities;
- ER quantification: policy MRV (indicator enhanced ex-post modelling), attribution approach.

Overview of the pilot concepts

| Type | New Carbon Crediting Program pilots |
|------------------------|---|
| Activity-based Program | Indonesia Off-Grid Rural Electrification Program |
| | Indonesia SWM Improvement Program |
| | Sri-Lanka Non-conventional Renewable Energy Development Program |
| | India Scaled Up Energy Efficiency Program |
| | Mexico Sustainable Urban Community Pilot |
| | Thailand Low Carbon City Program |
| | Vietnam NMM for Steel and SWM Sector |
| Sector-based Program | India Cement Sector Energy Efficiency Improvement |
| | Morocco NMM for the Cement Sector |
| | Tunisia NMM for the Cement Sector |
| Policy Program | Vietnam Energy Pricing Reform Policy MRV |

Indonesia Off-Grid Rural Electrification Program



Objective

- ◆ Use a market-based instrument to support off-grid rural electrification program that aims to improve access to electricity in rural areas of Indonesia while increasing renewable energy in the generation mix

Key Elements

- ◆ Strategic Context:
 - Indonesia's electrification rate remains at ~76%, 60 mil Indonesians still do not have basic access to electricity.
 - Government set target to reach 90% electrification coverage by 2020. Power sector's contribution to national GHG emission projected to rise from 6.3% in 2012 to 11.7% in 2020.
 - GoI 's non-binding commitment to reduce GHG by 26% unilaterally and up to 41% with international assistance
 - PMR already engaged in power sector: support establishment of MRV system in Java-Madura-Bali grid
- ◆ Proposed Program: Invest in the conversion of existing diesel based generation to renewable-diesel hybrid systems, new RE greenfield projects using solar PV and mini-hydro systems, and network expansion at installation sites to improve energy access in Indonesia's outer islands
- ◆ Phase I: target capacity installation of 60MW of which 35MWp is solar PV and 25 MW is mini-hydro. Financed by World Bank loan of \$100 million with potential KfW co-financing \$100 mil.
- ◆ Will go to Board in Sept. 2014. WB loan for Phase II will follow. PLN (state-owned power utility) will implement the program in phases.

Progress to Date and Next Steps

- ◆ CPF team has reviewed an initial concept note and provided feedback to the Region.
- ◆ The regional team carried out dialogue with key counterparts including Ministry of Energy and Mineral Resources, PLN, National Council on Climate Change. The NCCC expressed support and PLN gave green light to pilot.
- ◆ Following signal of PLN support, endorsement of CPF Buyer Participants will be sought for initiating discussion with the government of Indonesia to sign MoU and start preparation of the PIN.



Indonesia Off-Grid Rural Electrification Program



| Element | Description |
|-------------------------|--|
| Aggregation | Power sector as whole |
| Baseline | Historical trend of power plant emissions or simulation/modeling of the sector considering government future plans, usage profile of unconnected households (and their suppressed demand) and considering other 'low' cost options available |
| Net emission reductions | #1: power generation using renewable energy technologies beyond the domestic target #2: Based on the emission intensity targets (tCO ₂ /MWh) set and agreed using ambitious weightage factors of OM and BM |
| MRV | Established at the aggregated level (based on the established sectoral practices for data collection and reporting) |

Indonesia SWM Improvement Program

Objective

- ◆ Support solid waste management (SWM) improvement in participating municipalities in Indonesia through selective interventions in waste minimization, collection, transfer, separation and disposal.

Key Elements

- ◆ Strategic Context:
 - Average collection and landfill disposal rate for urban sector is only 50% and 20% for rural solid waste
 - 90% of MSW disposal site use “open dumping” disposal methods
 - 2008 Waste Management Act requires all landfills be operated under sanitary conditions. Ministry of Public Works provide block grants to cities to implement the 2008 law
 - Waste sector accounts for 11% of national GHG emission and have a potential of 114 MT emission reductions
- ◆ 3 proposed components 1) improve waste collection and treatment facility and incorporate 3R approach (reduce, reuse recycle) in the design and infrastructure work, 2) implementation support and advisory services including establishing a country-wide carbon/climate finance program for SWM sector and setting up National Solid Waste Benchmarking System 3) social development to support households affected by the project
- ◆ Total financing: \$142.5 million, 3 participating municipalities (Balikpapan, Manado, and Tangerang)
- ◆ Ministry of Public Works will coordinate and implement the project.

Progress to Date and Next Steps

- ◆ CPF team has reviewed an initial concept note and provided feedback to the Region.
- ◆ Appraisal mission in Jan 2014, Board approval June 2014.
- ◆ Stakeholder consultation and dialogue with key counterparts (National Council on Climate Change, Ministry of Public Works) will start after CPF participants confirm interests.

Indonesia SWM Improvement Program

| Element | Description |
|-------------------------|---|
| Aggregation | Whole waste sector in the country to capture the upstream efforts as well as the usual end-of-pipeline approaches at the final stage of waste disposal |
| Baseline | #1: Historical waste collection practices and technologies used #2: Modelling to take population and economic growth and waste generation in to account |
| Net emission reductions | #1: Least cost available technologies for waste management vs technologies that are costly and improves waste management practices #2: Scenario analysis with different mitigation options and based on agreed crediting baseline scenario #3: Mitigation from activities planned beyond under the current waste management act |
| MRV | Established at the aggregated level (based on the established sectoral practices for data collection and reporting); based on proposed national solid waste benchmarking inventory database. |

Sri Lanka's Non-conventional Renewable Energy Development (NCRE) Program



Objective

Use a market-based instrument to support Sri Lanka to achieve its 20% electricity generation target from Non conventional renewable energy (NCRE) by 2020

Key Elements

Strategic context

- ◆ Sri Lanka's "Mahinda Chinthana 10 year development Framework (2010-2020)", targets a share of 20% NCRE by 2020. The share increased from 4.07% in 2008 to 6.34% in 2014. Additional 719 MW installed capacity required costing \$1.65 billion.
- ◆ Current positive program features include: (i) availability of private power producers/generators, (ii) reasonable policy and regulatory environment including a) Sustainable Energy Authority which regulates and promotes the sector, and b) Ceylon Electricity Board which generates power, transmits sells and also purchases from private power generators; (iii) conducive financial climate including commercial bank lending to the sector, a positive feed in tariff and a national carbon fund.
- ◆ Despite the above, barriers exist including , technical, financial, information, policy and institutional.

Preliminary Program design

- ◆ Program intermediary could be the Sri Lanka Carbon Fund (Govt owned private fund) which would receive income derived from the sale of carbon credits. Use of income is being explored as follows: to provide various types of guarantees for private power generators; to help finance the feed-in tariff or to provide credit enhancement of power generators debt; and
- ◆ Establish a crediting baseline, a robust MRV framework to avoid double counting and verify program results as a basis for carbon payments to the Carbon Fund

Progress to Date and Next Steps

- ◆ Sri Lanka is working off a sound NCRE program foundation
- ◆ Support Sri Lanka to firm up the carbon crediting program design and to prepare a PIN, undertake Bank due diligence
- ◆ Support Sri Lanka to bring other partners into the program to provide financial and technical support and to build capacity

Sri Lanka's Non-conventional Renewable Energy Development (NCRE) Program



| Element | Description |
|-------------------------|--|
| Aggregation | Power sector as whole |
| Baseline | Historical trend of power plant emissions or simulation/modeling of the sector considering government future plans and considering other 'low' cost options available |
| Net emission reductions | #1: power generation using renewable energy technologies and then share the emission reduction between domestic target and selling in the international market #2: Credit as long as there is a decreasing trend in the grid emission factor calculated using an agreed methodology |
| MRV | Established at the aggregated level (based on the established sectoral practices for data collection and reporting) |

India: Scaled up Energy Efficiency and Demand Side Management Crediting Mechanisms



Objective

Energy Efficiency Services (EESL) India is considered by IBRD as a strategic partner due to its potential to lead and in some cases implement scaled up crediting programs in India. First 3 programs include: (i) LED street lighting in municipalities; (ii) energy efficient equipment in micro to medium enterprises; and (iii) LED residential lighting.

Key Elements

- ◆ Technology and cost break throughs in LED lighting present opportunities in both street lighting and in the residential sector. EESL Energy audits have shown that significant energy efficiency improvement opportunities exist in micro to medium size enterprises.
- ◆ EESL has identified the barriers and program design features which need to be implemented in order to support the switch to LED lighting in both public streets and in households and the switch to energy efficient equipment in micro to medium size industries.
- ◆ Some of the common design elements of the LED street lighting program and the micro to medium size business program include the need for additional resources to reduce technology costs, proving the technologies, reducing the payment risks to ESCOS through establishing partial risk guarantee schemes / funds, demonstrating that the proposed simplified methodologies for calculating energy savings work and establishing EESL capacity and track record. For LED residential lighting, EESL would install the lights and sell the bulk energy savings back to utilities.

Progress to Date and Next Steps

- ◆ Progress: EESL has undertaken the overall design for each program. For street lighting it has designed the program for 9 municipalities (1 million lamps); for micro to medium enterprises, concluded energy audits and identified energy efficiency technologies (demonstrations implemented in 19 of 112 clusters. For residential LED lighting, designed the mechanism for selling bulk energy savings from LED residential lighting back to utilities (Case of Puducherry - 735,000 lamps).
- ◆ Next Steps: Preparation of pre pins demonstrating scaled up crediting mechanism approach for generating VER assets through a non CDM methodology. Discuss cement sector next steps.

Mexico Sustainable Urban Community Pilot

Objective

- ◆ Pilot program will provide international support to the implementation of the *Urban NAMA: Designing Sustainable Communities* (developed under the PMR) through a market-based instrument.
- ◆ The pilot will help leverage local private commercial and international climate finance mobilized by the Urban NAMA for selected applications and will help demonstrate and deploy the Urban NAMA nation-wide.

Key Elements

- ◆ Strategic context: (i) the Urban NAMA is currently being updated to reflect the most recent sustainable urban development strategy (e.g., in coherence with sustainable mobility); (ii) the leadership has been consolidated within a newly established federal authority (SEDATU).
- ◆ Proposed Pilot:
 - To provide financial support through the overall incentive scheme of the Urban NAMA as per pre-established community performance criteria (including housing, lighting, and solid waste, low-carbon transportation).
 - To design and test cost-effective aggregate MRV system, including performance management, to inform the design of the overall NAMA MRV system.

Progress to Date and Next Steps

- ◆ CPF team closely follows-up on the Urban NAMA updates and contribute to definition of objectives and priorities for piloting activities (by March 2014);
- ◆ Conceptual work on Scaled-up Market-Based Instruments for Cities (supported by CADF) will explore Mexico Sustainable Community case study (by the end of 2014);
- ◆ Upon a first phase of NAMA development by Mexican authorities, endorsement of CPF Buyer Participants will be sought for initiating discussion to sign MoU and start preparation of the PIN (expected in 2015)

Thailand Low Carbon City Program

Objective

- ◆ Use a market-based instrument to support municipalities and communities in achieving the national goal to shift towards a low carbon society by implementing GHG emission reduction activities.

Key Elements

- ◆ Strategic Context:
 - Thailand is establishing a Thailand Voluntary Emission Reduction program (T-VER) (originally the end of 2013).
 - Thailand also launched Thailand Carbon Offsetting Program (T-COP) in August 2013.
 - Building on these two initiatives, Thailand is preparing a Market Readiness Proposal for two initiative instruments, 1. Energy Performance Certificate Scheme (EPC). 2. Low Carbon City program (LCC).
 - Support from ESMAP's City Energy Efficiency Transformation Initiative
- ◆ Scope and Coverage:
 - Eligible participants: 2,283 Thai municipalities and local communities (32 municipalities at the pilot phase)
 - GHG covered: CO₂, CH₄ and N₂O.
 - Sectors covered: EE, Alternative Energy (Bio-diesel, ethanol), RE, SWM, Transportation, Forestry and Green Area, Agriculture.
- ◆ Potential ERs generated from the LCC Program: 8.6 M tCO₂e from 2015 to 2030.
- ◆ Implementation: The LCC Fund will be established by the Government of Thailand. Its core activities are: (i) providing TA, (ii) project identification and screening, (iii) supporting to create an investment and finance structure, (iv) identifying sources of debt-financing, (v) providing carbon finance, (vi) organization and co-organization of events, (vii) promotion, outreach and business development to promote LCC program.
- ◆ Timeline: 2014-2016: LCC Preparation Phase; and 2017-2025: LCC operation phase.

Progress to Date and Next Steps

- ◆ Thailand will present the MRP for PMR participants' approval in March 2014.

Vietnam NMM for Steel, SWM and EE in Building Sector

Objective

- ◆ Vietnam intends to apply market-based instruments to steel, SWM, EE in building and cities with a view to broadening the scope cover time. The aim is to achieve broad-based carbon pricing over time.

Key Elements

- ◆ Strategic Context
 - Vietnam adapted the National Climate Change Strategy (i.e. setting objectives of low-carbon economy) and National Green Growth Strategy (i.e. GHG reduction target setting) in 2011 and 2012, respectively.
 - NAMAs in preparation in Vietnam: Solid Waste, Steel Sector, Cement Sector, Wind Power and Biogas in Rural Area.
 - Vietnam is preparing a Market Readiness Proposal. The target sector for the NMM development will be discussed with the Government of Vietnam.
- ◆ Solid Waste Management
 - Options: (i) project-level crediting, (ii) policy-level crediting, and (iii) cap-and-trade systems for waste sector
 - Timeline: until end 2014: preparation phase; 2015-2020: implementation phase
- ◆ Energy Efficiency for Buildings
 - Options: (i) sector-crediting
 - Timeline: until 2015: baseline surveys, 2015-2020: NAMA and performance-based payment; 2020-: crediting mechanism
- ◆ Steel
 - Options: (i) NAMA, (ii) Domestic Allowance and Incentive Mechanism and (iii) Cap-and-trade
 - Timeline: (i) until 2015: development of NAMA proposal, (ii) until 2016: development of domestic market crediting mechanism, and (iii) until 2020: launch of cap-and-trade system

Progress to Date and Next Steps

- ◆ Vietnam will present a draft MRP in May 2014.

India Cement Sector Energy Efficiency Improvement

Objective

- ◆ Work with India cement sector, Govt and key stakeholders to implement the India cement sector Low Carbon Roadmap, which aims to reduce emissions intensity by approximately 45% by 2050. Emissions will conservatively be reduced by at least 78 Mt CO₂ e p/a.

Key Elements

- ◆ The Roadmap explicitly envisages carbon markets helping to finance activities. The carbon market feasibility of the following approaches is being reviewed by CPF. Support India to:
 - implement the existing Perform and Trade Scheme (PAT), which sets 3 year targets for the designated cement plants to reduce their energy intensity by 1-2% p/a;
 - Design and implement a partial crediting scheme to help achieve emissions targets, or targets above the low carbon roadmap (sectoral crediting/NMM); or
 - use the current CDM Program of Activities approach to support plants to reduce emissions. This could be a fall back position if the first two approaches prove unfeasible or too time consuming.
- ◆ Overall cost estimated at \$28 billion. Carbon finance could contribute several billion Euro.

Progress to Date and Next Steps

- ◆ The World Business Council for Sustainable Development, working with the local organized cement sector, IEA and the IFC has produced the Low Carbon Technology Roadmap which reviews the 27 possible technologies including cost, timeframe and barriers – about 17 are additional. Govt has knowledge/ involvement.
- ◆ IFC is following up with further technical support to review best technologies to pilot.
- ◆ CPFCF has gained experience from Indonesia cement project (fuel switch and blended materials).
- ◆ Meet with Government (Ministries for climate change, industry and energy (BEE)) and industry to test interest in cement or other sector – earlier meetings were pended as India was clarifying its position on NMM. Now more favorable.

Morocco NMM for the Cement Sector

Objective

- ◆ Use scaled-up crediting mechanism to support the implementation of GHG emissions mitigation measures in the cement sector, and boosting investment in less carbon-intensive technologies.

Key Elements

- ◆ Strategic Context:
 - Cement production in 2012: 15.8 Mt of cement.
 - With 9.5 MtCO₂e emitted and a carbon intensity of 0.6 tCO₂e/t cement, the cement sector accounts for approximately 11% of Moroccan GHG emissions.
 - Important growth rates: 7-8%/year.
 - Morocco sees a potential in using the NMM to reach the ambitious goals of its energy strategy: Morocco wants to reduce energy consumption by 12% by 2020 compared to 2009 and 15% by 2030. In addition, it wants to use renewable energies for 42% of its total power generation by 2020.
- ◆ Proposed Program: Piloting of several types of emission reduction measures:
 - Renewable energy, notably wind energy;
 - Use of alternative fuels and materials (co-processing and blended cement);
 - Co-generation.

Progress to Date and Next Steps

- ◆ The Moroccan government will present its Market Readiness Proposal to the PMR in March 2014, which includes readiness activities in the cement sector.
- ◆ Morocco is planning to establish a capacity-building program, implement a national MRV system, and select sectors suitable to pilot an NMM from 2017 onwards.
- ◆ Following signal of PMR support, pre-Pin will be prepared and endorsement of CPF Buyer Participants will be sought for initiating discussion with the government of Morocco to sign MoU and start preparation of a PIN.

Tunisia NMM for the Cement Sector

Objective

- ◆ Use of scaled-up crediting mechanism to support the implementation of GHG emissions mitigation measures in the cement sector, and boosting investment in less carbon-intensive technologies.

Key Elements

- ◆ Strategic Context:
 - Cement production in 2012: 7.9 Mt of cement.
 - With 6.4 MtCO₂e emitted and a carbon intensity of 0.810 tCO₂e/t cement, the cement sector accounts for around 10% of Tunisian GHG emissions.
 - According to a “business-as-usual” scenario, established as part of Tunisia’s collaboration with GIZ, the Tunisian cement sector is likely to emit around 11.5 MtCO₂e by 2020, with a carbon intensity of 0.793 tCO₂e/t cement produced.
- ◆ Proposed Program: Piloting of four types of emission reduction measures:
 - Energy efficiency measures (ER potential: 1.7 MtCO₂e for the period 2014-2020);
 - Renewable energy, notably wind energy (ER potential: 2.5 MtCO₂e for the period 2014-2020);
 - Finer segmenting of the cement market, allowing a reduction of the clinker/cement ratio (ER potential: 1.2 MtCO₂e for the period 2014-2020);
 - Co-processing (use of waste as a fuel) (mitigation potential: 2.6 MtCO₂e over the period 2014-2020).

Progress to Date and Next Steps

- ◆ CPF team has reviewed an initial NAMA/NMM proposal, prepared by the Tunisian National Agency for Energy Conservation (ANME), with the support of GIZ.
- ◆ The Tunisian government plans to include this mechanism as part of their future Market Readiness Proposal to seek PMR support.
- ◆ Following signal of PMR support, pre-Pin will be prepared and endorsement of CPF Buyer Participants will be sought for initiating discussion with the government of Tunisia to sign MoU and start preparation of a PIN.

Vietnam Energy Pricing Reform Policy MRV

Objective

- ◆ Develop MRV methodology for fossil fuel subsidies removal, focusing on market-based coal and electricity pricing
- ◆ Explore the feasibility of piloting the methodology in Vietnam

Key Elements

- ◆ Context
 - Vietnam Green Growth Strategy targets to reduce GHG intensity at 8-10% by 2020 relative to 2010, then reduce at least 1.5-2% of total annual emissions towards 2050
 - Broad commitment of GoV to adopt market-based coal and electricity pricing. Some progress made but lack clear roadmap of price transition.
 - Domestic coal price (\$35/ton) VS production cost (\$50/ton) in 2012 → coal subsidy ~\$195million in 2012
 - Little electricity price subsidy at present. But, continued effort is needed to adjust current electricity tariff to higher cost-recovery level that is expected as a result of increasing fuel prices
- ◆ Initial dialogue with GoV will be done through ESMAP TA on assessment of low carbon development options in Vietnam
- ◆ MRV tool and user's guide (focus on power generation sector, with national geographical coverage)
- ◆ Case study (using MRV tool and hypothetical scenarios to illustrate ex-post MRV implementation)
- ◆ Tool piloting/testing

Progress to Date and Next Steps

- ◆ Good progress with conceptualization of methodology and base data collection
- ◆ Core model/framework ready to be tested (several agencies in VN are familiar and/or trained to utilize this framework)
- ◆ Next steps:
 - Improve and finalize first version of MRV tool
 - Analysis of Vietnam case
 - Seek feedback from stakeholders and gauge interest of GoV in piloting
 - Coordinate with PMR activities in Vietnam

General Observations of Pilot Concepts

- ◆ Pilot concepts at very early stage – require clarity on:
 - Implementing agencies' capacity and effectiveness of policy instruments
 - How emitters in identified sector will respond to policy and carbon incentive
 - Required investment and source of financing
 - Emission reduction target
 - Timeline for physical implementation and ER delivery

- ◆ Benefit of building pilots on WB's country policy dialogue and PMR's MRP consultation process
 - Identified sector in line with the host country's climate mitigation strategy and priority
 - Give host country ownership and buy-in for potential piloting

- ◆ Crediting concepts will need to adapt to evolving regulatory environment

New Program Development: Aligning Incentives



- ◆ Piloting new crediting instruments requires support and engagement of both Buyers and Sellers (host country)
 - Programs need to have strong support from host country and align with mitigation strategies
 - Need to determine potential interest of Buyer Participants in sector/program

- ◆ To engage host countries need:
 - Early support from CPF Buyers
 - Prospect of financial resources to purchase credits

- ◆ Roadmap for mutual confidence building culminating in:
 - Program development and implementation by governments
 - CPF purchase of credits from pilots