



Market Readiness Proposal to the Partnership for Market Readiness

Sri Lanka

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Acronyms

Advisory Committees (ACs)
Agriculture, Forestry and Other Land Use (AFOLU)
Asian Development Bank (ADB)
Building Block (BB)
Bus Rapid Transit (BRT)
Business-As-Usual (BAU)
Carbon Partnership Facility (CPF)
Carbon Pricing Instrument (CPI)
Certified Emission Reduction (CER)
Ceylon Electricity Board (CEB)
Central Environmental Authority (CEA)
Clean Development Mechanism (CDM)
Climate Change Secretariat (CCS)
Corporate Social Responsibility (CSR)
Data Management System (DMS)
Demand-Side Management (DSM)
Emission Trading Scheme (ETS)
Executive Board (EB)
Feed-in Tariff (FIT)
Fuel Quality Standards (FQS)
Designated National Authority (DNA)
Geographic Information System (GIS)
Global Environmental facility (GEF)
Global Fuel Efficiency Initiative (GFEI)
Greenhouse Gas (GHG)
Green Climate Fund (GCF)
Initial National Communication (INC)
Key Performance Indicators (KPI)
Lanka Electricity Company (Private) Limited (LECO)
Liquefied petroleum gas (LPG)
Marginal Abatement Cost Curve (MACC)
Market Readiness Proposal (MRP)
Millennium Development Goal (MDG)
Ministry of Mahaweli Development and Environment (MMDE)
Ministry of Environment and Renewable Energy (MERE)
Ministry of Environment and Natural Resources (MENR)
Monitoring/Measurement, Reporting and Verification (MRV)
Municipal Solid Waste (MSW),
National Green Reporting System (NGRS),
National Project Coordinator (NPC)
Nationally Appropriate Mitigation Action (NAMA)
Nationally Determined Contribution (NDC)

National Designated Authority (NDA)
Non-Conventional Renewable Energy (NCRE)
Partnership Assembly (PA)
Partnership for Market Readiness (PMR)
Project Management Unit (PMU)
Project Steering Committee (PSC)
Public Utilities Commission of Sri Lanka (PUCSL)
Results-Based Climate Finance (RBCF)
Second National Communication (SNC)
SMART (Specific, Measurable, Achievable, Realistic and Time bound)
Sri Lanka Carbon Crediting Scheme (SLCCS)
Sri Lanka Climate Fund (SLCF)
Sri Lanka Certified Emission Reductions (SCERs)
Sri Lanka Sustainable Energy Authority (SLSEA)
Sustainable Development Goals (SDG)
Sustainable Guarantee Facility (SGF)
Climate Change Secretariat (CCS)
Market Readiness Proposal (MRP)
National Council for Sustainable Development (NCSD)
Third National Communication (TNC)
Total Primary Energy Supply (TPES)
United Nations Development Program (UNDP)
United Nations Framework Convention on Climate Change (UNFCCC)
Verified Carbon Standard (VCS)

Background

The Partnership for Market Readiness (PMR)¹ is a grant-based, capacity building trust fund that provides funding and technical assistance for the collective innovation and piloting of carbon-pricing instruments (CPIs) that reduce greenhouse gas (GHG) emissions. The PMR brings together developed and developing countries, as well as other key experts and stakeholders, in order to provide a platform for technical discussions on CPIs, South-South exchange, collective innovation for pilot efforts and the implementation and scale up of financial flows. For some countries, the first step towards implementing CPI is to build market readiness capacity, such as measurement, reporting and verification (MRV) systems, data collection, baseline setting, and establishing regulatory institutions, or the study, identification and preparation of scaled-up crediting instruments.

During the preparation phase, Implementing Country Participants need to prepare a Market Readiness Proposal (MRP)². The MRP lays out the country's planned activities to develop the proposed CPI and market readiness components, and provides the timeline and budget estimates for implementation. The MRP is the reference based on which the Partnership Assembly (PA) decides on the level of PMR funding to the Implementing Country. It therefore needs to provide a clear, detailed and convincing picture of why, what and how PMR resources will be used. Based on the PA's approval, the Implementing Country implements the readiness components outlined in the MRP, including piloting the proposed CPI(s) where appropriate.

The Government of Sri Lanka became an Implementing Country Participant of PMR, following the presentation of its Organizational Framework for Scoping of PMR Activities at the PA meeting in Lima, Peru on April 26 – 29, 2016. The Climate Change Secretariat (CCS) under the Ministry of Mahawelli Development and Environment (MMDE), which is the PMR focal point for Sri Lanka, prepared the MRP with the support of World Bank and is presenting the draft MRP at the next PA meeting of the PMR (PA17) in Tokyo in October 2017.

The Government of Sri Lanka organized two Consultation Workshops to seek feedback and agree on the activities for seeking support from PMR and to prepare the draft MRP. After the draft proposal outline was presented at the National Expert Committee on Climate Change Mitigation, the workshop was held on May 30, 2017, and was attended by 36 participants from relevant Ministries, private sector and expert groups. The second workshop was held on July 11, 2017, and was attended by 26 participants again from various Ministries, private sector and expert groups. For both workshops, the project team presented and received feedback on the core Building Blocks (BB) of the MRP. Bilateral meetings were held with Key institutions such as MMDE and the Department of External Resources and Department of National Planning within the Ministry of National Policies and Economic Affairs as well as industrial associations including the Ceylon Chamber of Commerce and National Chamber of Commerce for more detailed discussions on the draft. Following these two workshops and discussions, Sri Lanka has submitted the draft MRP to the PMR Secretariat to perform the expert review process. The PMR Secretariat has performed the expert review process with the support from two external experts (Derik Broekhoff, Senior Scientist, Stockholm Environment Institute and Neelam Singh, Senior Associate, World

¹ <https://www.thepmr.org/>

² See the document by the World Bank PMR Secretariat: "Tool for Market Readiness Proposal" – Version 3.0 - Guidance Document.

Resources Institute). Upon receipt of the expert reviewers feedback, an Expert Review Meeting was then held in Sri Lanka on 11- 12, September 2017 to discuss and respond to the feedback received. Upon these discussions, Sri Lanka has updated the draft MPR and submitted to PMR Secretariat on 9, October 2017 for the PA's consideration.

Executive Summary

Sri Lanka is a rapidly-growing lower middle-income country with a total population of 21 million people and per capita income of USD 3,924 in 2015. While Sri Lanka's GHG emissions represent less than 0.1% of global emissions, efforts to mitigate climate change have become increasingly important to curb expected emissions growth and ensure sustainable development, as the country strives to become an upper middle-income country. In particular, since Sri Lanka does not have any domestic production of coal, petroleum or natural gas, mitigation effort in the energy sector will be particularly important to reduce the country's reliance on fossil fuel imports and ensure sustained economic growth. Against this backdrop, Sri Lanka proposed two key 2030 mitigation targets as part of its Nationally Determined Contribution (NDC) for the UNFCCC's Paris Agreement: (a) to reduce GHG emissions in the energy sector against a Business-As-Usual (BAU) scenario by 4% unconditionally and an additional 16% conditionally; and (b) to reduce GHG emissions against a BAU scenario in other sectors by 3% unconditionally and an additional 7% conditionally. The NDC further maps out a set of policies and actions to achieve these goals in five priority sectors: energy, transport, waste, industry, and forestry. While Sri Lanka does not explicitly mention the use of carbon pricing to achieve its NDC goals, the government is seeking the PMR's support to enhance the role of carbon pricing to reduce costs and mobilize the resources required to reduce emissions.

BB1 of the MRP provides the overall policy context by laying out Sri Lanka's GHG emissions by sector and key national policies, plans and institutional arrangements for climate change mitigation. The CCS under the MMDE was established in 2008 to coordinate the country's climate change plans and policies at the national level. CCS is responsible for coordinating activities under PMR and acts as the national focal point for the UNFCCC. MMDE, headed by His Excellency President of Sri Lanka, Maithripala Sirisena, is strongly committed to playing a critical role in harmonizing economic growth and environmental sustainability. Sri Lanka has already taken significant steps to ensure a successful NDC implementation. For example, Sri Lanka prepared a "Readiness Plan for NDC implementation" in 2016 to identify policy and institutional gaps, as well as the technical capacity and resources required to implement policies and actions under its NDC. The plan is intended to inform the work plan for relevant ministries during the "Readiness Phase" between 2017 to 2019, before the NDC implementation period from 2021 to 2030. The national climate agenda is guided by two overarching policies at the national level: (a) the National Climate Change Policy, which outlines key principles that should be considered when developing climate actions in the energy, transport, industry, waste and agricultural sectors; and (b) the "Sri Lanka NEXT - A Blue Green Era" Program, which identifies priority technologies and subsectors for a low carbon economy based on the country's sustainable development priorities.

BB2 identifies the underlying analytical work required to provide a clear rationale and context for supporting activities proposed under BB4 as well as core readiness components (e.g., MRV and registry systems) that would be supported under BB3. The first part provides a preliminary analysis of the mitigation potential and policy landscape in sectors prioritized under support from the PMR: energy, transport, industry and waste. A key focus of Sri Lanka's existing and planned mitigation efforts is in the energy sector, particularly in the context of electricity generation and energy end-use in the industry and transport sectors. The reason for this is to reduce reliance on fossil fuel imports; tap into domestic renewable energy potential; and achieve key sector-specific sustainable development benefits, such as reducing air pollution and improving labor mobility in the context of the transport sector, and improving

the efficiency and trade competitiveness of the industry sector. Separately, Sri Lanka also recognizes the need to enhance mitigation efforts in the waste sector. This is primarily driven by the municipal solid waste (MSW) management issues across the country, which is a large source of methane emissions. Not only is methane a large contributor to GHG emissions, it also causes serious health concerns such as respiratory distress and heart palpitations. The policy landscape varies significantly across these sectors. For example, the electricity generation subsector is already developing a range of finance and market-related mitigation mechanisms which could support its readiness to participate in CPIs in the future. For example, Sri Lanka is developing a NAMA framework for selected mitigation interventions in the energy sector. The World Bank's CPF is also supporting Sri Lanka in developing a sectoral crediting scheme and a MRV framework for emission reductions from renewable power generation. On the other hand, the transport and waste sectors have primarily used standards and bans as policy instruments³. Key mitigation measures that have already been implemented in the industry sector include the National Green Reporting System (NGRS), which develops and promotes sustainability reporting in the manufacture and service sectors. Sri Lanka's NDC also indicates its plans to introduce other sector-specific plans and policies, such as tax structures to promote sustainable technologies, as well as recognized GHG emissions standard to modernize industries. Projects, such as the Switch Asia Greening Sri Lanka Hotel Project, have also been introduced to raise awareness and provide auditing services to reduce energy, water and resources in specific industries. A key challenge faced by all sectors is the lack of data and analysis to inform and evaluate the development of mitigation measures and also lack of comprehensive and focused policy instruments that incentivize players sufficiently to achieve the mitigation objectives under NDCs. For example, there is currently limited project- and facility-level data and analysis on potential sectoral contribution to emission reduction goals under NDC; no policy analysis of existing mitigation measures; emission reduction gap between NDC goals and existing mitigation measures in key sectors; and potential role and effectiveness of CPIs in addressing policy gaps.

BB2 also analyzes Sri Lanka's existing experience with market-based instruments and other related instruments such as results-based climate finance (RBCF). At the domestic level, Sri Lanka introduced the Sri Lanka Carbon Crediting Scheme (SLCCS) in 2016 as a national voluntary carbon offset scheme. At the international level, Sri Lanka also established the institutional and legal framework for Clean Development Mechanism (CDM) and has seen modest success in CDM project development. While both SLCCS and CDM in Sri Lanka have faced many challenges - such as high administrative costs, low awareness and lack of technical capacity - these schemes offer important lessons to support Sri Lanka's market readiness to enhance the role of market-based instruments in the future. Furthermore, Sri Lanka is also collaborating with international partners on various programs that the PMR could leverage, such as the NAMA and CPF programs for the energy sector mentioned above. Additional analytical work is required to further evaluate the status and challenges of existing schemes to share lessons, explore synergies and avoid overlap.

Building on the first two outputs, BB2 then seeks to inform activities directly under BB4 by exploring the rationale and objectives for developing a new CPI and the need for enhancing and making it more effective the existing SLCCS to support implementation of NDC. For example, not only would enhancing

³ For example, in the transport sector, importation of three wheelers (tuk tuks) with two-stroke engines were banned and Air Emissions, Fuel and Vehicle Importation standards were introduced. In the waste sector, ban of polythene products as well as regulations on waste management practices were introduced.

the effectiveness of the SLCCS build on Sri Lanka's market experience and project-level data collection capacities, it also provides an opportunity to leverage international RBCF in the short and medium run. In the long run, these experiences can also enhance Sri Lanka's readiness to participate in emerging international market mechanisms under the Paris Agreement. Under BB4, Sri Lanka also seeks to explore a new CPI that can complement and enhance the SLCCS. For example, CPIs such as an Emission Trading Scheme (ETS) or carbon tax can use a crediting program as part of a cost containment measure, thereby provide a key source of domestic demand for SLCCS. In this regard, BB2 includes two pieces of analytical work. The first piece involves qualitative analyses and modelling work to identify suitable CPIs based on factors such as mitigation potential, development benefits, and interaction with other policies in the overall policy mix. Building on this analysis, the second piece develops an optimal policy package that would indicate the potential role of a new CPI and how that could further support and enhance SLCCS to support NDC implementation.

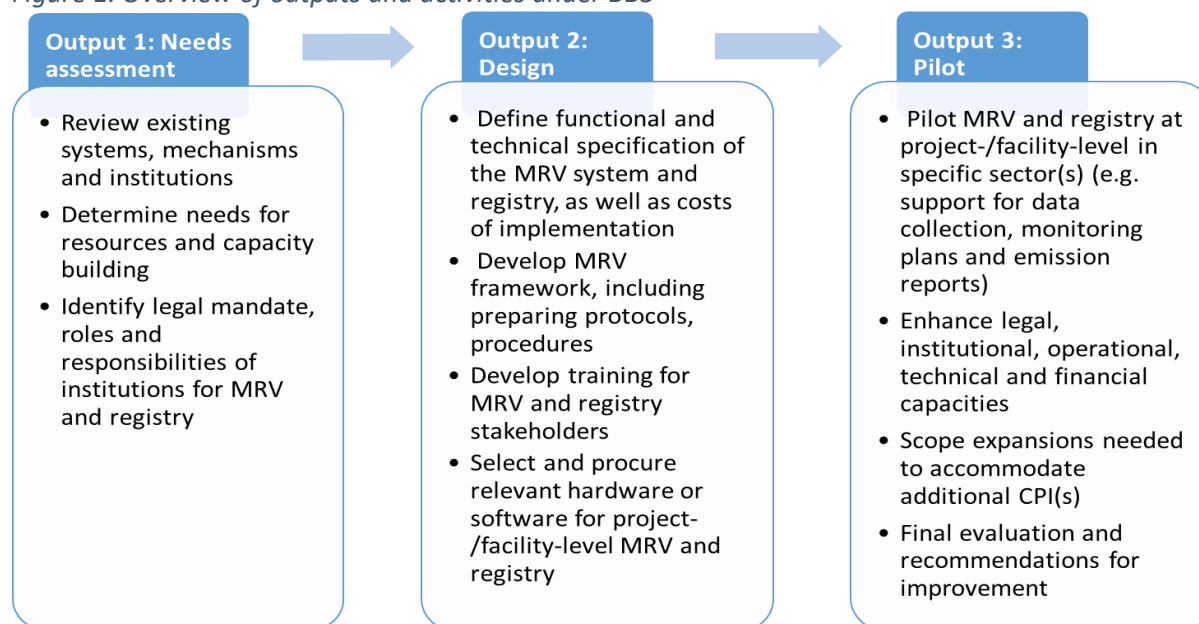
Quantifying GHG emission reductions through a robust MRV framework is an indispensable pre-requisite to the monetization of carbon assets and participation in carbon markets. It also has stand-alone benefits in addition to supporting CPIs, such as reporting and tracking progress towards NDC goals. While Sri Lanka has developed a modest expertise with reporting GHG emissions for national communications, the majority of the MRV expertise is related to the energy sector and is primarily at the project-level, based on its experience with CDM. Sri Lanka recognizes the need to address the current complexities and disaggregation of MRV systems, and build the necessary MRV infrastructures to support emissions and emission reduction profiles in all major sectors; tracking and reporting of NDC implementation progress; and implementation of the nascent SLCCS scheme. Against this backdrop, BB3 aims to build on existing experience and ongoing initiatives to (a) design integrated MRV system that could cover GHG emissions and mitigation actions at the project, program, sector and national level; and (b) implement/pilot the system at the project/facility level.

Considering the above, BB3 supports four core readiness components: (a) enhance data collection systems and capacities, particularly for project-/facility-level data on GHG emissions and emission reduction; (b) establish an integrated national MRV system; (c) develop a registry for data management and/or market transactions; and (d) develop the institutional and regulatory framework to support these systems, including regulations on emissions reporting.

In addition, BB3 seeks to develop a national registry system that is robust and flexible enough to accommodate the enhanced SLCCS and implementation of any new CPI in the future. The proposed registry system would serve two purposes. The first is data management to process, organize and report data on both emissions and mitigation actions, including project-related data. The second function is a transaction registry to facilitate voluntary cancellation of credits and linkage with any new CPI. However, there are several fundamental issues that would need to be assessed during the design phase to determine the most appropriate system for Sri Lanka. For example, the technical, regulatory and institutional requirements of the registry depend on factors such as the scope and scale of CPIs, and domestic and international opportunities to link with other types of CPIs. It is equally important to assess the needs of a registry by mapping out existing systems and capacities. Preliminary analysis under BB3 suggests that the limited registry experience in Sri Lanka varies in terms of technical and institutional specifications. Building on these analyses, BB3 identifies activities needed to enhance legal,

institutional, operational and technical capacities to create an enabling environment for a registry. BB3's activities will be divided into three phases, as detailed in Figure 1 below.

Figure 1. Overview of outputs and activities under BB3



To facilitate smooth implementation of the PMR activities, BB3 would focus in the early stages on foundational issues - such as project-/facility-level data collection and institutional and technical capacity strengthening - which are needed for accounting and reporting purposes, regardless of the CPIs selected.

Building on the analytical work under BB2, BB4 outlines the framework to enhance and scale up the SLCCS and develop a road for implementation of a new selected CPI. A comprehensive strategy would be developed to strengthen the design of the SLCCS. The strategy would be divided into two components. First, the strategy would consider demand and supply-side options to enhance the liquidity of the scheme. On the demand side, short, medium and long term options for domestic demand and may include, for example, voluntary targets set by companies with Corporate Social Responsibility (CSR) goals; any international demand under Article 6 of the Paris Agreement in the medium term; and assessment of additional demand that may come in the future by compliance entities under any another CPI (e.g. ETS or carbon tax) that Sri Lanka may eventually implement. Different sectors may also have different levels of demand for credits, depending on factors such as levels of maturity in emissions reporting and different downstream commercial drivers. International demand, on the other hand, may include both compliance demand (i.e. countries purchasing and transferring mitigation outcomes from Sri Lanka to meet part of their NDC commitments) and funding classified as RBCF. The strategy would also explore options to increase demand by enhancing domestic private sector confidence and engagement with the scheme. This would involve identifying drivers of commercial demand, investigating entities' willingness to pay, and identification of measures (including legislative measures) that could increase private sector confidence in the integrity of the scheme. On the supply side, the strategy would build on the analysis under BB2 to select and prioritize sub-sectors and technology areas that could enhance the supply of credits. This process would consider various criteria, such as total

mitigation potential, feasibility and cost effectiveness, overlap with other CPIs, private sector actors and technical challenges. The work program would then consider approaches for simplifying the methodology and MRV approach for high priority supply sources.

Following the analysis of demand and supply options, the second component of the SLCCS strategy would evaluate the need to modify/develop the institutional, legal and technical framework of SLCCS. To do so, the analysis would first evaluate the extent to which the SLCCS will rely on other international crediting programs to fulfil functions such as developing methodologies and accrediting auditors. Secondly, the strategy would evaluate what institutional functions are required to support the enhanced SLCCS, and how these functions should be allocated across different bodies, particularly in the context of an Executive Body, Administrator and External Auditor. The strategy shall also provide legal recommendations for the composition, mandate and authority of these bodies. Finally, as an input to BB3, the strategy would identify and develop the key requirements for the SLCCS component of the national registry system.

BB4 will also pilot the enhanced SLCCS based on the strategy work completed during MRP implementation. This would involve implementing the recommended institutional and legal frameworks; linking or creating a registry based on the outcomes of BB3; and supporting the development of a pipeline of projects in selected sectors. The piloting process would help strengthen political support and increase private sector interest.

Based on the optimal policy mix recommended under BB2, the second main part of BB4 explores the opportunity to develop a new CPI that could complement the SLCCS and contribute to Sri Lanka's NDC goals. In doing so, it would first conduct a feasibility study to better understand the technical and financial feasibility of the new CPI recommended by BB2. Following this, BB4 would develop a roadmap that details out the plan for development of the main components of the new CPI, including setting the baseline and targets; developing the legal, institutional, operational and technical frameworks; and identifying options for linking with SLCCS, among other things.

Figure 2. Overview of outputs and activities under BB4

Designing a strengthened SLCCS	Designing the institutional, legal and technical framework
<ul style="list-style-type: none"> Identifying new demand for SLCCS (i.e. short, medium and long-term) 	<ul style="list-style-type: none"> Designing institutional structures and capacity building plan Developing simplified rules, procedures and methodological approaches
Piloting the enhanced SLCCS	Developing a roadmap for a new CPI
<ul style="list-style-type: none"> Completed institutional and legal framework (i.e. necessary structures and regulations are in place) Piloting of enhanced SLCCS in selected sector(s) (i.e. development of project pipeline) 	<ul style="list-style-type: none"> Technical and financial study on new CPI Roadmap for developing main components of the new CPI, including possible linking to SLCCS

BB5 outlines the proposed organizational framework for coordinating PMR grant-funded activities. CCS would be responsible for the overall coordination of the MRP and implementation of the BB activities.

Upon the receipt of the PMR grant, Sri Lanka would establish a Project Management Unit (PMU) to lead overall project management, including: adherence to annual work plans; manage and review use of PMR grants; consult and coordinate with relevant policymakers and key stakeholders, among other things. The PMU would be responsible for establishing and coordinating an Inter-Ministerial Project Steering Committee (PSC) to ensure proactive engagement across relevant ministries and departments. The PMU would also establish Advisory Committees (ACs) to provide technical advice and support to the PMU for specific deliverables. ACs will be jointly appointed by the PMU and PSC in the relevant sector(s). ACs could be set up based on thematic groups so that discussions would be tailored towards participants' level understanding of different topics such as MRV, carbon crediting and registries.

BB5 also identifies cross-cutting activities for communication, consultation, capacity building and risk management that could be undertaken during the MRP implementation phase, as listed in Figure 3 below. A detailed list of topics for consultation, communication and capacity building, as well as a workplan for risk management, are identified in BB5.

Figure 3. Overview of cross-cutting activities under BB5

Communication strategy	<ul style="list-style-type: none"> • Develop comprehensive strategies and work plans for general outreach, consultation and capacity building
Stakeholder consultations	<ul style="list-style-type: none"> • Annual workshops; topic-specific workshops; progress reports/quarterly workshops; bilateral interviews; external outreach. Topics to be informed by BB3 and BB4
General outreach	<ul style="list-style-type: none"> • Publications such as policy briefs, press releases; educational workshops and seminars; website
Capacity building	<ul style="list-style-type: none"> • Training workshops; guidance documents; how-to videos; e-learning modules. Topics to be informed by BB3 and BB4
Risk management	<ul style="list-style-type: none"> • M&E reports; risk mitigation strategies

BB6 summarizes the schedule of activities and the proposed budget for each of the activities. Summary of the key outputs from BB2, BB3, BB4 and BB5 are summarized in Figure 4.

Figure 4. Summary of key outputs and activities under BB2, BB3, BB4 and BB5

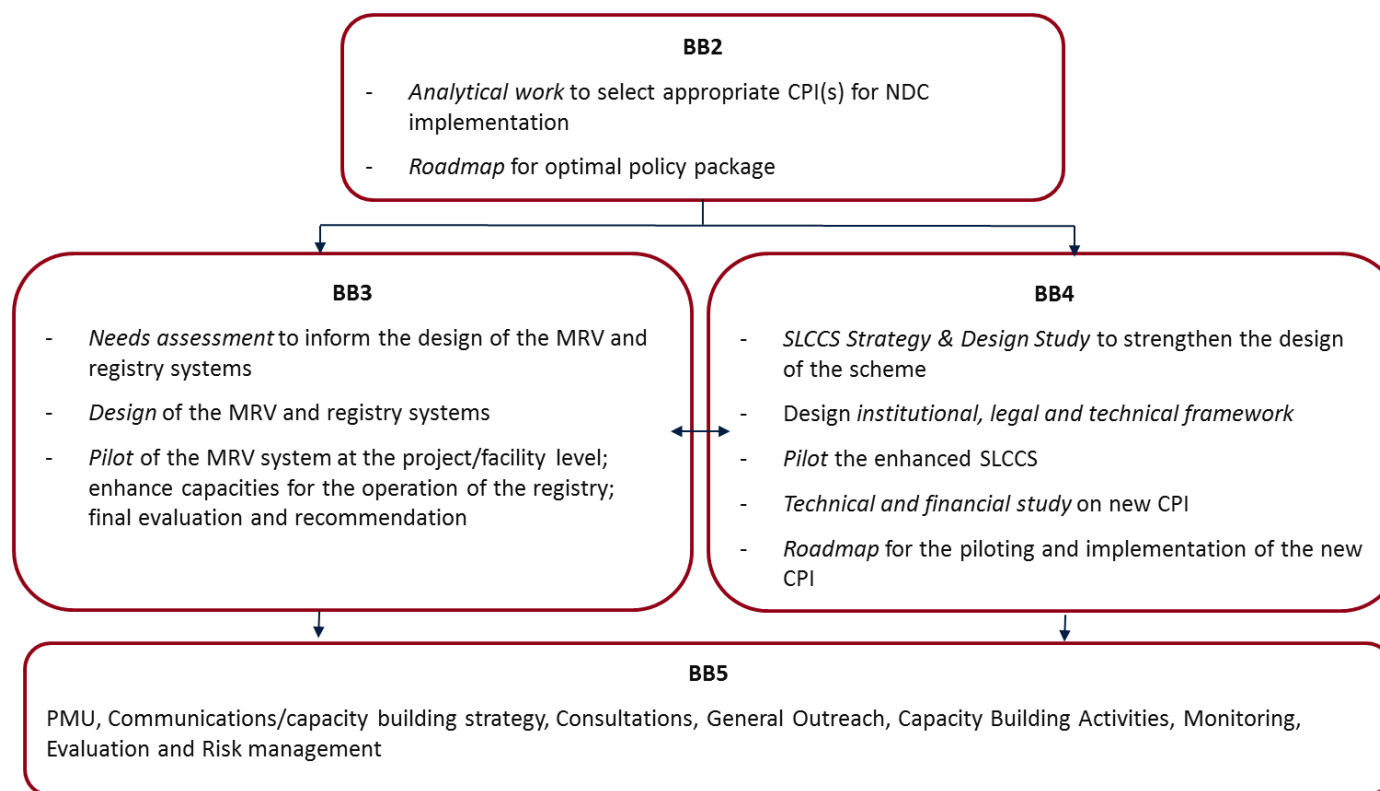


Table 1. Overview of budgets for BB2, BB3, BB4 and BB5

Building Block	Estimated support from PMR (US\$)			Funding source		
	Year 1	Year 2	Year 3	PMR	Govt	Total
BB2	363,500	201,500	0	565,000	56,500	621,500
BB3	335,000	367,500	272,500	975,000	97,500	1,072,500
BB4	135,000	655,000	320,000	1,110,000	111,000	1,221,000
BB5	109,000	132,000	109,000	350,000	35,000	385,000
Total	942,500	1,356,000	701,500	3,000,000	300,000	3,300,000

Table 2. Overview of planned outputs

Output	Description	2018				2019				2020			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
2.1	Assessment of mitigation potential in different sectors and identification of suitable CPI(s) for potential sectors												
2.2	Roadmap for designing and implementing an optimal policy package												
3.1	Needs assessment												
3.2	MRV and registry design												
3.3	Pilot the system												
4.1	SLCCS Strategy & Design Study												
4.2	Designing the institutional, legal and technical framework												
4.3	Piloting the enhanced SLCCS												
4.4	Developing a roadmap for a new CPI												
5.1	Project Management Unit												
5.2	Communication & capacity building strategy												
5.3	Stakeholder consultations												
5.4	General outreach												
5.5	Capacity building												
5.6	Monitoring and evaluation												

1. Building Block 1 – Big Picture: Policy Context

BB 1 is subdivided into three components. The first component provides an overview of Sri Lanka's development objectives, and introduces key national and international climate policies and plans with a specific focus on climate change mitigation. The second component provides a summary of Sri Lanka's GHG emissions trends by sector. The third component maps out the institutional arrangements and decision-making process for climate change policies in four key sectors for climate mitigation, namely the energy, transport, industry and waste sectors.

1.1 Climate change mitigation and development policy objectives

Sri Lanka is a rapidly growing lower middle-income country with a total population of 21.0 million people and per capita income of USD 3,924 in 2015. Following a 30-year civil war that ended in 2009, Sri Lanka is considered to be, in many respects, a development success story. Growth has averaged over 6 % per year in the past decade and poverty rates have declined dramatically from 22% in 2002 to 9% in 2010. Moreover, inequality in per capita consumption expenditure has declined, as reflected by a drop in the Gini coefficient from 0.40 in 2002 to 0.36 in 2010. In 2013, Sri Lanka has achieved 15 out of the 22 Millennium Development Goal (MDG) indicators, notably outperforming the South Asia average.

Nevertheless, the country still faces a number of structural development challenges as it strives to transition to an upper middle-income country. These challenges include the need to boost investment, including in physical and human capital; enhancing the role of private sector; managing an ageing population; preserving natural assets; and providing for resilience to climate change.

Over the last decade, the country has shifted from a predominantly rural-based economy to an urban-based economy geared towards manufacturing and services. The resulting economic growth has led to an increased demand for energy investment and use, which in turn has led to increased air pollution, GHG emissions, and growing economic vulnerability to volatile fossil fuel supplies and prices. Sri Lanka currently spends 50% of its total export income (approximately US\$ 5 billion per year) to import fossil fuels, and over 40% of Sri Lanka's primary energy is dependent on imported fossil fuels, mainly coal, fuel oil and petroleum (Ministry of Power and Renewable Energy, 2015). Given Sri Lanka's heavy dependence on imported fossil fuel to meet growing energy demand, diversifying energy generation away from imported fossil fuels will be critical to improving the country's fiscal and climate resilience.

As a tropical island nation, Sri Lanka recognizes its high vulnerability to the impact of climate change. Not only is the coastal region of Sri Lanka highly susceptible to changes in sea level, climate change will also result in an increase in the frequency and intensity of disasters, especially in drought and flooding. Conservative estimates of the impact of climate change on Sri Lanka's economy indicate a 1.2% loss of annual GDP by 2050 given its direct adverse impact on major economic sectors, such as power, transport, agriculture, water resources and fisheries. Climate change will also likely bring about other intangible negative impacts, such as decline of unique ecosystems (MMDE, 2016 c).

While Sri Lanka takes adaptation measures as a priority given its high vulnerability to climate change, Sri Lanka is committed to contributing to global mitigation efforts. Sri Lanka has put forth two key goals for

climate change mitigation as part of its NDCs for the Paris Agreement under the United Nations Framework Convention on Climate Change (UNFCCC):

- By 2030, reduce GHG emissions in the energy sector against the Business-As-Usual (BAU) scenario by 4% unconditionally and an additional 16% conditionally.
- By 2030, reduce GHG emissions against BAU scenario by 10% in other sectors (transport, forests, industries and waste) by 3% unconditionally and an additional 7% conditionally.

Furthermore, as shown in Table 3 below, Sri Lanka's NDC maps out a comprehensive set of actions that may be taken to achieve emission reductions in five main sectors: energy (specifically focusing on electricity generation), transport, industry, forestry and waste. In terms of timeframe, Sri Lanka plans to achieve its NDC goals from 2021 to 2030, thereby allowing the country to build its readiness for NDC implementation from 2017 to 2020. The Cabinet of Ministers has given approval for the establishment of a Planning and Monitoring Committee, consisting of officials of the Central Government, Provincial Governments, scientists and research groups, to inform the development of strategic policies and implementation plans for each sector included in the NDC. A "Readiness Plan for Implementation of INDCs"⁴ was therefore published by MMDE in 2016 to facilitate the implementation process of NDCs by identifying policy and institutional gaps, as well as technical capacity and resources required to implement the NDCs. The plan was developed in consultation with relevant line Ministries that cover all 14 sectors covered by the NDCs, including those related to loss and damage. The plan may be updated in the future, depending on availability of updated data from each sector.

Table 3. Sri Lanka's key mitigation goals

Energy sector

1. Establishment of: large scale wind power plants of 514 MW; 115 MW of solar power plants; 105 MW of biomass power plants; 176 MW of mini hydro power plants.
2. Introduction of Demand-Side Management (DSM) activities.
3. Strengthen renewable energy from the existing 50% to 60% in 2020.
4. Converting existing fuel oil based power plants to LNG.

Transport sector

1. Establish energy efficient and environmentally sustainable transport systems by 2030.
2. Upgrade of Fuel Quality Standards (FQS) to reduce harmful emissions that cause environmental pollution and health hazards.
3. Reduce unproductive transport systems from current usage.
4. Shift passengers from private to public transport modes.
5. Enhance the efficiency and quality of public transport modes.
6. Reduction of GHG emissions in the maritime sector.
7. Gazette new emission standards to reduce GHG emissions.
8. Encourage and introduce low emission vehicles such as electric and hybrid.
9. Reduce traffic congestion in order to reduce GHG emission.
10. Reduction of GHG emissions in the aviation sector.
11. Establishment of a database management system for monitoring NDCs of transport sector.

⁴ http://www.climatechange.lk/Publications_2016/Readiness%20Plan%20For%20INDCS%20In%20Sri%20Lanka.pdf

Industry sector

1. Modernizing and facilitating industries to follow recognized standards related to GHG emission reduction (Environmental Management System such as ISO 14000, ISO 14040 series, ISO 14062 - Design for Environment, ISO 14064 - Greenhouse emission, standards co-Tex 1000 garment and textile industry, Hazard Account Critical Control Points (HACCP) or ISO 22000/25 certification etc.)
2. Continue fuel switching to biomass in industries.
3. Improve efficiency of industrial energy/water/ raw materials.
4. Introduce and promote tax structures to promote the sustainable technologies.
5. Encourage industries to reduce GHG emissions through introduction of a rewards' system.
6. Establish Eco-industrial Parks and villages.
7. Implement the National Green Reporting System of Sri Lanka.
8. Apply eco-efficient and cleaner production.
9. Greening the supply chain through introducing the life cycle management and industrial symbiosis to maintain zero waste.
10. Introduce high efficient motors for the entire industrial sector.

Forestry sector

1. Increase the forest cover of Sri Lanka from 29% to 32% by 2030.
2. Improve quality of growing stock of natural forests and forest plantations.
3. Restoring degraded forests and hilltops (shrubs, grasslands and state lands)
4. Increase river basin management for major rivers of Sri Lanka.
5. Forestation of underutilized private lands and marginal Tea lands.
6. Urban forestry (roadside planting, urban parks and other state lands).
7. Establish a functional National Forest Monitoring System.
8. Promote investment of private and public-sector companies in environmental conservation projects through CSR programs.

Waste sector

1. Introducing a source separation system at the household level and a proper collection mechanism.
2. Improving the compost preparation system for each local authority and increasing the supply of organic fertilizer to agricultural purposes by providing facilities to control quality of compost and introduce a market for the compost fertilizer production.
3. Introducing energy generation by waste (waste to energy programs).
4. Improving the waste collection mechanism.
5. Designing and implementing comprehensive solid waste management strategies for 40% to 60% of LAs before 2030.
6. Monitoring of waste management activities.
7. Systematic management of industrial/hazardous and clinical waste management.

(Source: MMDE, 2016 a)

Moving forward, it is envisioned that activities under the PMR can help build Sri Lanka's readiness to implement its NDC, by: (a) conducting analytical work to design an optimal policy package for NDC implementation; (b) developing supporting systems such as the MRV framework and registries that would enhance the transparency of Sri Lanka's mitigation efforts and form the backbone of the selected

CPI(s); (c) strengthening the implementation of the existing domestic carbon offset scheme, SLCCS, to achieve cost-effective emissions; and (d) identifying the potential role for new CPI, including developing a roadmap for its pilot and implementation.

As Sri Lanka aspires to become a higher middle-income country, a key objective is to identify mitigation actions and policies that can simultaneously address climate change, while balancing the country's other development challenges, such as volatile economic growth, food security, and maintaining trade and industrial development. In this context, Sri Lanka's **National Climate Change Policy** was developed in 2012 to highlight the country's most pressing climate concerns and outlines several principles that should be considered when developing actions in NDC priority sectors such as energy, transport, industry, waste management, as well as other sectors, such as agriculture and livestock.

Separately, the MMDE introduced the **Sri Lanka NEXT - A Blue Green Era** in 2016 to support a "blue-green" development strategy to help Sri Lanka sustainably manage its vast marine resources, whilst identifying actions for low carbon development in key sectors. "Blue development" strategy involves enhancing offshore wind and oceanic thermal energy conversation; sustainable utilization of oceanic fish and other marine biological resources; explore oceanic mineral resources. "Green" development involves scaling up green energy generation; sustainable agriculture; green buildings and transport; and eco-friendly industrial production.

1.2 Overview of the composition of Sri Lanka's emissions

Sri Lanka's GHG emission in 2012 was approximately 0.78 tCO₂ per capita, far below the world average value of 4.44 tCO₂ per capita. Furthermore, Sri Lanka's total GHG emission in 2013 was 42.83 MtCO₂e, which represented less than 0.1% of global emissions (World Resources Institute, 2017).

According to Sri Lanka's Second National Communication (SNC) on Climate Change submission to UNFCCC⁵, Carbon Dioxide (CO₂) emissions have shown the highest contribution to climate change, representing 58% of total GHG emissions in 2000. This is followed by Methane (CH₄) and Nitrous Oxide (N₂O), which contribute to 36% and 6% of emissions in 2000 respectively.

Table 2 below maps out the sector distribution of CO₂, CH₄ and N₂O emissions in CO₂e in year 2000. The energy sector, which accounted for 61.4% of total national emissions in 2000, represented the largest share of total national GHG emissions. The agriculture sector was the second highest GHG emitter, and represented 25% of total emissions. This was followed by the waste sector (10.8%) and the industrial processes (2.6%).

⁵ <http://unfccc.int/resource/docs/natc/lkanc2.pdf>

Table 4. Breakdown of GHG emissions by sector

Sector	GgCO ₂ e in year 2000 (CO ₂ , CH ₄ and N ₂ O)	%
Energy	11,562	61.4%
Industry	492	2.6%
Agriculture	4,709	25.0%
Land Use Change & Forestry	45	0.2%
Waste	2,033	10.8%

Source: Ministry of Environment and Renewable Energy (2011)

BB2 provides further details on the composition of emissions and emission trends for the four sectors, which are identified as priority areas for mitigation actions under Sri Lanka's NDC, namely: energy (electricity generation), transport, industry and waste. Emissions from Agriculture, Forestry and Other Land Use (AFOLU) sectors are not discussed since these sectors are not a major focus of PMR support.

1.3 Review of institutional framework for climate change mitigation

Sri Lanka has been actively involved in international climate negotiations since an early stage. For example, Sri Lanka is Party to key international agreements, such as the ratification of the UNFCCC in 1992 and the Kyoto Protocol in 2002. In 2015, Sri Lanka has also actively participated in two landmark agreements: The UNFCCC's Paris Agreement in December and the Sustainable Development Goals (SDG) in September. As mentioned in section 1.1, Sri Lanka's main contribution to mitigation are illustrated in its NDCs as follows:

- By 2030, reduce GHG emissions in the energy sector against BAU scenario by 4% unconditionally and an additional 16% conditionally.
- By 2030, reduce GHG emissions against BAU scenario by 10% in other sectors by 3% unconditionally and an additional 7% conditionally.

The National Council for Sustainable Development (NCSD) was established in 2009 to develop and implement strategic plans for sustainable development. The NCSD is chaired by the President to ensure political commitment to harmonize economic growth and environmental sustainability; while the **MMDE** serves as the Secretariat (ASIALEDS Partnership, 2017).

The **CCS under the MMDE** was established in 2008 to act as the national focal point to the UNFCCC. The Secretariat also serves as a platform for addressing climate change issues at the national level, and is responsible for developing relevant policies and programs; liaising with sectoral agencies to identify priorities and implementation mechanisms; and monitoring impacts of national climate responses.

As part of CCS's remit to enhance stakeholder engagement in the climate policy-making process, three committees were established to inform the integration of climate change adaptation and mitigation into relevant sectoral policies, strategies and action plans. These cross functional committees include the following:

- **The Inter-Agency Committee on Climate Change** is a coordinating body made up of members of line ministries and line agencies, designed to ensure climate-related policies are aligned with the

national development agenda, and also to guide policy makers on how to integrate international & national climate adaptation and mitigation into relevant policies and strategies. Along with this committee, two cross-sectoral, technical sub committees were also established.

- The **National Expert Committee on Climate Change Mitigation** was set up in 2012 to provide guidance in the development of climate mitigation policies, legal instruments and action plans to address climate change as discussed under the international climate change negotiations. The committee was also tasked with supporting the preparation of the national greenhouse gas inventory, and guiding the implementation of NAMAs, CDM and other similar mechanisms.
- The **National Expert Committee on Climate Change Adaptation** was set up in 2014 to raise Ministries' awareness of the country's vulnerability to climate change and to inform policies, strategies and action plans to avoid/minimize adverse impacts of climate change to people, livelihoods and ecosystems.

Furthermore, the **Sri Lanka Climate Fund (SLCF)** (formerly known as Sri Lanka Carbon Fund) was established in 2009 to catalyze private investment for mitigation and adaptation projects; build local capacity to access international climate finance; and facilitate carbon trading at the national and international level. While SLCF encourages public-private partnerships, it is wholly owned by the Government and is closely coordinated with MMDE and other related governmental departments. One of SLCF's main priorities to date has been to scale up project-based crediting, such as under the CDM by, for example, providing technical and financial assistance to project developers for the preparation of project documents and bundling of small CDM projects.

Finally, the **Central Environmental Authority (CEA)** is responsible for specifying environmental standards, as well as coordinating/carrying out reports related to the environmental management of natural resources, fisheries, wildlife, forestry and soil conservation. In accordance with the environmental protection standards and other criteria set out by CEA, sectoral agencies are required to submit an environmental impact assessment report to ensure that environmental considerations are integrated into policies and plans (CEA, 2000).

1.3.1 Institutional arrangements in the energy sector

The **Ministry of Power and Renewable Energy**'s mandate includes, among others: formulating energy-related policies, programs and projects; promoting rural electrification; developing renewable energy; managing demand to ensure energy efficiency. The Ministry is supported by the CEA, which is responsible for ensuring the environmental integrity of policies and actions in the country including the energy sector.

Furthermore, since emission reduction in the energy sector is a key component in Sri Lanka, the **Sri Lanka Sustainable Energy Authority (SLSEA)** was established in 2007, under the purview of Ministry of Power and Renewable Energy, to help recognize the mitigation potential in the energy sector by scaling up renewable energy capacity; promoting energy efficiency and ensuring cost-effective energy delivery and data management. In this context, the SLSEA's main responsibilities include, among others: identifying, conserving and managing all renewable energy resources; preparing, maintaining and updating an inventory of all renewable energy resources; and assisting the development and guidance for energy policies in collaboration with the relevant State Agencies.

Since 2002, the power sector in Sri Lanka has been regulated by the **Public Utilities Commission of Sri Lanka (PUCSL)**. As an independent regulatory body, PUCSL works within the policy framework established by the Ministry of Power and Renewable Energy (Energy Forum , 2012). PUCSL regulates the distribution, supply and use of electricity; and seeks to ensure that the electricity sector has efficient supply and improved quality of service for electricity consumers. On the other hand, the **Ceylon Electricity Board (CEB)**, which is a state-owned utility firm, is mandated to develop and maintain an efficient, coordinated and economical system for the electricity sector, in accordance with any License issued. CEB is responsible for most of the generation and distribution licensee while being the sole licensee for transmission.

1.3.2 Institutional arrangements in the transport sector

The institutional arrangements for the transport sector is relatively fragmented and are spread over several ministries and agencies (Kumarage, 2011). The **Ministry of Transport** is responsible for developing policies, programs and projects in the transport sector including the road, rail, air and marine transport sub-sectors. It monitors and evaluates actions under Department of Sri Lanka Railways; Sri Lanka Central Transport Board; National Transport Medical Institute; Department of Motor Traffic; National Transport Commission and Civil Aviation Authority. On the other hand, the **Ministry of Higher Education and Highways** is responsible for the adoption of measures necessary for the improvement and maintenance of the national highway system (MMDE and UNDP, 2016). The **Ministry of Provincial Councils and Local Government** is responsible for monitoring and evaluating policies and actions subject to provincial councils and local governments, and is currently managing a number of projects in the road sector (Ministry of Provincial Councils and Local Government , 2017) (see BB2 for further details). Other cross-cutting governmental bodies are also involved in specific aspects of Sri Lanka's transport policies. For example, the **CEA** is responsible for ensuring effective air quality management, including in the transport sector; while the **Ministry of Power and Renewable Energy** promotes the use of clean energy and alternative fuels use like bio-diesel.

1.3.3 Institutional arrangements in the industry sector

National Cleaner Production Centre under the **Ministry of Industry and Commerce** provides technical assistance to industries to operate more efficiently and sustainably. To achieve this goal, National Cleaner Production Centre supports a range of capacity building activities; and conducts a comprehensive set of energy, waste, water audits and sustainability assessments to identify opportunities for sustainable development in industries (National Cleaner Production Centre , 2017). On the other hand, emissions related to energy use in the industry sector are managed by the **Ministry of Power and Renewable Energy**. SLSEA within the Ministry plays an important role in supporting the design and implementation of energy efficiency and conservation targets and activities for the industry sector.

1.3.4 Institutional arrangements in the waste sector

CEA is responsible for monitoring and coordinating all regulatory activities related to discharge of waste and pollutants which may have an adverse impact on the environment. Following the guidelines set by CEA, **Local Authorities** are responsible for municipal waste management, which is the main source of

waste in Sri Lanka. However, the capacity of Local Authorities in general is not sufficient to manage all the waste generated in their region. Only 40% of the waste is regularly collected and only limited number of Local Authorities run sanitary land filling practices at present (MMDE, 2016 a) The **Ministry of Provincial Councils and Local Government** established the **National Solid Waste Management Support Centre** to support and monitor Local Authorities' solid waste management activities (Ministry of Provincial Councils and Local Government , n.d.). The Centre's main responsibilities include, among others: providing manuals and guidelines; providing technical assistance to local authorities; and collecting data and evaluating regions' relative performance in waste management.

1.3.5 Concluding remarks

Despite Sri Lanka's relatively small contribution to global GHG emissions to date, scaling up mitigation efforts will be increasingly important to curb expected emissions growth and ensure sustainable development as the country strives towards becoming a higher-middle income country. In light of Sri Lanka's NDC, it has been proposed that PMR could primarily support mitigation efforts in the energy sector (particularly in the electricity, transport and industry sub-sectors) and the waste sector. Mitigation policies and actions in these sectors are also expected to bring about important sustainable development benefits, such as reducing reliance on fossil fuel imports in the energy sector, and reducing health hazards in the waste sector.

Sri Lanka has shown strong commitment at the policy level to address climate change mitigation. Not only is the MMDE headed by His Excellency President of Sri Lanka, the government has also introduced a number of institutions at the national level (e.g. CCS and SLCF) and sector level (e.g. SLSEA) that focus specifically on enhancing actions on climate change. As indicated in the NDC, however, Sri Lanka faces challenges at the implementation and institutional stage, such as lack of capacity to collect data to monitor and evaluate existing policy arrangements as well as lack of finance to scale up ambition. Table 5 provides an overview of the institutional arrangements for climate change mitigation policies in the sectors/sub-sectors supported by PMR, namely energy, transport, industry and waste. Currently, one of the major challenge is the lack of institutional coordination required to implement mitigation measures. Sri Lanka's NDC therefore recognizes the need to set up an appropriate institutional mechanism to ensure that relevant sectoral ministries and key stakeholders (e.g. in the private sector and academia) are consulted in the design and implementation of mitigation policies. BB5 provides further details on how PMR can support cross-cutting and thematic-specific consultation, communication and capacity building efforts.

Table 5. Overview of institutional arrangements for climate change mitigation policies

Cross-cutting	
CCS under MMDE	Acts as the national focal point to the UNFCCC and manages Sri Lanka's climate change policies and actions at the national level in coordination with sectoral agencies.
SLCF under MMDE	SLCF encourages private-public partnerships, builds local capacity to access international climate finance, and facilitates carbon trading at the national and international level.
CEA	Specifies environmental standards, and coordinates or conducts reports and activities related to environmental management of natural resources, fisheries, wildlife, forestry and soil conservation.

NCS	Chaired by the president and aims to provide high-level policy guidance to ensure the integration of environmental/climate concerns into Sri Lanka's economic and social development.
Energy sector	
SLSEA under the Ministry of Power and Renewable Energy	Identifies and manages all renewable energy resources; promotes energy efficiency; and assists the development and guidance for sustainable energy policies in collaboration with relevant agencies.
PUCSL	An independent regulatory body which regulates the generation, transmission, distribution, supply and use of electricity.
CEB	A state-owned utility firm which is mandated to develop and maintain an efficient, coordinated and economical system for the electricity sector. It is responsible for most of the generation and distribution licensee, and is the sole licensee for transmission.
Transport sector	
Ministry of Transport	Formulates policies, programs and projects in the transport sector, including in the road, rail, air and marine transport sub-sectors.
Ministry of Higher Education and Highways	Formulates measures necessary for the improvement and maintenance of the national highway system
Ministry of Provincial Councils and Local Government	Formulates projects and measures in the transport sector (mainly road) that are subject to Provincial Councils and Local Authorities
Ministry of Power and Renewable Energy	Formulates cross-cutting policies that includes energy efficiency and conservation targets and activities for the transport sector.
Industry sector	
National Cleaner Production Centre under the Ministry of Industry and Commerce	Provides technical assistance to industries to operate more efficiently and sustainably; and conducts a comprehensive set of energy, waste, water audits and sustainability assessments in order to identify opportunities for sustainable development in industries
Ministry of Power and Renewable Energy	Formulates cross-cutting policies that includes energy efficiency and conservation targets and activities for the industry sector
Waste sector	
Local Authorities	Responsible for municipal waste management, which is the main source of waste in Sri Lanka
National Solid Waste Management Support Centre under the Ministry of Provincial Councils and Local Government	Provides manuals and guidelines, as well as technical assistance to local authorities. Collect data and evaluate regions' relative performance in waste management

2. Building Block 2 – Mitigation Policy Objectives, Landscape and Options Analysis

The purpose of BB2 is to identify preparatory work and readiness activities required to provide a clear rationale and context for supporting the proposed activities under PMR. The primary objectives of these PMR-supported activities are to (a) evaluate the effectiveness of existing mitigation policies; (b) identify the need for new policy instruments (both carbon pricing and non-carbon pricing) to address gaps in the current policy landscape; (c) understand the potential interaction between new and existing policies; and (d) inform the development of an optimal policy package. In this context, this section is divided into two key components. Section 2.1 aims to preliminarily map out the emission reduction potential, objectives, and policy landscape of four priority sectors as identified in Sri Lanka's NDC (see BB1), namely energy (with a specific focus on electricity generation), transport, industry and waste. Section 2.2 provides a deep dive into the status, achievements and challenges of existing market-based instruments and other mechanisms that could build Sri Lanka's readiness to participate in CPIs in the future.

2.1 Mitigation potential, objectives and policy landscape by sectors

As mentioned in BB1, there are two main mitigation goals under Sri Lanka's NDC. For the energy sector, the 20% reduction includes both unconditional (4%) and conditional (additional 16%) components. For other sectors, there is a goal of 10% reduction versus BAU that also includes both unconditional (3%) and conditional (additional 7%) components. The NDC further specifies that the energy goal is based on BAU emissions of 196,915 GgCO₂e over 2020 to 2030, so a 20% reduction is estimated to be 39,383 GgCO₂e. No projections for other sectors are provided in the NDC.

An overall understanding of the emissions trends, as well as the policy and institutional context is critical to find a gap and ensure that the proposed CPIs can adequately support the implementation of these NDC goals. Against this backdrop, part 1 of BB2 aims to preliminarily analyze the mitigation potential, objectives, and policy landscape in the energy, transport, industry and waste sectors, with a specific focus on:

- (a) **The composition of emission and emission trend** to identify underlying factors driving emission growth; and preliminarily identify potential sub-sectors, technological areas and/or regions with high mitigation potential.
- (b) **Existing mitigation strategies and policies** to evaluate sectors' overall commitment, strategy and policy instruments to address climate change mitigation
- (c) **Barriers for implementation of mitigation measures, including for CPIs** to explore how PMR-supported activities can address these challenges.

2.1.1 Energy sector

2.1.1.1 Composition of emissions and emission trends in the energy sector

As mentioned in BB1, the energy sector accounted for 61.4% of total national GHG emissions in 2000 (Ministry of Environment and Renewable Energy, 2011). According to Sri Lanka's SNC to the UNFCCC, the total GHG emission for the energy sector (both energy and end-use sector) nearly doubled from 5,447 in 1994 to 10,430 GgCO₂e in 2000 (SLSEA, 2016). Within the energy and energy end-use sector, 44% of emissions were from transport, and 26.6% were accounted for by the electricity industry. The

household/commercial sector accounted for about 18.8 % of the emissions. This is followed by the industry sector (8.3%) and refinery sector (2.3%).

Table 6. Breakdown of GHG emissions in the energy and energy end-use sectors in 2000

Energy and Energy End Use Sector	GgCO ₂ e in year 2000 (CO ₂ , CH ₄ , N ₂ O)	%
Fuel combustion	11,562	100%
Electricity	3,076	26.6%
Industry	955	8.3%
Transport	5,084	44.0%
Household and Commercial	2,177	18.8%
Refinery	268	2.3%

As shown in Table 7 below, biomass and petroleum represent the highest share of total primary energy supply (TPES)⁶, each accounting for 39% of TPES in 2015 (SLSEA, 2015 b). While burning biomass is carbon neutral in principle, the energy could still have a net contribution to GHG emissions if there are insufficient reforestation and afforestation activities in place. As shown in Figure 5, while the demand for biomass has fallen since 1975, this has mainly been replaced by importing a dirtier fossil fuel source, petroleum.

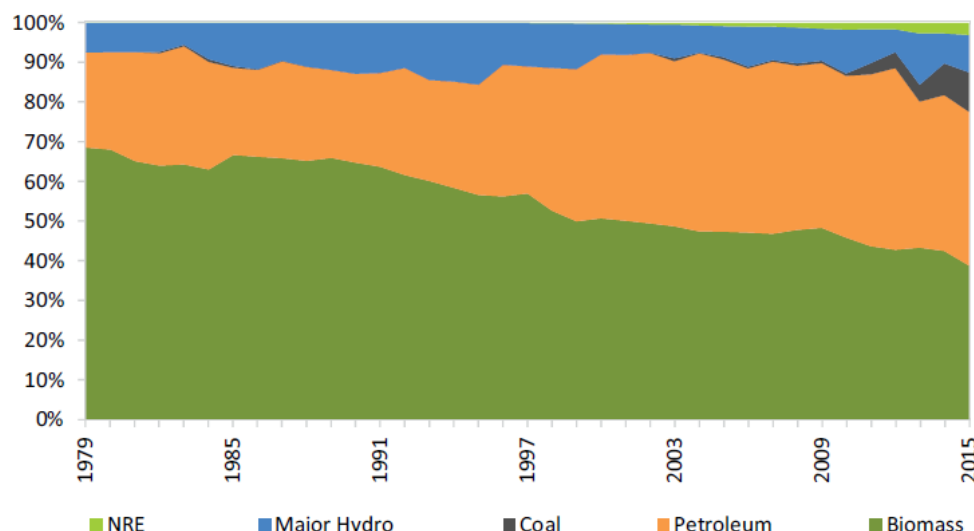
Table 7. Breakdown of total primary energy supply (TPES) from 2011 to 2015

	2011		2012		2013		2014		2015	
	Thousand Toe	%	Thousand Toe	%	Thousand Toe	%	Thousand Toe	%	Thousand Toe	%
Biomass	4944.387	44%	4861.6914	43%	4814.3298	43%	4911.1846	42%	4830.48069	39%
Petroleum	4914.809	43%	5219.592	46%	4114.4303	37%	4556.84	39%	4839.96705	39%
Hydro	964.241	9%	654.413	6%	1442.4238	13%	875.933	8%	1177.0584	9%
Coal	323.958	3%	455.9016	4%	479.6971	4%	920.6537	8%	1238.952	10%
NCRE	178.364	2%	180.63	2%	286.6794	3%	301.166	3%	366.18362	3%
TPES	11325.76		11372.23		11137.56		11565.78		12452.64	

Source: SLSEA, 2015

⁶ TPES indicates the sum of indigenous production and imports subtracting international marine/aviation bunkers and stock changes. This is different from power supply and includes coal, crude oil, natural gas liquids, refinery feedstocks, additives, petroleum products, gases, combustible renewables and waste, electricity and heat.

Figure 5. Breakdown of TPES from 1979 to 2015



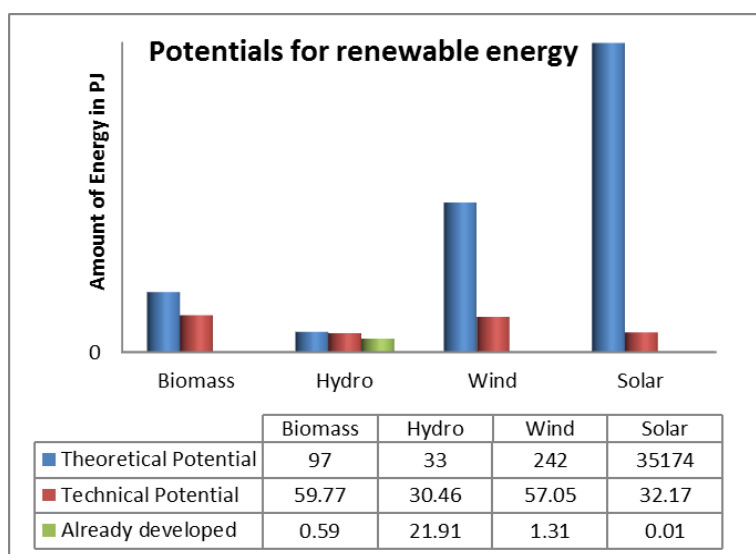
Source: SLSEA, 2015b

The following observations may be made about the source, trend and GHG emission contribution of key energy types in Sri Lanka:

Fossil fuel: the country has no domestic production of coal, petroleum or natural gas, and as a result, the fossil fuel demand is met entirely through imports. Close to 40% of energy demand is met by fossil fuel demand; and the cost incurred from fossil fuel imports are significant, covering approximately 50% of Sri Lanka's export income. Though CEB's Long Term Generation Expansion Plan (CEB, 2015) identifies coal as the low-cost option in the country, expected increase in electricity demand suggests that a push towards non-conventional renewable energy sources and potential use of natural gas to balance the grid will be an important strategy to curb rising GHG emissions in the electricity sector.

Renewable energy: Most of the country's large hydropower resources have already been developed. A major constraint in developing the remaining hydro power available are related to social and environmental impacts associated with large-scale hydropower plants (e.g. displacement of local communities, biodiversity concerns). As shown in Figure 6 below, Sri Lanka has large untapped potential from non-conventional renewable energy (NCRE) sources, particularly in wind and solar. However, full exploitation of wind and solar resources is delayed, in view of severe constraints imposed by the quality of grid, and energy demand profile of the country (SLSEA, 2016)

Figure 6. Potential for renewable energy

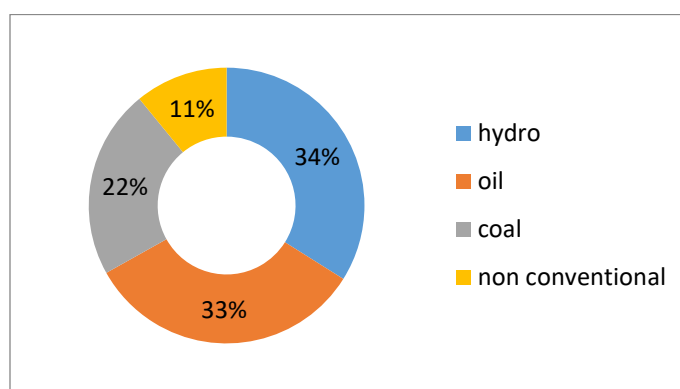


(Source: Ministry of Power and Renewable Energy, 2015)

Apart from the NDC target related to the “introduction DSM activities”, most NDC goals in the energy sector relate to electricity generation (see Table 3). The remainder of this section therefore takes a closer look at the source, trends and emission contribution of the electricity generation sector specifically in Sri Lanka. Mitigation actions in energy end-use, on the other hand, is primarily discussed in section 2.1.2 and 2.1.3, since Sri Lanka’s industry and transport NDC prioritizes several energy-efficiency/demand-side management activities.

Electricity remains the main secondary energy source in Sri Lanka. Present level of national grid electrification coverage is high at around 98% in 2014, which is commendable by South Asian standards (CEB, 2015). In addition, off-grid community and household installations are also supplying electricity, thus reducing the share of un-electrified households to very low levels in comparison with other countries in the region (SLSEA, 2016). The share of households with no grid access have decreased substantially from 71% in 1990, to 35% in 2002, and only 4% by 2013.

Current total installed power generation capacity in Sri Lanka is approximately 4,050 MW, consisting of 900 MW of coal power; 1,335 MW of oil burning thermal power; 1,375 MW of hydropower; and 422 MW of NCRE sources such as wind, mini hydro, biomass and solar power plants as depicted in Figure 7 below.

Figure 7. Installed capacities of different energy sources

Source: Ministry of Power & Energy, 2015

Annual electricity demand is 10,500 GWh, 38% of which comes from domestic consumers, 39% from industrial users, 20% from commercial enterprises and the remaining from other uses such as street lighting. As the country aspires to become a high-middle income country, the electricity sector's contribution to GHG emissions in the future is therefore expected to significantly increase, given the higher expected annual growth rate of about 7 to 8% (SLSEA, 2016) and increased reliance on fossil fuel-based thermal power plants. There is therefore an urgent need to diversify the energy mix to reduce expected emissions growth and reduce dependence on fossil fuel imports.

2.1.1.2 Existing mitigation strategies and policies in the energy sector

As indicated in the NDC (see BB1 for further details), the majority of Sri Lanka's emission reduction efforts will take place in the energy sector, especially the electricity generation sub-sector. In particular, as part of its NDC, Sri Lanka has committed to increasing renewable energy's share in its total generation mix, introducing DSM activities; and converting existing fuel oil based power plants to LNG.

At the national level, Sri Lanka has already institutionalized an array of mitigation strategies and policy instruments to reduce emissions through scaling up renewable energy investments and promoting energy efficiency. This includes sector-specific strategies, such as the Ministry of Power and Renewable Energy's **Energy Development Plan for a Knowledge-based Economy**, which was introduced in 2015 to become energy self-sufficient by 2030; reduce annual energy demand growth by 2% through conservation and efficient use; and increase the share of electricity generation from renewable energy sources (conventional and non-conventional) to 60% by 2020. The plan identifies eight strategic areas, including among others, the need to integrate national energy policy formulation, improve energy efficiency, and develop innovative financing for the energy sector. Separately, the Ministry of Power and Renewable Energy is currently developing the **National Energy Policy & Strategy**. The strategy sets out several targets, such as the need to prepare long-term electrification plan annually, and ensure that 10% of electricity energy supplied to the grid is from NCRE. Strategic areas include, the need to promote energy efficiency through SLSEA, introduce green funding including CDM to promote NCRE and adopting an appropriate pricing policy through PUCSL.

On the other hand, the energy sector is covered by a number of cross-cutting policies and plans as well, such as the **National Climate Change Policy** and **Sri Lanka Strategy for Sustainable Development**, as mentioned in BB1. There are also regional-specific plans, such as the **Western Region Megapolis Master**

Plan which was introduced by the Ministry of Megapolis & Western Development in 2015 to guide all aspects of sustainable development for the entire western region.

Sri Lanka has also implemented a number of policy instruments, programs and projects to help achieve these targets and plans:

- **Feed-in tariff (FIT):** FIT is an energy supply policy that typically guarantee RE generators specified minimum payments per unit (e.g. USD/kWh) over a fixed period. Sri Lanka introduced the FIT in the early 1990s with the purpose of creating an enabling environment to promote renewable energy technologies (Energy Forum , 2012). The FIT introduced is for power plants with capacities less than 10 MW and the potential sites are allocated based on a first come first serve basis to private sector firms. Investors that plan to establish a power plant in the range of 10 MW to 25 MW can submit a proposal and negotiate a tariff less than the announced FIT.
- **CPF:** The World Bank's CPF is supporting the CEB in developing a sectoral crediting program, as well as a methodology to monitor, report and verify the generation of emission reduction from the expansion of renewable power which includes wind, solar and biomass plants. This program is expected to support efforts to increase the share of renewable energy generation by developing appropriate methodologies and MRV systems to mobilize RBCF. Please refer to section 2.2.4 for further information.
- **Sustainable Guarantee Facility (SGF):** SLSEA established the SGF (previously known as the Sri Lanka Sustainable Energy Fund) to provide technical and financial guarantees for the promotion of energy efficiency. This guarantee aims to serve to lower the cost of financing for borrowers and encourage the pursuit of energy efficiency projects (USAID, 2006) .
- **NAMA in the energy generation and end-use sector ("Energy NAMA"):** SLSEA and the United Nations Development Program (UNDP) are currently developing an inventory and MRV framework for energy generation and end-use sectors as part of the NAMA. Please refer to section 2.2.3 for further information.
- **CDM:** According to the UNEP DTU CDM Pipeline, all of the 20 registered CDM projects in Sri Lanka are in the energy sector, of which 12 are hydropower projects.
- **SLCCS:** SLCCS is a nascent national voluntary carbon offset scheme launched in 2016 that has been initially executed by the SLCF. Sri Lanka Certified Emission Reductions (SCERs) can be issued to domestic low carbon projects for trading in the domestic market. So far, only three projects are registered, all of which are small scale hydropower projects. Please refer to section 2.2.1 for further information.
- **Soorya Bala Sangramaya (Battle for Solar Energy):** The Ministry of Power and Renewable Energy has launched a new community-based power generation program in collaboration with SLSEA, CEB and Lanka Electricity Company (Private) Limited (LECO) to promote the setting up of small solar power plants on the rooftop of households, religious places, hotel, commercial establishments and industries. It is expected to add 200 MW of solar electricity to the national grid by 2020 and 1000 MW by 2025. Under this program, consumers have three options to select from: (a) Net Metering, where consumers only pay for the net used amount of electricity from the solar rooftop system. If the solar electricity production exceeds the electricity consumption of the premises, the net balance can be carried forward for future use. (b) Net Accounting, which pays consumers for the excess electricity generation from the solar rooftop

system; (c) Net Plus, where the total electricity generation from the solar rooftop system would be purchased by the utility.

2.1.1.3 Barriers for implementation of mitigation measures, including CPI(s)

General barriers for implementing mitigation measures to promote renewable energy and energy efficiency (SLSEA, 2016) include:

- **Technical and structural barriers:** Lack of pilot projects to demonstrate proof of concept to generate strong private sector buy in; poor grid condition (or complete unavailability of the grid) leads to higher costs, and delay in development in certain NCRE, such as solar and wind energy; poor supply-demand value chains; poor reliability of technology and lack of R&D support; and lack of technical capacity and awareness among end users to promote energy efficiency; technical capacity to design, manage and operate renewable energy projects
- **Financial barriers:** Perceived payment risk; financial risk (including high interest rate, upfront cost, lack of collateral, exchange rate fluctuation, and high transaction cost); lack of risk mitigation tools; and inadequate financing support (such as grants, loans, grace periods, long term interest rates etc.).
- **Information barriers:** Relatively low priority for renewable energy and energy efficiency support in national strategic planning, given the need to prioritize other development objectives as the country aspires to become a high middle-income country; lack of knowledge on availability of low carbon technologies; lack of local public/private stakeholder involvement;
- **Institutional barriers:** Limited coordination and collaboration between relevant ministries; lack of local stakeholder engagement and participation
- **Policy barriers:** lack of transparent regulations; lack of viable and cost-effective incentives identified; fossil fuel subsidies; restriction on locations and construction; and land issues

Sri Lanka has already implemented several CPIs and other mechanisms, such as the SGF, FIT and SLCCS, that can potentially support the electricity sub-sector's market readiness and receptivity to CPIs. Furthermore, international collaborations, such as the World Bank's CPF and NAMA can build the subsectors capacity to develop core readiness components, such as MRV and registry systems, at the sector and program level. These will be further discussed in BB3. Nonetheless, there may be several barriers that could hinder the effectiveness of CPIs in the future. For example, conflicting policies, such as fossil fuel subsidies, could reduce the impact of a carbon price. High regulatory uncertainty and lack of awareness and capacity have also been key challenges faced by the domestic carbon offset scheme, SLCCCS. These challenges will be further discussed in BB4.

2.1.2 Transport sector

2.1.2.1 Composition of emissions and emission trends in the transport sector

According to Sri Lanka's SNC, emissions from the transport sub-sector represented 35% of Sri Lanka's net total CO₂ equivalent emissions, and almost half of emissions from the energy sector in the year 2000.

The total CO₂ equivalent emissions from this sub-sector is 5,084 GgCO₂eq, comprising 5,058 Gg of CO₂ emissions, 10 GgCO₂eq of CH₄ and 16 GgCO₂eq of N₂O. The majority of emissions come from road transport, representing 88% of total CO₂ emissions from the transport sector.

Table 8. Breakdown of emissions in the transport sector by emissions type and sub-sector in 2000

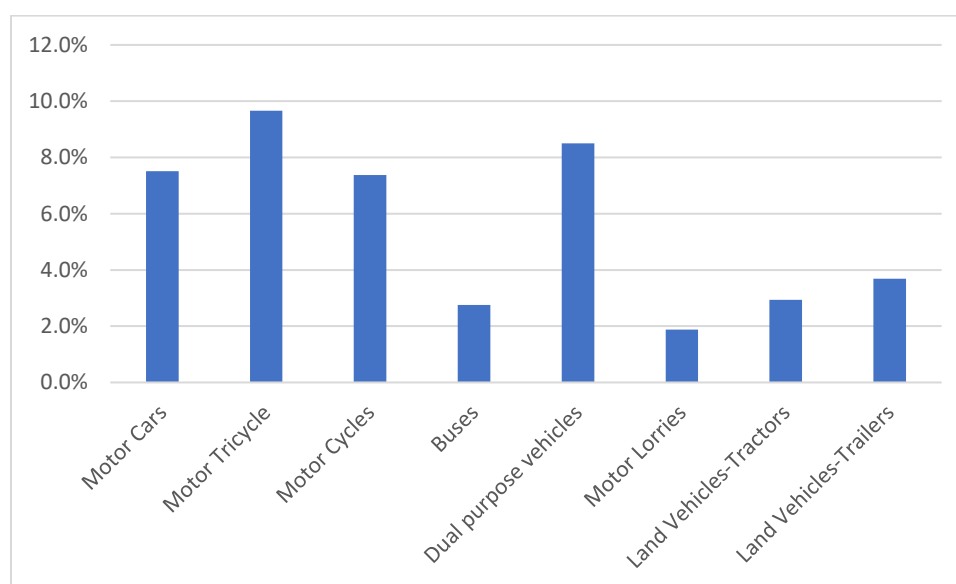
Sub-sector	Emissions (Gg) in the year 2000						
	CO ₂	CH ₄	N ₂ O	CO	NO _x	NMVOC	SO ₂
Road Transport	4444.03	0.47	0.04	131.47	46.96	25.26	7.5
Railway Transport	80.46	0.01	0	1.09	1.31	0.22	0.15
Air Transport	496.99	0	0.01	0.7	2.1	0.35	0.16
Sea Transport	36.7	0	0	0.5	0.75	0.1	0.17
Total	5058.18	0.48	0.05	133.76	51.12	25.93	7.98

(Source: Ministry of Environment and Renewable Energy, 2011)

Given road transport's significant contribution to GHG emissions in the transport sector, this section conducts a more in-depth assessment on past, current and future trends of road vehicle growth.

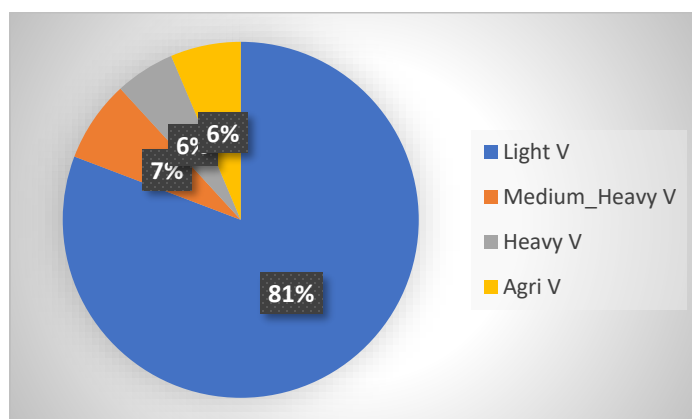
There are four primary categories of vehicles that are used on roads, namely *light vehicles* such as motor cars, tricycles and motorbikes; *medium heavy vehicles*, such as buses, dual purpose vehicles (e.g. vans), *heavy vehicles*, such as trucks and lorries, and *agricultural vehicles*, such as trailers and tractors. Country vehicle penetration rate of all four categories has shown a steady increase, primarily as a result of a relatively stable economic growth over the past decade. According to the Ministry of Transport (2017), the overall vehicle population growth rate has been around 7% per annum over the last five years. The following figure shows the Compound Average Growth Rate (CAGR) of all vehicle categories in the country from 2011 to 2015. Growth of motor tricycles is the highest in the country with a CAGR of 9.7%. This is followed by dual purpose vans, with a CAGR of 8.5% and motor cars, with a CAGR of 7.5%.

Figure 8. Growth rate comparison of different vehicle categories



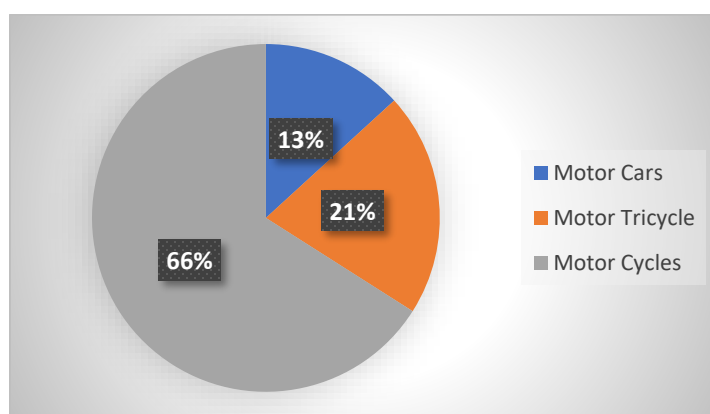
(Data source: Ministry of Transport (2017))

Figure 9. Modal share of key vehicle categories in Sri Lanka for the year 2015



Source: Preliminary estimation based on the Jayaweera (2008)

Figure 10. Modal share of light vehicles in 2015



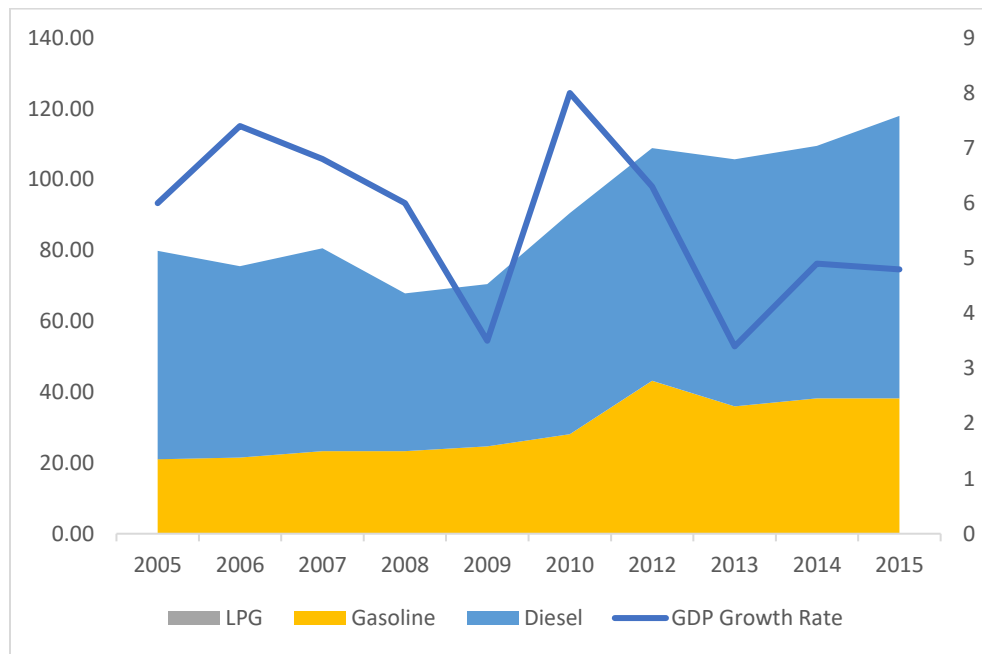
Source: Preliminary estimation based on the Jayaweera (2008)

The modal share of road vehicle fleets has not changed significantly over 2011 to 2015; and as shown in Figure 9, light vehicle is by far the largest component of road transport, with a modal share of 81% in 2015. Furthermore, Figure 10 suggests that motor cycle has a significantly higher modal share than other vehicle types.

In terms of energy use, the transport sector relies on three main fuel types: Liquefied petroleum gas (LPG), gasoline and diesel. It has been observed that diesel consumption is growing much faster than gasoline consumption. First, demand for gasoline may be more elastic to national GDP growth than diesel. During 2012-13, Sri Lankan GDP growth rate slowed down significantly to the level of 3.4% compared to 6.5% of the previous year. This has resulted in an estimated 17% decrease in gasoline consumption while diesel consumption more or less stayed the same. Further analysis will be required to better understand the elasticity of different fuels.

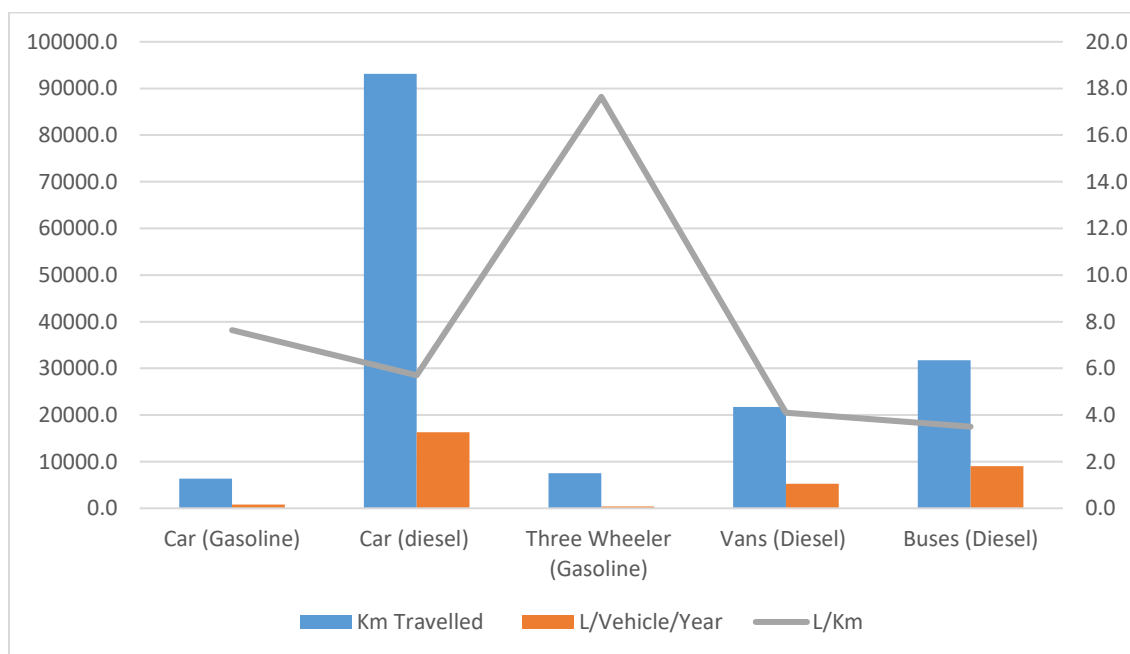
Second, diesel consumption may be growing faster than gasoline because diesel-run vehicles are less fuel efficient than gasoline-run vehicles, as shown in Figure 12 below. Gasoline-run vehicles travel on average 7.5 km per liter of gasoline, whereas diesel-run vehicles travel 6 km per liter of diesel. Overall, Sri Lanka's average fuel efficiency, which is around 13.15 L/100 km, is far lower than the global target to reach 4.2 L/100 km by 2030 under the Global Fuel Efficiency Initiative (GFEI) (GFEI, 2016). Climate mitigation efforts in the transport sector may therefore provide key sustainable development benefits by improving the overall fuel efficiency performance of vehicles.

Figure 11. Trend of transport fuel consumption and GDP growth rate



(Source: SLSEA, 2015)

Figure 12. Fuel efficiency performance of different categories of vehicles in Sri Lanka



Note: L/Vehicle/Year: Liter of fuel consumption per category of vehicle per year of running

The figure below shows preliminary projection of fuel demand in the country from 2011 to 2030 under the BAU scenario. Based on historic trends of vehicular population growth, light vehicles are expected to continue to grow and represent the largest share of the road vehicle population under the BAU scenario. It has been estimated that there would be around 9 million motor cycles by 2030, compared to 1.2 million of motor cars on the road. Demand for gasoline is growing double the rate of demand for diesel over the next few decades partly due to the fact that motor cycles are a major source of demand for gasoline. Specifically, it's been estimated that gasoline consumption would grow by 4.5% per annum rate compared to 2.6% for diesel. On the other hand, the number of buses is not expected to grow significantly under BAU. It is estimated that there would be around 150,000 buses in 2030, compared to 90,000 in 2011. Significant mitigation efforts would therefore be required to promote the use of public transport, and limit the growth of inefficient, emission intensive private vehicles.

Figure 13. Vehicle population forecast

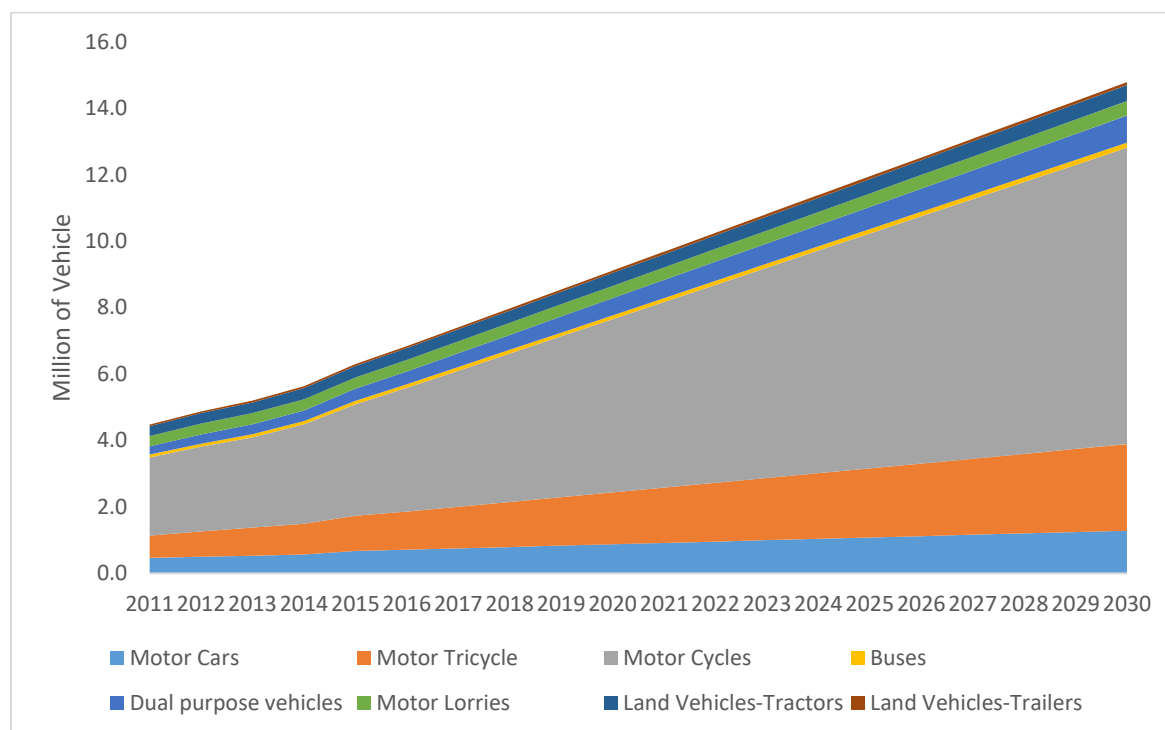
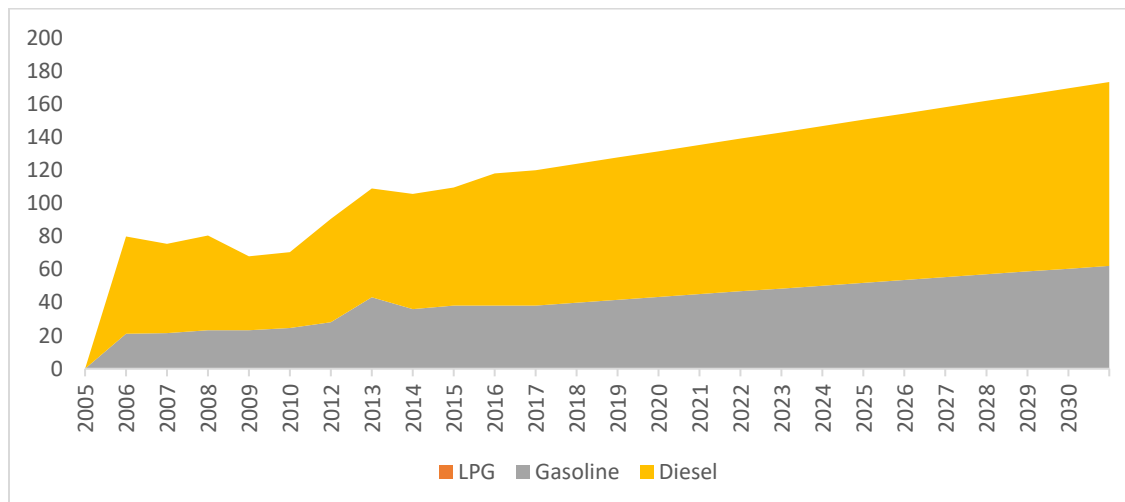


Figure 14. Transport fuel demand project (in PJ)



In conclusion, the transport sector is a major contributor to GHG emissions in Sri Lanka. As mentioned in section 2.1.1, the transport sector represents 44% of all emissions from the energy and energy end-use sectors (Table 6). Furthermore, GHG contribution from the transport sector, especially from road transportation, is expected to significantly increase as a result of economic growth. In particular, continued increase in private low occupancy vehicles due to poor public transportation network will increase the demand for imported fossil fuel (gasoline and diesel). This will in turn contribute to increased transport congestion and air pollution, higher reliance in fossil fuel imports, and higher emissions.

For these reasons, there is a strong economic and environmental rationale to support mitigation efforts in the transport sector. For example, reducing carbon intensity of fuels by substituting petroleum-based products, which would in turn reduce GHG emissions, could also reduce demand for and reliance on fossil fuel imports, which is already costing Sri Lanka about 6% of its GDP (MMDE, 2016 a). Other mitigation strategies include encouraging a change in modal shift towards public transportation, and improving the fuel efficiency across vehicle categories. Furthermore, it is important to take into account the expected sustainable development outcomes of mitigation measures in the transport sector. For example, investing in highways or improving existing roads can also support economic growth by increasing labor mobility and accessibility to poor rural regions (Asian Development Bank, 2012).

2.1.2.2 Existing mitigation strategies and policy instruments

The main objectives of Sri Lanka's urban transport system development are to (a) promote equity in transport to all members in society and affordability (b) enhance the efficiency in transport systems; (c) reduce the adverse environmental and health impacts resulting from the transport sector; and (d) ensure safety and security. There are a number of mitigation strategies and policies already in place to address these goals and support mitigation efforts in the transport sector.

For example, the draft **National Transport Policy**, which was prepared by the National Transport Commission in the Ministry of Transport, is the key document addressing the national objectives and strategies for Sri Lanka's transport sector (MMDE and UNDP, 2016). The National Policy proposes specific steps to reduce dependency on petroleum fuels for its mobility requirements. This would be achieved by actively promoting the use of less energy consuming modes of transport, with an emphasis on increasing the share of users on public transport, reduction of unnecessary travel, improved vehicle technology and better management of transport systems including the road and public transport network. These proposed strategic areas would be implemented through fiscal and non-fiscal measures. For example, the government intends to re-structure the present tariffs regime to discourage the importation and use of energy inefficient vehicles. In addition, the government also plans to provide support to RD&D to modernize the transport sector to ensure greater passenger convenience, as well as improved reliability and efficiency in the transport sector (Kumarage, 2011).

Furthermore, the **Urban Transport Master Plan** was also established under the Ministry of Transport in 2014 to promote public transport in Colombo Metropolitan Area (MMDE and UNDP, 2016). The plan is a comprehensive document which proposes various strategies for public transport and road networks, while taking into consideration the institutional set-up and financial arrangements for the proposed activities.

A number of broader, cross-cutting strategies and plans also propose relevant mitigation interventions for the transport sector. For example, the **National Climate Change Policy and Sri Lanka Strategy for SD**, as mentioned in BB1, highlights the need to take action to promote integrated transportation systems, low emission fuels and improved fuel efficiency. The **Western Region Megapolis Master Plan** also identifies areas to lower emissions in the road transport. On the other hand, the **Energy Sector Development Plan for a Knowledge-Based Economy**, which also includes broader mitigation efforts for the energy sector as mentioned above, has set a target to reduce petroleum fuel use in the transport sub-sector by 5% by 2020 through the introduction of alternative strategies such as efficient modes of transport and electrification of transport.

The table below summarizes Sri Lanka's sustainable priorities for the transport sector (MMDE and UNDP, 2016).

Table 9. Summary of Sri Lanka's transport sector's sustainable priorities

Priority	Description
Public Modes for Transport	Large scale development and introduction of efficient public transport system leading to a modal shift from private to public modes of transportation.
Alternative vehicles	Increased adoption of electric and hybrid vehicles running on alternative fuels such as electricity and biofuels.
Urban congestion and pollution	Reduced traffic congestion and air, noise pollution in urban areas, especially the CMA through increased adoption of public and alternative modes of transportation.
Energy security	Achieving greater diversity of fuel sources and reduced dependence on imported sources of fuel especially petroleum.
GHG emissions	Reduced GHG emissions from the transport sector through the adoption of alternative clean fuel vehicles and public modes of transport, thereby decreasing the sector's reliance on fossil fuel.

Source: MMDE and UNDP (2016)

Sri Lanka has introduced a number of policy instruments and measures to support emission reduction in the transport sector:

- **Air Emission Standards, Fuel Standards and Vehicle Importation Standards** were introduced in 2003 (amended in 2008) by the MMDE (then Ministry of Environment and Natural Resources) as part of the National Environmental Act (MMDE, 2003).
 - **Air Emissions Standards:** No owner or user of a motor vehicle is permitted to operate a motor vehicle that discharges exhaust emissions into the atmosphere that exceed the Vehicular Emission Standards. Every owner or user is required to produce an annual compliance certificate of Vehicular Exhaust Emissions, issued by an accredited vehicle emission testing center.
 - **Fuel Standards:** No person shall supply, sell or distribute fuel for the use of any motor vehicle that is not in compliance with the permissible fuel standards.
 - **Vehicle Importation Standards:** Every person who imports a motor vehicle shall produce a compliance certificate of Vehicle Exhaust Emission Standards.
- **Importation of three wheelers (or tuk tuks) with two-stroke engines was banned** in 2008 since two stroke engines are considered to be a key source of air pollution as well as heart and respiratory diseases.
- **Vehicle tax reforms** were introduced in 2016 based on the engine capacity of individual vehicles in order to promote certain types of electric and hybrid vehicles. In particular, lower grade electric vehicles such as Nissan Leaf, will see a share drop in taxation rate, while luxury electric vehicles such as Tesla Model S are expected to see a significant increase in overall price. The tax reforms only impact family grade vehicles, and do not affect commercial grade vehicles such as vans, trucks. (Carmudi, 2016) (Economy Next, 2016).

- **NAMA in the transport sector (“Transport NAMA”):** This NAMA aims to adopt electric buses in the planned Bus Rapid Transit (BRT) system in the Colombo Metropolitan Area. Please see section 2.2.3 for further information.

The Ministry of Local Government and Provincial Councils supports several mitigation actions in the transport sector at the project level. For example, from 2009 to 2014, the Asian Development Bank (ADB) provided a loan to improve the connectivity in the transport networks of two relative poor and conflict-affected provinces, Eastern and North Central Provincial Road, and improve institutional capacity of the Eastern Provincial Road Development Department and North Central Provincial Road Development Authority. From 2009 to 2015, the World Bank also provided funding to the Government to improve the access to socio-economic centers in the Uva, Eastern and Northern Provinces in Sri Lanka through sustainable management of improved road infrastructure (World Bank, 2016 b). The Ministry of Local Government and Provincial Councils was in charge of overseeing and coordinating the work of the Province, while the Provincial Road Development Departments were responsible for implementing the project activities at the provincial level.

2.1.2.3 Barriers for implementation of mitigation measures, including CPIs

General challenges to mitigation measures in the transport sector, particular in the context of road transport are:

- **Technical and structural barriers:** Uncontrolled roadside development has reduced the capacity of the road network
- **Financial barriers:** High financial cost of infrastructure investments hinder the successful implementation of proposed transport policies; lack of innovative financing schemes to afford the construction of intercity expressways in strategic transport corridors
- **Institutional barriers:** Scope of widening roads on existing alignments is limited as a result of land acquisition issues; fragmented policy formulation responsibilities with multiple ministries and agencies

Until recently, Sri Lanka has mainly used command-and-control regulations, such as emissions/fuel standards and import bans, to improve fuel quality and efficiency of transport modes and vehicle technologies. Nonetheless, the recent tax reforms and transport NAMA suggest a potential move towards mechanisms that could build readiness for CPIs. While data analysis on the status and challenges of these policy instruments are limited, there may be a number of potential barriers to introducing CPIs in the transport sector. For example, methodologies and MRV framework that form the foundation of CPIs may be less developed, compared to electricity generation. The impact of a carbon price (depending on the market rate) may only represent a small portion of the total cost of the vehicle, and may therefore not be appropriately factored into consumer and/or manufacture decisions. A more detailed analysis on owners/users’ economic profile and willingness to pay could be helpful to understand what the level of effective carbon price is for the transport sector. Furthermore, CPIs or other market based incentives, a “demand-pull” approach, need to be introduced with a wider set of complementary, “technological-push” policies and actions. For example, R&D activities as well as investment in charging stations and other infrastructures are needed to support adoption of electric vehicles at scale. Regulations and standards may also be required to improve the quality, efficiency and safety of public transportation (World Bank, 2001).

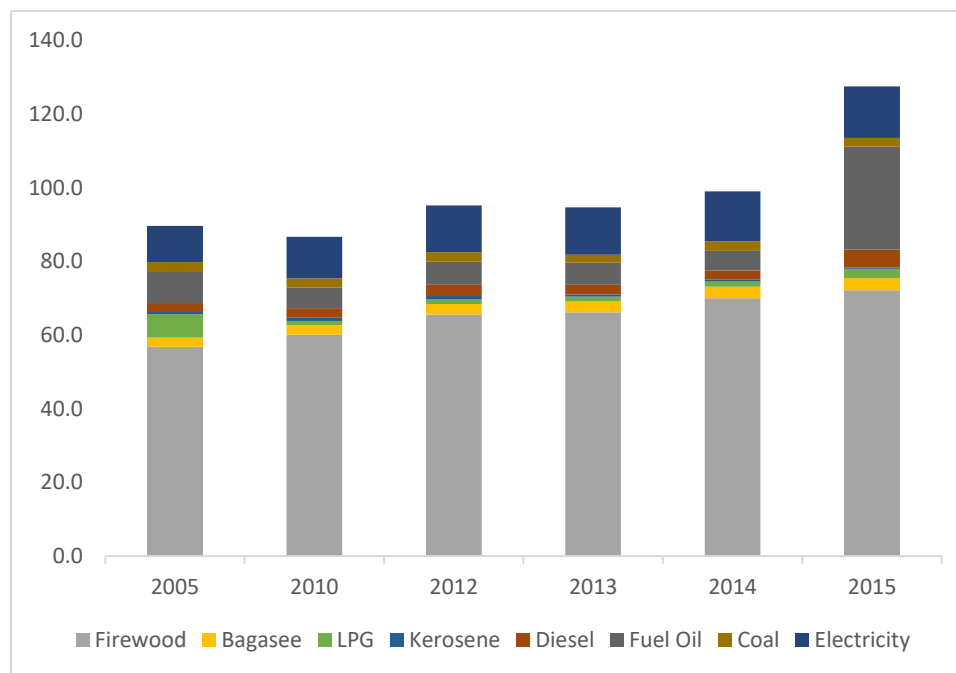
2.1.3 Industry

2.1.3.1 Composition of emissions and emission trends in the industry sector

The industry sector covers the second largest share of energy consumption in Sri Lanka. Apart from emissions generated from energy consumption, the key industries contributing to GHG emissions are Cement, Manufacture and Lime production. However, this section focuses on analyzing the emissions trends from industry energy use, since this is a priority area in Sri Lanka's NDC for the industry sector.

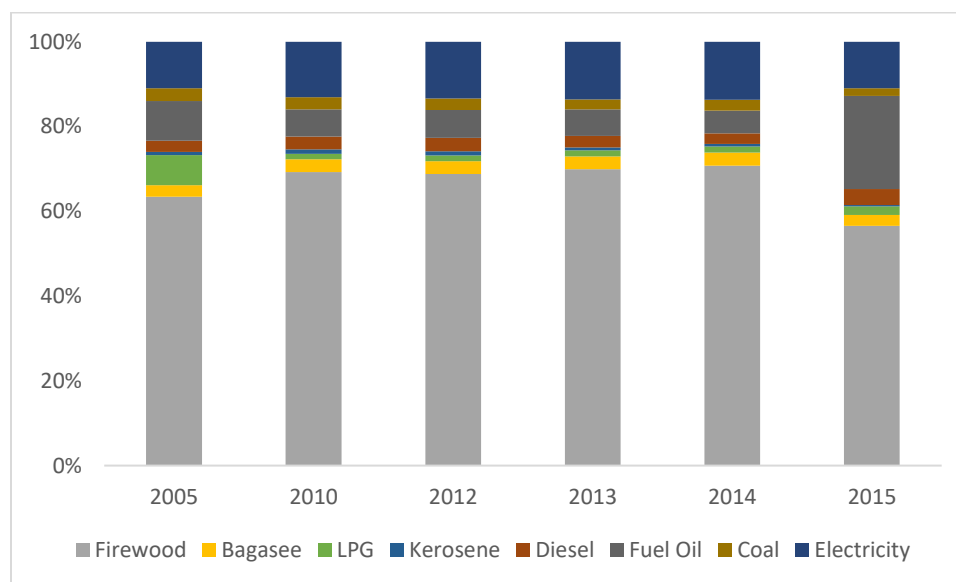
The estimated industrial energy consumption growth rate is relatively low at around 4% per annum since 2005. Biomass is the main source of energy from the industry sector with firewood being the most commonly used biomass type. The reliance on biomass for energy is primarily due to rising global fossil fuel prices and removal of fossil fuel subsidies. In 2015, biomass represented around 76% of total industrial energy consumption, whereas cleaner fuels such as electricity only represented around 14% of the total. The share of biomass consumption has fallen in recent years but, as shown in Figure 16, this is primarily replaced by a dirtier fuel, fuel oil. As shown in Figure 17, fuel oil consumption in the industry sector has increased the most rapidly among all fuel sources from 2005 to 2015, at around 12.8% per annum.

Figure 15. Fuel consumption pattern of industry sector in Sri Lanka (in PJ)



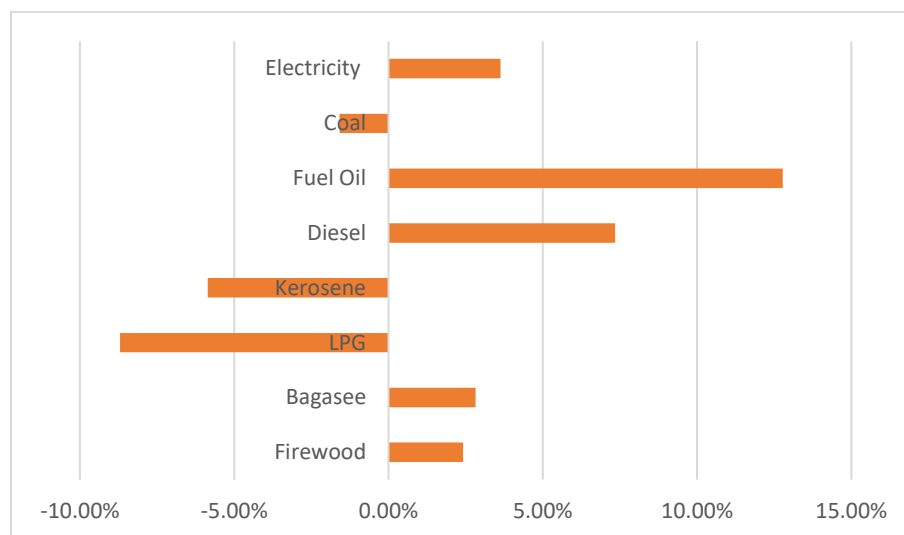
Source: SLSEA, 2015

Figure 16. Percentage contribution of different fuels in total industrial energy supply



Source: SLSEA, 2015

Figure 17. Percentage change per annum in fuel consumption in the industry sector in Sri Lanka (from 2005 to 2015)



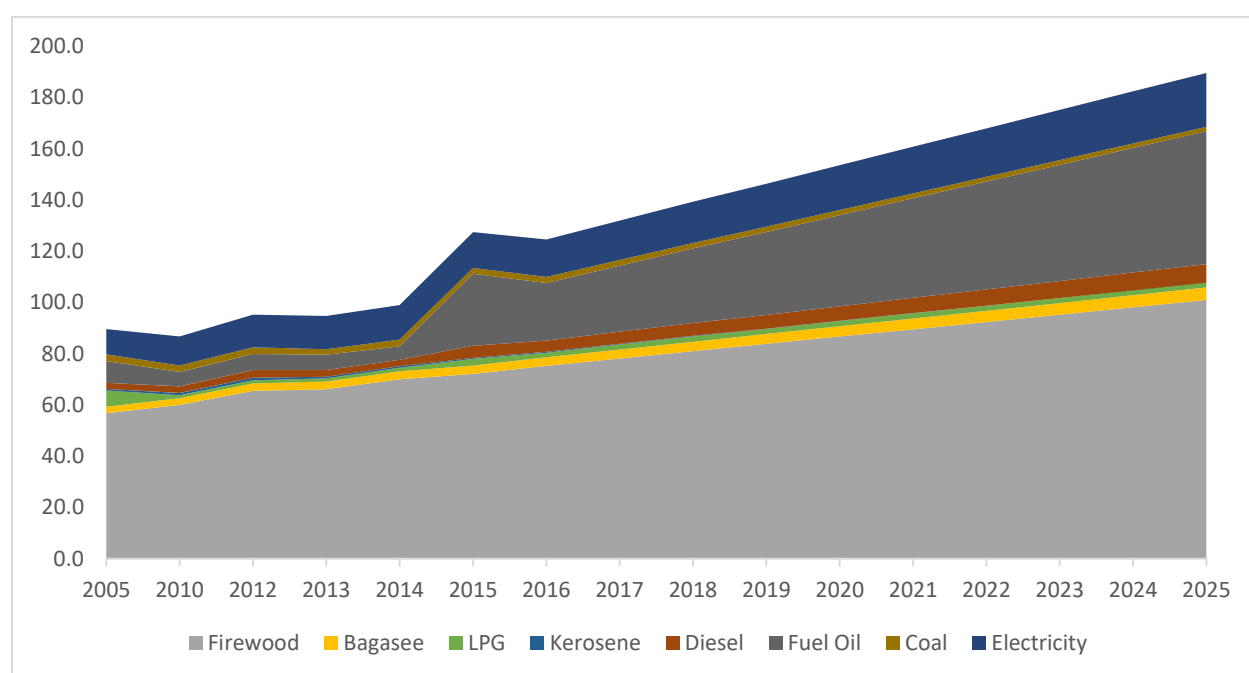
Data source: SLSEA, 2015

Although the consumption of petroleum commodities like kerosene and LPG have reduced from 2005 to 2015, the consumption of other emission-intensive fuels such as diesel and light fuel oil have increased significantly. On the other hand, while the consumption of solid hydrocarbon such as coal has decreased, the use of biomass fuels (primarily firewood) has increased. Burning biomass is, in principle, carbon neutral if the biomass resources are replaced as fast as they are used, and there are some examples of sustainable biomass fuel use in certain industries (e.g. coconut production and tea). However, since there

are no national or industry requirements to source renewable biomass, it is not clear whether the industry sector is implementing afforestation and reforestation activities to replace the firewood used.

Based on historic trend of energy consumption in the industry sector, consumption of various fuels by the sector has been forecasted using best fit time series forecasting techniques. BAU level forecasting shows some alarming signs for the sector in terms of GHG emissions and air pollution. As shown in Figure 18 below, preliminary analysis suggests that firewood is still expected to be the main source of energy for the industry sector in the country followed by the fuel oil under the BAU scenario case. These fuels could have negative sustainable development and climate impacts. For example, as mentioned above, biomass could have a negative impact on the country's carbon sink. At the same time, fuel oil is emissions-intensive and would further contribute to the country's GHG emissions. The high demand for biomass could have other negative impacts on sustainable development. For example, the increase in demand for biomass could result in an increase in illegal logging since the biomass supply chain is highly informal (SLSEA, 2015 a).

Figure 18. Preliminary projection of industrial energy consumption in Sri Lanka (2005 – 2025)



The key motivation behind prioritizing mitigation efforts in the industry sector is to help modernize technologies and improve efficiency of production. By doing so, it is envisioned that mitigation efforts in the industry sector can also support sustainable development goals, for example, by improving the performance and competitiveness of export-orientated industries such as the apparel and textile industry, and reducing air pollution.

2.1.3.2 Existing mitigation strategies and policy instruments

The main strategies for achieving emission reduction in the industry, as indicated in the NDC, are, among others: modernizing and improving the efficiency of industries; encouraging fuel switching to biomass; and promoting tax structures to promote sustainable technologies.

Compared to the energy and transport sectors, there are less sector-specific climate policies in the industry sector. The main sub-sector policy is the **Cleaner Production Policy** which was introduced in 2004 by MMDE in collaboration with the Ministry of Health and Ministry of Tourism to incorporate clean production practices in the health and tourism sector. There are also relevant cross-cutting plans, which highlight the importance of improving the efficiency of energy consumption in the industry sector, such as the **National Climate Change Policy** and the **Energy Sector Development Plan for a Knowledge-based Economy** mentioned above.

Main existing policy instruments and measures that have been implemented to achieve emission reductions in the industrial sector include:

- **NGRS:** The MMDE established the NGRS in 2011 to promote reporting of sustainability performance in the manufacturing and service sectors (MMDE, 2011). The overall objective is to recognize and reward industries based on their reported sustainability performance. Over 120 manufacturing and service sector organizations have shown interest in participating in the program. Training and awareness sessions for interested industry professionals are conducted regularly. Please refer to section 3.3.1 for further information on the NGRS.

Projects have also been introduced to promote mitigation efforts for specific industries. For example, the **Switch Asia Greening Sri Lanka Hotel Project** was managed by the Ceylon Chamber of Commerce to address the issue of high energy, water and resource consumption in the small and medium sized hotel and hospitality sector in Sri Lanka. Activities included workshops, awareness raising, onsite walk through audits and outline options for efficiency improvements. 261 workshops were conducted and 179 audits were completed before further funds to expand the program were halted in 2013.

2.1.3.3 Barriers for implementation of mitigation measures, including CPIs

Barriers for implementing mitigation measures in the industry sector would likely depend on the nature of the specific industry (e.g., whether the industry is export orientated, energy intensive, service or manufacture-based). However, in general, barriers may include:

- **Policy instruments:** lack of enforcement standards or monitoring procedures, and limited transparency on requirements and achievements of existing mitigation measures
- **Information barriers:** The sector has limited experience in participating in climate policies to date; there is also limited understanding on the mitigation options available
- **Institutional barriers:** Mitigation measures tend to be introduced at the sub-sector level (e.g. manufacturing or service sectors) or relate to the energy sector; and there is currently limited institutional capacity to coordinate these measures effectively.

The Energy Sector Development Plan for a Knowledge-based Economy identifies energy conservation in industrial sector as one of the strategic priorities. However, there is currently limited policy instruments or measures in place that specifically target NDCs in the industry sector, such as improving the “efficiency of industrial energy/water/raw materials”, “greening the supply chain through introducing the life cycle management and industrial symbiosis to maintain zero waste” and “introduce high efficient motors for the entire industrial sector”. While the NGRS mentioned above could provide relevant requirements for monitoring GHG emissions that could inform the national MRV framework under BB3 (to be further discussed in section 3.3.1), NGRS reporting requirements have only been undertaken by less than 30 companies. Furthermore, readiness and receptivity to participate in CPIs may

also differ depending on the nature of the industry. For example, industries with CSR may already be collecting relevant data for CPIs, or have compliance targets that would incentivize their participation in carbon markets.

2.1.4 Waste sector

2.1.4.1 Composition of emissions and emission trends in the waste sector

The primary type of GHG emissions in the waste sector is methane. The main source of emissions is MSW, which represents 87% of total waste generated in Sri Lanka. This is followed by wastewater which represents 8% of total waste and industrial waste which represents 5%.

Table 10. Breakdown of emissions in the waste sector by source

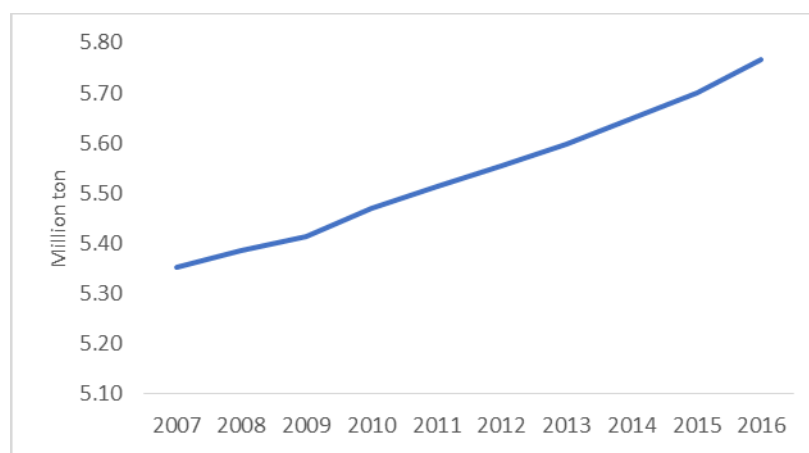
Source	Emission	
	GgCH ₄	GgCO ₂ eq
MSW	84.06	1,765.2
Domestic and Commercial Wastewater	7.91	166.1
Industry	4.85	101.8
Total	96.82	2,033.1

Source: Ministry of Environment and Renewable Energy, 2011

Waste disposal, especially in relation to MSW management, is one of the major civic challenges in Sri Lanka. Local Authorities are responsible for MSW management, though capacity of Local Authorities is usually not sufficient to manage all the waste generated in their region.

It has been estimated that the rate of MSW generation in the country is around 0.8 kg per capita per day. Furthermore, out of the 7 million ton of total solid waste generated in the country per day, only 3.5 million ton is collected and processed. The rest of the waste are either left lying at the source or dumped illegally in low lying open areas. As shown in Figure 19 below, solid waste generation has increased significantly from 5.35 million ton in 2007 to 6.54 million ton in 2016. Mitigation efforts (such as the investment in waste-to-energy projects) would therefore be important in addressing Sri Lanka's serious solid waste management crisis.

Figure 19. Solid Waste Generation from 2007 to 2016



Out of the total solid waste generated in the country, it has been estimated that around 65% of the waste is bio-degradable. The biodegradable portion of MSW, which generates a significant amount of methane, would be one of the most important factors to support GHG emission reduction in the sector. Figure 21 shows the estimated methane emissions between 2007 and 2016 from the biodegradable solid waste.

Figure 20. Composition of waste generated in Sri Lanka

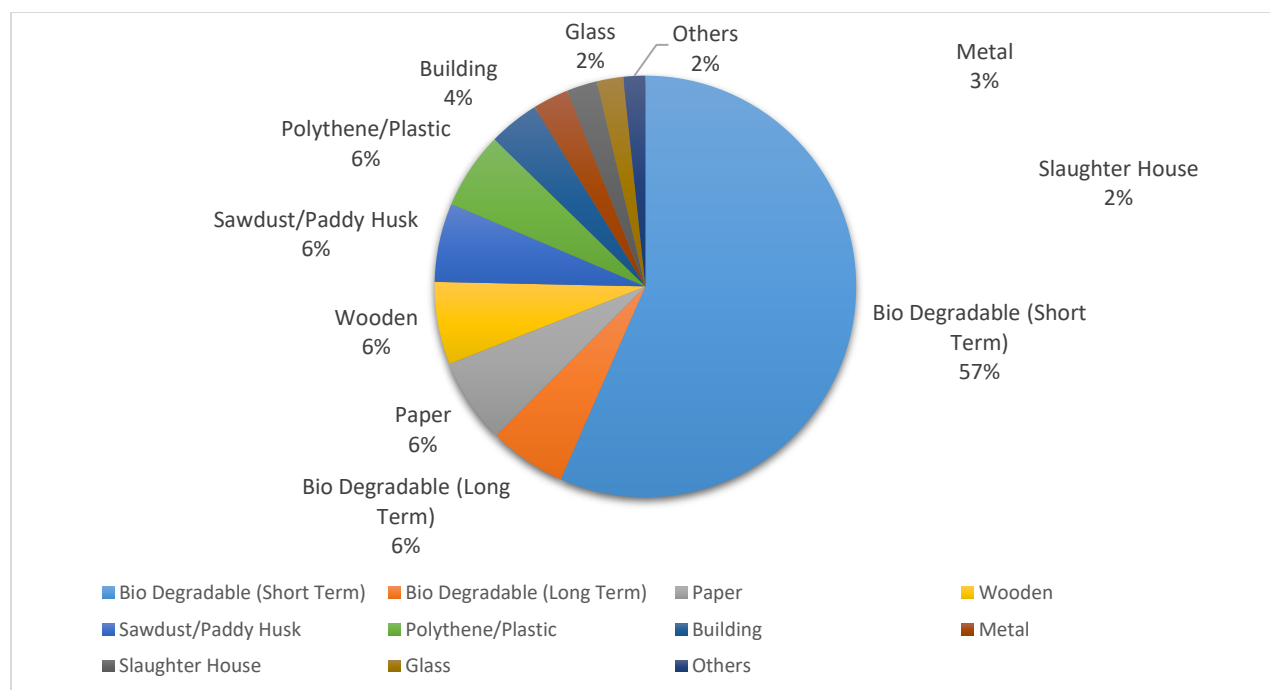
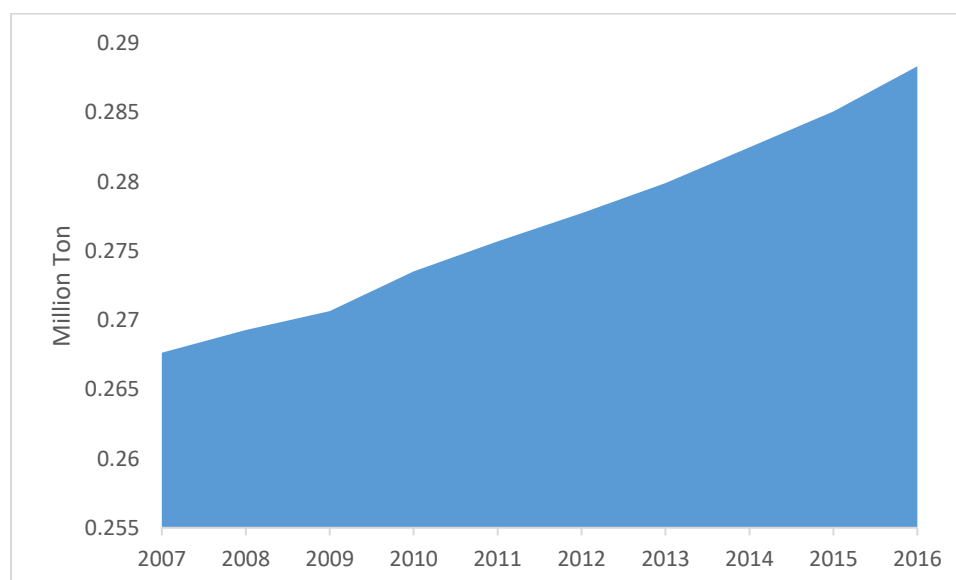


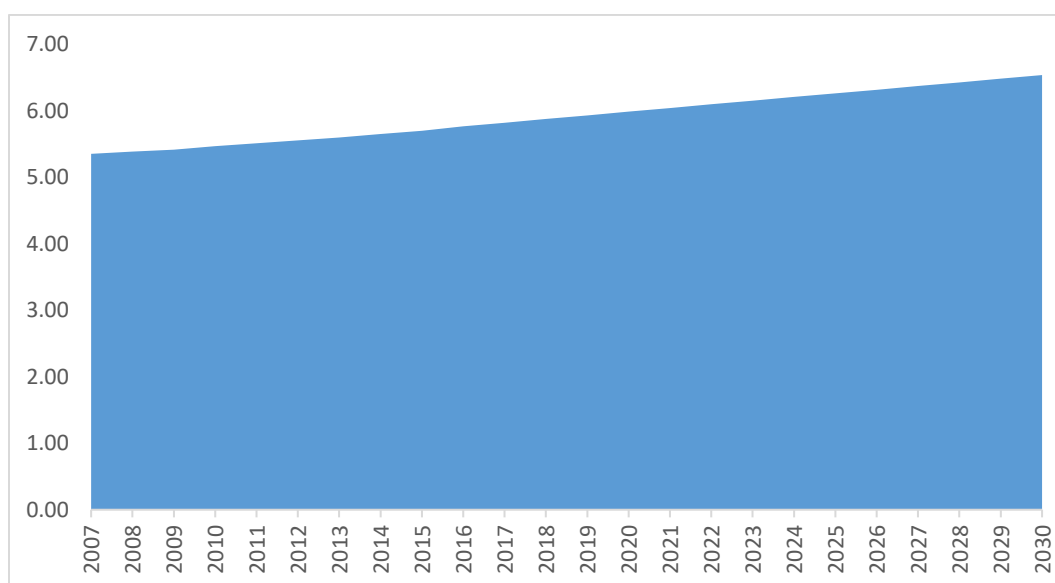
Figure 21. Methane emissions from solid waste in Sri Lanka



Based on historic trends, MSW generation is expected to increase by around 1% per annum from 2007 to 2030, compared to a population growth of 0.9% per annum. By 2030 the national aggregated solid

waste generation per annum would be around 6.5 Million ton with a population of around 24 million (see Figure 22). Furthermore, it has been projected that by 2030, the aggregated methane emissions generated from MSW from the country would be around 0.34 Million ton compared to 0.27 Million ton in 2007. Not only is methane a significant contributor to climate change (1 KG of methane is equivalent to around 25 KG of CO₂), it also causes serious health hazards, especially since many landfill sites are in highly populated residential areas. Improving MSW management therefore offers a wide range of development benefits such as reducing health hazards, environmental pollution, in addition to contributing to emission reduction.

Figure 22. Projected solid waste generation in Sri Lanka (Million ton)



2.1.4.2 Existing mitigation strategies and policy instruments in the waste sector

Sri Lanka's NDC identifies a range of actions for emission reduction in the waste sector, for example, introducing waste-to-energy programs; designing and implementing comprehensive MSW strategies for 40 to 60% of Local authorities by 2030; and introducing a source separation system at the household level.

The **National Policy on Solid Waste Management**, which was established in 2007 by the MMDE, is the main domestic mitigation strategy for the waste sector. The main objective of the policy are to (a) ensure the environmental accountability and social responsibility of all waste generators, managers and service providers; (b) to actively involve individuals and institutions in integrated and environmentally sound solid waste management practices; (c) to maximize resource recovery with a view to minimize the amount of waste for disposal and (d) to minimize adverse environmental impacts due to waste disposal to ensure health and wellbeing of the people and ecosystems (MMDE, 2012 a). The policy identifies 10 management strategies, including providing institutional strengthening and capacity building for Local Authorities; minimizing landfill; and implementing annual performance reporting and effective monitoring mechanisms at the Local Authority level (Centre for Poverty Analysis , 2007).

To help implement Sri Lanka's NDC in the waste sector, the **Waste Management Action Plan** is also being developed for every province (MMDE, 2016 b). The Action Plan identifies the following priority areas:

1. Monitor the amount of waste collection by each Local Authority to guide management priorities
2. Explore the possibility of compositing and clustering among Local Authorities
3. Introduce a collection calendar for each Local Authority
4. Improve the facilities for waste collection and treatment
5. Introduce a public awareness program

The following instruments have been introduced to support mitigation efforts in the waste sector:

- **Ban of polythene products:** Sri Lanka has banned the use of polythene lunch sheets, rigifoam boxes and shopping bags, with effect from 1st of September 2017. In a bid to make Sri Lanka polythene-free and find a sustainable solution to solid waste management, President Maithripala Sirisena has announced a number of measures including the ban on the import, manufacture and sale of lunch sheets and a ban on the use of polythene for decorations. Central Environmental Authority will be responsible for the implementation. In the past, as part of the National Environment Act, the MMDE introduced a ban in 2007 to prohibit the manufacture, sale of use of polythene or any polythene product of 20 microns or below in thickness for in country use. Polythene are typically used in shopping bags, wrapping or packaging materials (MENR, 2006).
- **National "Pilisar" Waste Management Program** was introduced in 2008 for a three-year period to translate the targets set under the National Policy on Solid Waste Management. Activities covered by the Program include, among others: collecting information on disposal of solid waste by local authorities; establishing waste collecting centers; technical support, institutional strengthening and capacity building; establishing recycling collection networks for metal, plastic, glass and paper wastes; carrying out legal action against local authorities that do not carry out adequate solid waste management practices. An Apex Body co-chaired by the Secretaries of the MMDE and Ministry of Local Government and Provincial Councils was established to provide overall guidance on the program. Technical Experts Committees on thematic areas such as Composting and Biogas, landfilling and recycling, have also been appointed to provide necessary technical inputs to the Pilisar Projects.
- **The National E-Waste Management Policy** was launched by the CEA in 2010 to collect and dispose electronic waste. In Sri Lanka, demand for electronic items is relatively high. According to a study conducted by MMDE (formerly known as Ministry of Environment and Natural Resources) and CEA titled "Development of a National Implementation Plan for Electrical and Electronic Waste Management in Sri Lanka" in 2008, annual growth rates estimated for major electronic items such as personal computers, televisions, printers and batteries was around 10%. The National Implementation Plan is a pilot project which includes regulations on the use and disposal of mobile phones, computers and accessories, as well as guidelines to manage used lead acid batteries. The program also includes other approaches, such as electronic waste awareness programs/workshops, and introducing recycling system (Mallawarachchi & Karunasena, 2012).

- **Greater Colombo Wastewater Management Project:** The project aims to upgrade the sewerage infrastructure, as well as strengthen institutional and operational capacity and improve institutional capacity through community participation/public education program. The Executing Agency is the Ministry of Provincial Councils and Local Government, and the project is expected to be completed in 2019 (Asian Development Bank, 2017).

2.1.4.3 Barriers for implementation for mitigation measures, including CPIs

The following technical, financial, policy, information and institutional barriers need to be addressed for effective emission reductions in the waste sector:

- **Technical and structural barriers:** lack of technical capacity by the Local Authorities to formulate, establish and run proper waste management plans; lack of infrastructure facilities such as machineries and equipment
- **Financial barriers:** Insufficient public funds for operations relating to separation, compositing, recycling and disposal. Lack of financial support for the establishment of large-scale recycling and disposal facilities
- **Policy instruments:** Poor enforcement standards causing illegal dumping and unmanaged dumpsites without minimal requirement (Centre for Poverty Analysis , 2007)
- **Information barriers:** Lack of community participation in the reuse and reduction of waste (Karunaratne, 2015). In the case of e-waste management, lack of monitoring and evaluation procedures on electric waste management at the national or organization level (Mallawarachchi & Karunasena, 2012)
- **Institutional barriers:** National and provincial level policies and strategies are not adequately harmonized with local needs and capacity, that is, waste policy is determined at the national level, but waste collection and management is undertaken at the provincial level. In the case of e-waste management, lack of compliance in waste collection, storage, treatment and disposal, mainly due to lack of awareness (Mallawarachchi & Karunasena, 2012)

A major challenge to implement CPIs is the lack of data and methodologies for measuring, reporting and verifying emissions and mitigation actions in the waste sector. Furthermore, further analytical work will be required to better understand perception and receptivity to CPIs in the waste sector. Lack of technical/institutional capacity and financial resources, which is already an issue for Local Authorities, may further hinder the sector's ability to participate in potential CPIs.

2.1.5 Concluding remarks

The purpose of section 1 of BB2 is to preliminarily map out the current policy landscape, objectives and needs in Sri Lanka's four priority sectors for climate change mitigation, namely energy (electricity generation), transport, industry and waste.

It is clear from this preliminary analysis that the rationale for focusing on these four sectors are based on a range of environmental, social and economic factors, in addition to climate change mitigation. To support these goals, Sri Lanka has already introduced a number of sector-specific and cross-cutting targets and policies to support emission reduction in these key sectors. For example, in addition to the sector policies and plans summarized below (Figure 14), there are also cross-cutting policies such as

National Climate Change Policy and the Sri Lanka Strategy for Sustainable Development, and regional plans such as the Western Region Megapolis Master Plan. The number of policies and programs in each sector show Sri Lanka's strong commitment to climate action and sustainable development that builds on solid political and institutional support.

This preliminary assessment suggests that the energy sector may have more market experience than the industry, waste and transport sectors. At the domestic level, the electricity subsector has already participated in mitigation mechanisms, such as SLCCS, the FIT and SGF. PMR can also leverage ongoing support to enhance MRV frameworks in the energy sector through CPF and NAMA.

Table 11. Preliminary policy mapping in the energy, transport, industry and waste sectors

Sector	Sector policy and plans	Key stakeholders	Policy instruments
Energy	Energy Development Plan for a Knowledge-based Economy (2015)	Ministry of Power & Renewable Energy	<ul style="list-style-type: none"> • FIT • NAMA • CDM • SLCCS • SGF
	National Energy Policy & Strategies (2017)	Ministry of Power & Renewable Energy, Sustainable Energy Authority, Ceylon Electricity Board, Lanka Electricity Board	
Transport	National Transport Policy (2008)	Ministry of Transport & Civil Aviation, Ministry of Megalopolis & Western Development	<ul style="list-style-type: none"> • NAMA • Emission, Fuel and Vehicle Importation Standards • Ban on import of three wheelers with two-stroke engines • Road projects
	Urban Transport Master Plan (2014)	Ministry of Transport	
Industry	Cleaner Production Policy (2004)	MMDE, Ministry of Health and Ministry of Tourism, National Cleaner Production Centre	<ul style="list-style-type: none"> • NGRS
Waste	Solid Waste Management Policy (2006, 2008, 2009)	MMDE, Central Environment Agency	<ul style="list-style-type: none"> • E-waste program • Ban of polythene products • Pilisar • Greater Colombo Wastewater Management Project

While Sri Lanka's NDC has already laid out a number of policies and actions in these key sectors, it also recognizes that further data collection and analysis is required to better understand the mitigation potential, objectives and policy landscape of key sectors. Key research gaps and priorities identified in section 2.1 include:

- (a) Projected sectoral contribution to emission reduction targets under Sri Lanka's NDC

- (b) Status of existing mitigation measures, including achievements and challenges to date
- (c) Gap between emission reduction levels required to achieve sectoral NDC goals and the mitigation potential of existing mitigation measures
- (d) Potential role of CPIs in addressing policy gap in key sectors, and potential barriers for implementation (e.g., availability of core readiness component, such as MRV and registry; political receptivity to carbon pricing)
- (e) The complementarity between CPIs and other policies and actions in the sector

2.2 Overview of Sri Lanka's experience with market-based instruments and other related instruments

The second part of BB2 provides a high-level analysis of Sri Lanka's experience with market based mechanisms, such as project-based crediting and RBCF, which could potentially be leveraged to support activities under PMR. In particular, it aims to understand: whether and how capacities, methodologies and infrastructures used for these schemes can be integrated/leveraged to support the development of core readiness components under BB3; and how the country's market experience to date can inform the type and scope of CPIs supported under BB4.

2.2.1 SLCCS

2.2.1.1 Objectives

The SLCCS is a nascent national voluntary carbon offset scheme launched in 2016 that has been initially executed by the SLCF. The scheme was launched to achieve the following objectives:

- To introduce a more effective and user-friendly program that brings quality assurance to authentic GHG reduction and removal project activities.
- To provide transparent service to its clients in the process of project validation, verification, certification and registration.
- To facilitate responsible GHG emitters to access voluntary, compliance credits/offsets of quality-assured emission reductions generated by approved projects
- To encourage projects with benefits other than GHG reduction and/or removal, such as projects that help communities to improve their livelihood, or enhance ecological services
- To provide innovative carbon crediting approaches to businesses, non-profits and government entities that engage in on-the-ground climate action

2.2.1.2 Governance structure and key design features

To implement the scheme, the SLCCS has set up the Executive Board (EB) that includes three independent experts and two representatives of key government bodies⁷. The envisaged role of SLCCS EB is providing strategic governance and guidance, as well as approving new methodologies where relevant. The SLCCS's rules and procedures have been developed in consultation with stakeholders and peer reviewers. SLCF aims to provide a range of carbon certification services in line with internationally recognized standards such as the GHG Protocol, ISO 14064-1 & 2 and PAS 2050 Carbon Foot printing

⁷ Prof. R. Attalage, Professor, University of Moratuwa; Mr. C. Maliyadda, Director General, Office for National Unity and Reconciliation; Dr. L. Senaweera, Former Director General, Sri Lanka Standard Institute; Prof. W. L. Sumathipala, Senior Technical Advisor, Ministry of Mahaweli Development and Environment; Mr. K. Wikramaratne, Chairman, Sustainable Energy Authority

Standards. Under the scheme, interested entities may also submit new methodologies to the SLCCS for approval via the public stakeholder consultation and scientific peer review. However, given the capacity constraints and existence of international methodologies for quantification of emission reductions, SLCF uses mostly CDM methodologies. Table 12 below provides an overview of the current governance structure of SLCCS.

Table 12. Current institutions for key bodies that support SLCCS

Role	SLCCS institution	Specific responsibilities
Executive Body (EB)	SLCCS EB	<ul style="list-style-type: none"> • Strategic governance and guidance • Approving new methodologies and significant revisions • Approves project registrations • Approve credit issuance • Accrediting additional auditors (i.e. other than SLCF) although there is not a specific process in place for this.
Administrator	SLCF	<ul style="list-style-type: none"> • Updating program rules and procedures • Reviewing project submissions and verification reports • Approving, overseeing, and auditing verifications • Maintaining the offset registry system
Advisory boards	Currently the SLCCS EB plays this role, without any standing advisory committee	Advisory boards generally would develop technical guidelines and rules for specific topics (e.g., forestry, standardization, accreditation of auditors), but this has not been required so far under the SLCCS and there is no specific body in place
Third-Party Auditors	Currently SLCF does validation and verification, but other entities could also be accredited	<ul style="list-style-type: none"> • Validate project applications • Verify project performance and reported emission reductions

Source: SLCCS General Program Guide, interviews with SLCF staff

Projects that meet SLCCS's eligibility criteria are registered and issued credits that can be sold and traded in the domestic market. It is envisioned that the scheme could support voluntary emission reductions that can help environmental conscious Sri Lankan companies achieve its carbon neutrality goal. The scheme also has a potential to incentivize projects for the blue-green development under Sri Lanka's Next Program. Table 13 describes how credits are expected to be measured, registered and issued under SLCCS.

Table 13. Key steps of the SLCCS project cycle

Step	Body	Description
Project registration/listing		
Select methodology	Project developer	The project developer selects a crediting methodology, which could be a SLCCS methodology or internationally recognized methodologies, such as those under the CDM or Verified Carbon Standard (VCS). Once the project developer submits a registration request to the SLCCS, the

		project will be listed on SLCCS's project pipeline. The project developer would then complete the Carbon Management Assessment (CMA) using the format given in the SLCCS official website.
Validation	SLCF or other accredited auditor	Detailed assessment of the proposed offset project would then be implemented by third party validation/verification bodies in order to evaluate whether the project meets the offset program requirements and standards. Validation may include an evaluation of baseline determination, additionality testing and monitoring plans. A detailed review would then be conducted to ensure that the project application, including validation report (where relevant), is complete and consistent with program rules and that all legal requirements have been fulfilled.
Project Registration	SLCCS EB	Once the project is validated, accredited validation and verification Bodies shall submit the CMA and Validation Report, which includes details on the estimated emission reduction or removal, to the SLCCS's Executive Body. Project information will be listed on SLCCS's webpage when the projects are registered (currently under revision).
<i>Project verification and issuance</i>		
Monitoring	Project developer	The project developer will then monitor and measure the GHG emission reduction or removals. All information for a given monitoring period will be documented in a monitoring report, using the SLCCS template. The monitoring report must be validated and verified by the relevant accredited body.
Verification	SLCF or other accredited auditor	Verification is typically conducted by a third-party auditor at regular intervals after project implementation, as specified by the protocol and project type. Verification may be followed by another completeness check.
SCER/SCER+ Issuance	SLCCS EB	Once the project is verified, the accredited validation and verification body shall submit the monitoring report and verification report to the SLCCS EB, which includes information on the verified GHG emission reduction or removal. Credits will be provided for Sri Lankan Certified Reductions (SCER) or SCER+, once the project receives the final approval from the SLCCS EB. SCERs can only be used for offsetting within an organization, while ownership of SCER or SCER+ units can be transferred through SLCCS's registry to other entities that may wish to offset their GHG emissions.

Under this scheme, so far only three projects are registered. All three registered SLCCS projects are small scale hydropower projects, while one (Kirkoswald) has also been registered as a CDM project 30 December 2013. The list of projects is shown in Table 14.

Table 14. Projects registered under the SLCCS

	Capacity (MW)	Emissions reductions (tCO ₂ /yr)	Status	Start Date	Crediting Start	Crediting End
Kirkoswald Small Scale Hydropower SLCS Project	4	8861	Issuing	10/2/2010	6/12/2011	30/12/2013
Dilmah (Ceylon Tea Services) Small Scale Hydropower Bundle Project	0.9	3182	Planning	Registration Date	10 year	10 yrs
Bogawanthalawa Small Scale Hydropower Project	1.5	3789	Issuing	10/2/2010	10/2/2010	10 yrs

In terms of regulatory mandate, SLCF, which is under the MMDE, oversees the program. SLCF issues the “General Program Guide” for SLCCS. The SLCCS project cycle includes stakeholder consultation, unless this already occurred for the CDM, and this consultation may happen up to the time of verification. Although documentation is not currently online, the intention is to have all relevant information available through the SLCCS website in the future. Only SCER+ units may be transferred to another organization (i.e. SCER units are used only for internal offsetting within an organization). SLCF oversees the administration of transfers through their own manual-based registry.

Whilst governance and administration arrangements for implementation of the scheme are well recognized, the implementation arrangements for the scheme are short of requirements due to lack of awareness about the scheme and lack of legislative and administrative support. In addition, domestic market for credits remains relatively underdeveloped due to a number of reasons. The most important of these is the lack of significant, predictable demand for the credits from the current domestic market. SLCCS credits which have currently been purchased from three projects under the scheme, mainly for the purpose of carbon neutrality in the private sector. As such, because there is no mandate or requirement for companies to offset their emissions, domestic demand has so far been limited. However, although demand has been minimal, there is a general preference by the private sector for domestically originated credits rather than international credits, whereby financial support for climate action remains within the country.

Additional barriers to the uptake of the SLCCS include the limited commercial, technical, institutional and financial capacities to develop the market. Furthermore, the current system of relying on the same organization to administer the program, support project developers, and conduct verification also limits the potential for expansion and could weaken the credibility of the scheme. The high transaction cost and lack of transparency on the rules and procedures in project-based credit systems such as the CDM have also reduced private sector participation and market liquidity. The key challenges and needs of SLCCS are further assessed in BB4 under 4.1 “Needs and opportunity assessment for SLCCS”.

2.2.2 CDM

2.2.2.1 Objectives

In addition to SLCCS, Sri Lanka has also gained carbon markets experience at the international level through the CDM. The CDM 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 primary objectives of Sri Lanka's participation in CDM are to incentivize emission reduction activities that are in line with sectoral priorities, promote inward transfer of new and proven low carbon technologies, and contribute to Sri Lanka's sustainable development goals.

2.2.2.2 Governance framework and key design features

To facilitate Sri Lanka's participation in CDM, the **National Framework Policy for CDM** is currently being developed to establish the institutional, technical and legislative framework needed to develop and trade CDM projects. The CCS acts as the Secretariat for the Designated National Authority (DNA) for the approval of CDM projects. To help develop CDM projects, CCS is promoting private sector participation in CDM projects through capacity building activities and outreach, while SLCF is also providing and enhancing access to capital funding for CDM projects. Furthermore, the SLSEA functions as a National Technical Service Agency for CDM, with the purpose of providing technical assistance to the DNA and project developers in the energy sector.

While Sri Lanka has introduced a well-rounded institutional framework for CDM and has identified significant opportunities to develop CDM projects in the energy, industry, transport, waste management, agriculture, forest management and plantations sectors, international demand for CERs from CDM projects is currently limited. According to UNEP DTU Partnership's CDM Pipeline Analysis, only 10 CDM projects and 1 CDM PoAs have issued CERs.

This is primarily due to the fact that emission reduction projects in Sri Lanka are relatively small, and as a result, are less attractive to buyers in international markets. Other challenges include lack of awareness, high administrative costs of verification and issuance and challenges in identifying capital investments for projects (Batagoda, 2002). Furthermore, as shown in

Table 15 below, a number of projects were not successful in the registration process. The two registered CDM PoAs include two more successful composting projects and five small-scale hydropower projects.

Table 15. Registered and unsuccessful CDM projects

Project type	Registered	Unsuccessful
Biomass power: agricultural residues	1	4
Biomass power: forest biomass		2
Biomass power: gasification	1	1
Biomass power: palm oil solid waste		1
Cement: clinker replacement		1

Charcoal production	1	
Composting		1
Forest residues: sawmill waste		1
Landfill gas power	1	
Small scale hydropower	12	13
Small scale wind power	4	2
Total	20	26

Note: unsuccessful = rejected, validation terminated, validation negative or withdrawn

Source: UNEP DTU Partnership, 2017

Despite these barriers, Sri Lanka's experience in the CDM has offered important lessons that could support the country and private sector's market readiness in the future at the international level. For example, through building institutional capacity for CDM, Sri Lanka has significantly improved the data management and validation processes and has thus, contributed to enhancing the credibility, transparency and quality of emission reduction efforts within Sri Lanka. Furthermore, registered projects that have not been issued CERs may offer a ready pipeline of carbon assets for any future domestic and international CPIs.

2.2.3 NAMAs

NAMAs are actions proposed by developing country Parties to reduce emissions below 2020 BAU level. NAMAs are generally supported by industrialized countries, and are aligned with sustainable development goals as interpreted by the respective host country. Unlike CDM which is guided by strict rules and protocols, there is no internationally defined or agreed NAMA cycle and rules. However, there are some common steps that can be broadly grouped into three phases: concept, development and implementation. Furthermore, NAMA generally focuses on larger-scale emission reduction programs/policies and many are guided by economy or sector-wide goals.

As a developing nation, Sri Lanka considers NAMA to be a key measure in achieving the country's twin goal of reducing emissions while addressing domestic growth and development objectives. Sri Lanka is currently developing two NAMAs (one in the energy sector and one in the transport sector), as detailed below.

2.2.3.1 Energy NAMA

2.2.3.1.1 Objectives

The primary objective of the energy sector NAMA is to demonstrate the application and usefulness of a MRV system and develop a robust, transparent and functional NAMA framework for the planning, implementation, accounting, registration and management of mitigation solutions.

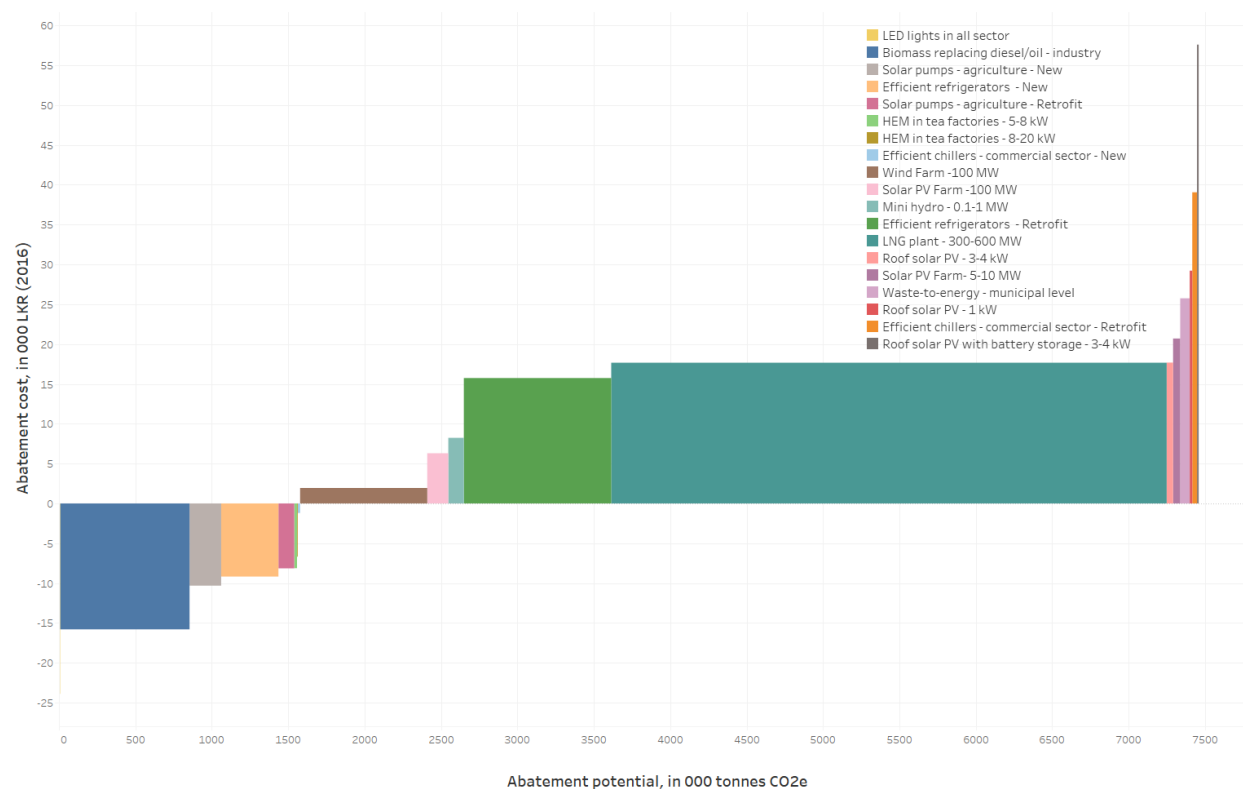
2.2.3.1.2 Governance structure and key design features

This NAMA is a 4-year project executed by the Ministry of Power and Renewable Energy, and developed by the SLSEA and the United Nations Development Program (UNDP). The project is co-funded by the Global Environmental facility (GEF), UNDP, and the Government of Sri Lanka.

As part of the NAMA framework, the project aims to establish national and sub-national level baselines, prioritization of NAMAs through a Marginal Abatement Cost Curve (MACC) tool and establish a strong inventory and MRV system. These key components of the NAMA framework will help quantify GHG savings and benefits of mitigation interventions using a bottom-up approach to aggregate from the provincial and sub-sector levels to the sectoral and national level. Three pilot projects on High Energy Efficiency motors, solar PV net metering system and biogas digesters will be implemented to test out the provincial and sub-sector level inventory and MRV systems.

The MACC tool developed for the NAMA could be a mean to measure the mitigation potential and cost-effectiveness of sub-sectors and major technological areas in the energy sector. This form of analysis could potentially be useful for the BB2 analysis, even though a more detailed assessment should be conducted during the MRP implementation phase.

Figure 23. Energy sector MACC for Sri Lanka (2030)



Source: UNDP and SLSEA, 2017

2.2.3.2 Transport NAMA

2.2.3.2.1 Objectives

This NAMA focuses on introducing and adopting electric buses instead of conventionally fueled buses in the planned BRT system on Galle Road in the Colombo Metropolitan Area. In doing so, it aims to contribute to multiple climate and sustainable development objectives, such as energy security,

improved access to transportation, improved air quality and local job creation, GHG emission reduction, among others.

2.2.3.2.2 Governance structure and key design features

Implementation of the NAMA will be led by the Ministry of Transport as the NAMA Coordinating Authority. The MMDE has been appointed as the NAMA Focal Point to the UNFCCC and as the National Designated Authority (NDA) to the GCF. The Ministry of Transport, along with the Ministry of Finance and Development Finance Corporation of Ceylon, will take up the role of the NAMA Implementing Entity. The Sri Lanka Transport Board will act as the supervisory board for the National Executing Entities which are the private operators responsible for the operation of the eBuses (electric buses) on the BRT (MMDE and UNDP, 2016)

The NAMA shall adopt and operate 100 electric buses on the Galle BRT in place of the conventional diesel fueled, articulated buses. Activities to support this goal shall be divided into two phases:

- **Phase 1 (Pilot):** This shall involve introducing 10 eBuses, owned by the Government of Sri Lanka and operated by private sectors, as directed by the Ministry of Transport, into the Galle BRT. The purpose of Phase 1 is to generate awareness about the NAMA and invite private sector participation. In addition, Phase 1 shall also include extensive capacity-building measures and awareness programs.
- **Phase 2 (Full scale operation):** The remaining 90 eBuses will begin on the Galle BRT, all of which will be owned and operated by private operators. In order to receive funding under the NAMA, every eBus operator needs to meet the eligibility criteria set out under the NAMA.

Since these NAMAs are still in the early concept/development phase, it is difficult to draw lessons learned from Sri Lanka's NAMA experience. The challenges faced for each NAMA would also largely depend on the sector covered. Nevertheless, one of the main challenges NAMA developers are faced with in general is the lack of financial support to pass from the development and design stage to the implementation stage. So far, the NAMA Facility has provided the largest part of financing for NAMAs. Another financial boost could be other climate financing such as the Green Climate Fund (GCF). Another potential challenge is the lack of clarity on approaches and methods used for estimating mitigation outcomes from NAMAs that are broader than project activities, and thus resulting in a lack of comparability between the performance of different NAMAs.

2.2.4 CPF

2.2.4.1 Objectives

Sri Lanka has a significant pipeline of existing approved renewable energy projects but with a varying success rate for the different technologies. If a greater share of these projects could move from approval stage to implementation, generation from renewables could be significantly enhanced. The Government is making concrete plans for increasing the share of power from renewable energy within the next 5 years. To support these goals, the World Bank's CPF aims to provide a methodology to monitor, report and verify the generation of emission reduction from the expansion of renewable power that includes wind, solar and biomass plants.

2.2.4.2 Governance structure and key design features

The program will be coordinated by CEB, which as mentioned in BB1, is a state-owned utility that owns and operates 65% of Sri Lanka's electricity generation system and the entire transmission network. The program, with its methodological approach that proposes to establish aspirational targets to monitor the progress with achievement of NCRE development, will operate at the sector level so as to facilitate better planning and monitoring of implementation arrangements. Through this, the program is expecting to support efforts to increase the share of renewable energy generation using climate finance and the development of appropriate methodologies and MRV systems. This will help to reduce Sri Lanka's dependence on fossil fuels, to systematically communicate its achievements on climate change and to strategically apply for international support.

2.2.5 REDD +

2.2.5.1 Objectives

In 2013, the MMDE launched the UN-REDD Program to help Sri Lanka prepare for REDD+ (Reduce Emissions from Deforestation and Forest Degradation "plus"). REDD+ is an international voluntary mechanism through which developing countries are rewarded financially for emission reduction from deforestation, forest degradation, conservation and enhancement of forest carbon stocks, and sustainable management of forests (UN, 2013).

2.2.5.2 Governance structure and key design features

The Forest Department of MMDE, with support from CCS, is leading the implementation of the UN-REDD National Program. Participating international organizations include the Food and Agriculture Organization (FAO), UNDP and UNEP. In 2015, MMDE successfully implemented several action plans under the program, including the development of a National Forest Monitoring System, a REDD+ Roadmap, and a needs assessment for the development of Forest Reference Emission level/Forest Reference Level (FREL/FRL). The Policies and Measures Task Force and the Academics and Researchers Forum were also established to support stakeholder engagement and coordinate inputs to the strategy development process (UN-REDD Program, 2016).

PMR activities do not cover REDD+, since as mentioned, other initiatives such as the World Bank's Bio Carbon Fund (Bio CF) and Forest Carbon Partnership Facility (FCPF) are currently supporting AFOLU-related activities. Nonetheless, activities supported by BB2 and BB3 should make reference to ongoing REDD+ activities, and establish linkages between MRV frameworks developed under the MRP and those created through REDD+ supported projects.

2.2.6 Concluding remarks

Sri Lanka's market experience to date are highest for project-based crediting mechanisms. While the SLCCS is nascent, the set-up of a domestic crediting is the result of high-level political commitment to mobilize resources for domestic emission reduction projects. At the international level, the National Framework Policy for CDM is also being developed to establish the institutional, technical and legislative framework required to develop and trade CDM projects.

Most of the in-country capacity on MRV is related to project-based financing given Sri Lanka's experience with the CDM and other markets. However, Energy and Transport NAMAs, as well as the CPF project, could build capacities at the sector/subsector and program level. Since these projects are at the

preparatory stage, careful coordination will be required to explore synergies with these activities and avoid overlap.

2.3 Activities, deliverables and proposed budget

As mentioned, a key purpose of BB2 is to identify analytical work to provide a clear rationale and context for supporting the activities under BB3 and BB4.

A key component of BB4 is to strengthen the SLCCS. There are several reasons for supporting SLCCS, even before the completion of the analysis under BB2:

- **Leverages strong political commitment.** While the SLCCS is still nascent, the policy decision to have a domestic crediting scheme and process of developing and launching the scheme has political support and has been ongoing for several years. The President of Sri Lanka also serves as the Minister of the MMDE, and the Ministry is committed to exploring scaled-up crediting as a CPI. Positive support from key stakeholders has already been obtained through the two stakeholder workshops held in May and July 2017, as well as bilateral meetings during the MRP preparation phase. Notably, MMDE as well as key stakeholder groups from both public and private sectors have provided provisional support to the scheme (Please see the “Background” section for further details on the consultation process during the MRP preparation phase).
- **Builds on existing experience, both positive and negative, from CDM and other markets** and expand the mitigation impact of these interventions.
- **Build on underlying facility- and project-level data collection and management capacities.** These have stand-alone benefits, in addition to supporting CPIs. For example, in the medium run, it could enhance accessibility to international RBCF, and potentially build capacity to respond to transparency and reporting requirements under the Paris Agreement.
- **Enhance readiness to participate in new international market mechanisms under Article 6 of the Paris Agreement.** In the long run, it is envisioned that Sri Lanka’s crediting experience could provide an opportunity for the country to influence the negotiations on the operationalization of market mechanisms under the Paris Agreement.

A key objective of the analytical work under BB2 is therefore to inform the objectives, scope and strategies for enhancing the SLCCS. However, since the ultimate objective of BB2 is to design an optimal policy package for NDC implementation, BB2’s analysis should also explore whether an additional CPI would be required to support NDC goals. In terms of explicit CPI options, carbon pricing typically refers to ETS and carbon taxes, but also includes scaled-up crediting at a domestic or international level in the context of PMR activities. This outputs from BB2 would evaluate which additional CPIs could be the most suitable as part of the optimal policy package to achieve NDC goals.

Key considerations when selecting a CPI would include the ‘FASTER’ principles of successful carbon pricing (World Bank, 2015 d):

- **Fairness:** Successful carbon pricing policies reflect the “polluter pays” principle and contribute to distributing costs and benefits equitably, avoiding disproportionate burdens on vulnerable groups.
- **Alignment of Policies and Objectives:** Successful carbon pricing policies are part of a suite of measures that facilitate competition and openness, ensure equal opportunities for low-carbon alternatives, and interact with a broader set of climate and non-climate policies.

- **Stability and Predictability:** Successful carbon prices are part of a stable policy framework that gives a consistent, credible, and strong investment signal, the intensity of which should increase over time.
- **Transparency:** Successful carbon pricing policies are clear in design and implementation.
- **Efficiency and Cost-Effectiveness:** Successful carbon pricing improves economic efficiency and reduces the costs of emission reduction.
- **Reliability and Environmental Integrity:** Successful carbon pricing schemes result in a measurable reduction in environmentally harmful behavior.

In addition, to increase the impact on NDC goals, the selection of a new CPI should consider the following:

- **GHG mitigation potential, other SD and environmental benefits:** the potential to mitigate GHG emissions from the CPI and achieve other co-benefits
- **Ease of Implementation:** including issues such as availability of data in the sector and feasibility of MRV, determination of baselines, etc.
- **Political and social acceptance:** acceptance of the instrument by all relevant stakeholders in the sector, including the private sector.

The scope and objectives of the enhanced SLCCS and the new CPI should be optimally selected to accommodate different economic, social and environmental goals. The strategic decisions for the SLCCS, for example, and how these relate to other CPIs, are illustrated in Box 1. CPIs coexist with a range of non-climate policies that can support or undermine the transition to a low-carbon economy. In reality, carbon pricing policies will coexist with a suite of other measures that are designed to each multiple social and economic objective. Some of these policies will be complementary, supporting the deeper emissions reductions over time. Others will be counter-productive, weakening the carbon pricing signal. Policy coherence across a range of policy areas is therefore important for ensuring the effectiveness of CPIs (Gouvello, Finon, & Guigon, 2017). The annexure 1 shows a general list of actions that have been undertaken by other countries to support emission reductions in the energy, industry, transport and waste sectors. These policies are categorized as carbon pricing, non-carbon pricing, command-and-control, technology development support, financial instruments and direct public investment.

Box 1. Strategic choices in the objectives for an enhanced SLCCS

The future of the SLCCS and any other CPIs in Sri Lanka are closely intertwined, because crediting is not an end by itself, but is rather a tool to meet larger policy goals (e.g. NDC implementation and sectoral policy goals) by providing performance-based incentives for mitigation activities.

The first issue is whether the crediting program is used on its own, or as part of a cost containment measure for an ETS, carbon tax or another instrument. Some countries, for example, use a domestic crediting scheme to allow companies with obligations under a carbon tax or ETS to “offset” some of those obligations and meet their targets at a lower cost. This is case, for example, in the planned carbon tax system in South Africa (World Bank, 2015 b).

The related second issue is how much of the crediting outcomes are needed to meet NDC goals and how much might be traded under the international market mechanisms under the Paris Agreement. While the negotiations on trading under Article 6 of the Paris Agreement will take several years, one important emerging issue is how international trading may relate to meeting NDC goals. The Paris Agreement requires that for any transfer of tradable units a “corresponding adjustment” is made so that only one country counts the mitigation outcomes towards their NDC goals. In other words, if the units are transferred and the buying country uses them for compliance with their NDC goals, then this amount of emissions would be added back to Sri Lanka’s GHG inventory (or some similar process) (Spalding-Fecher, Sammut, Broekhoff, & Füssler, 2016). This means that it is unlikely that Sri Lanka could use international crediting to achieve their *unconditional* NDC goals or targets, because the “corresponding adjustments” would always add back these emission reductions to their inventory (Schneider, Spalding-Fecher, & Cames, 2015).

The third issue is related to the type of international demand. While the purchase and *transfer* of credits from an international buyer, as discussed above, would require “corresponding adjustments”, this would not be the case for results-based climate finance (RBCF). RBCF is form of international financing that does not result in the transfer of units, but still uses some form of certification system to verify emission reductions and reward them with ex-post payments (World Bank, 2017 c; Schneider, Spalding-Fecher, & Cames, 2015). This is in contrast to most climate finance, which is provided in the form of upfront grants, loans or other financial instruments (Spalding-Fecher, Sammut, & Ogunleye, 2015). A recent World Bank report concluded that, “RBCF facilitates carbon pricing and market building, supports host countries’ policy processes to achieve their NDCs, and leverages private sector activity and financing.” (World Bank, 2017 c).

With PMR’s support, analytical work will be carried out as part of BB2 to better understand the potential implications and trade-offs of new mitigation policy options (both carbon pricing and non-carbon pricing) and implementation strategies for the electricity, transport, industry and waste sectors. The key objective of the proposed preparatory work is to develop an optimal policy package that could efficiently support the implementation of Sri Lanka’s NDC goals. In this context, it would be important to ensure that activities proposed under BB2 are aligned with Sri Lanka’s Readiness Plan for Implementation of NDC (2017 – 2019).

Against this backdrop, BB2 aims to provide two key pieces of analytical work to achieve this goal. The work will be informed by macroeconomic assessments and desk-based analysis that have been initiated at the MRP preparation phase, as well as stakeholder consultations which would be conducted under BB5.

Output 2.1 Assessment of mitigation potential in different sectors and identification of suitable CPI(s) for potential sectors. This would first involve conducting a comprehensive macroeconomic assessment using suitable modelling techniques to evaluate the emission reduction potential (building on preliminary assessment conducted during the preparation phase) for the energy, transport, industry and waste sectors. The second component considers the suitability of CPI(s) to address policy gaps based on the FASTER principles and other considerations mentioned above. The final component explores the potential role of identified CPI(s) in achieving NDCs.

Output 2.2 Assessment of policy options and need for policy and regulatory measures to support implementation of CPI(s). The second output aims to first evaluate the potential interactions between new and existing policy options. Based on the analysis, a roadmap would be developed to identify key steps for the design and implementation of an integrated policy package. Activities in the roadmap may include identifying the scope, nature and sectors covered for the proposed CPI(s); identifying the need for inter-agency collaboration; developing a monitoring framework to track progress of the policy instruments, among others. Activities and strategies developed should be in line with the Readiness Plan for NDC implementation.

2.3.1 Objectives

The objectives of BB2 are to:

- a) Identify policies, including CPIs, that are most suitable to achieve NDCs and development goals in the electricity, transport, industry and waste sectors; and
- b) Understand the interactions between existing and planned policies to develop an optimum policy package, at a high level, to achieve climate and sustainable development goals, where the design of new CPI(s) will be taken up in BB4, Part II

2.3.2 Outputs, activities and deliverables

Output	Rationale	Description	Deliverables	Responsibility
Output 2.1 Assessment of mitigation potential in different sectors and identification of suitable CPI(s) for potential sectors	To evaluate the potential role of CPIs in supporting NDC implementation in priority sectors	2.1.1 Macroeconomic assessments using modelling techniques to measure the mitigation potential of sectors/subsectors and technologies 2.1.2 Evaluate the suitability of CPIs for prioritized sectors/subsectors and technologies 2.1.3 Assess the potential role of CPIs in supporting NDC implementation	<ul style="list-style-type: none"> Stakeholder consultations Input/output data Emission trajectories List of prioritized sectors/subsectors and technologies based on mitigation potential Report with identification of potential CPI(s), based on stakeholder consultation, GHG assessment and desk-based analysis being initiated at the MRP preparation phase 	CCS
Output 2.2 Roadmap for designing and implementing an optimal policy package	Identify key steps for the design and implementation of an integrated policy package	2.2.1 Evaluate the interaction between new and existing measures in order to understand the coherence of the overall climate policy mix 2.2.2 Produce a high-level roadmap for optimal policy package that would potentially include a new CPI alongside the SLCCS. This may involve developing a work plan to identify key activities that could be undertaken in BB4 (Part 2) for the design and implementation of additional CPIs.	<ul style="list-style-type: none"> Report which evaluates the coherence of the overall policy mix Roadmap 	CCS

2.3.3 Timeline

Output	2018			2019			2020		
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Output 2.1 Assessment of mitigation potential in different sectors and identification of suitable CPI(s) for potential sectors									
Output 2.2 Roadmap for designing and implementing an optimal policy package: Assessment of policy options and need for policy and regulatory measures to support implementation of CPI(s)									

2.3.4 Budget

Output	Estimated support from PMR (US\$)			Funding Source (US\$)		
	Year 1 (2018)	Year 2 (2019)	Year 3 (2020)	PMR	Government	Total
Output 2.1 Assessment of mitigation potential in different sectors and identification of suitable CPI(s) for potential sectors	251,000	89,000	0	340,000	34,000	374,000
2.1.1 Macroeconomic assessments using modelling techniques	144,000	36,000	0	180,000	18,000	198,000
2.1.2 Evaluate the suitability of CPIs for prioritized sectors/subsectors and technologies	72,000	18,000	0	90,000	9,000	99,000
2.1.3 Assessment of their role to support NDC implementation	35,000	35,000	0	70,000	7,000	77,000
Output 2.2 Roadmap for designing and implementing an optimal policy package	112,500	112,500	0	225,000	22,500	247,500
2.2.1 Evaluation of overall policy coherence	62,500	62,500	0	125,000	12,500	137,500
2.2.2 Roadmap for designing and implementing optimal policy package	50,000	50,000	0	100,000	10,000	110,000
Total	363,500	201,500	0	565,000	56,500	621,500

3. Building Block 3 – Core Technical and Institutional/Regulatory Readiness Components to support implementation of Carbon Pricing

*BB3 outlines the requirements for four core market readiness components: (a) the various levels of **data** collection, analysis and management that will underpin CPIs (b) a **national MRV system** that uses this data and appropriate methodologies to demonstrate the impact of mitigation actions on the achievement of NDC goals in key sectors (i.e. electricity generation, transport, industry and waste) and (c) a **registry system** that serves a dual purpose of data management and transaction registry, and (d) the **regulatory and institutional frameworks** the data collection, MRV and registry systems. Furthermore, BB3 provides a roadmap of how the MRV system and registry may be designed and implemented, taking into the consideration the ongoing policy development process under BB2 to identify the full range of CPIs that will be recommended for Sri Lanka.*

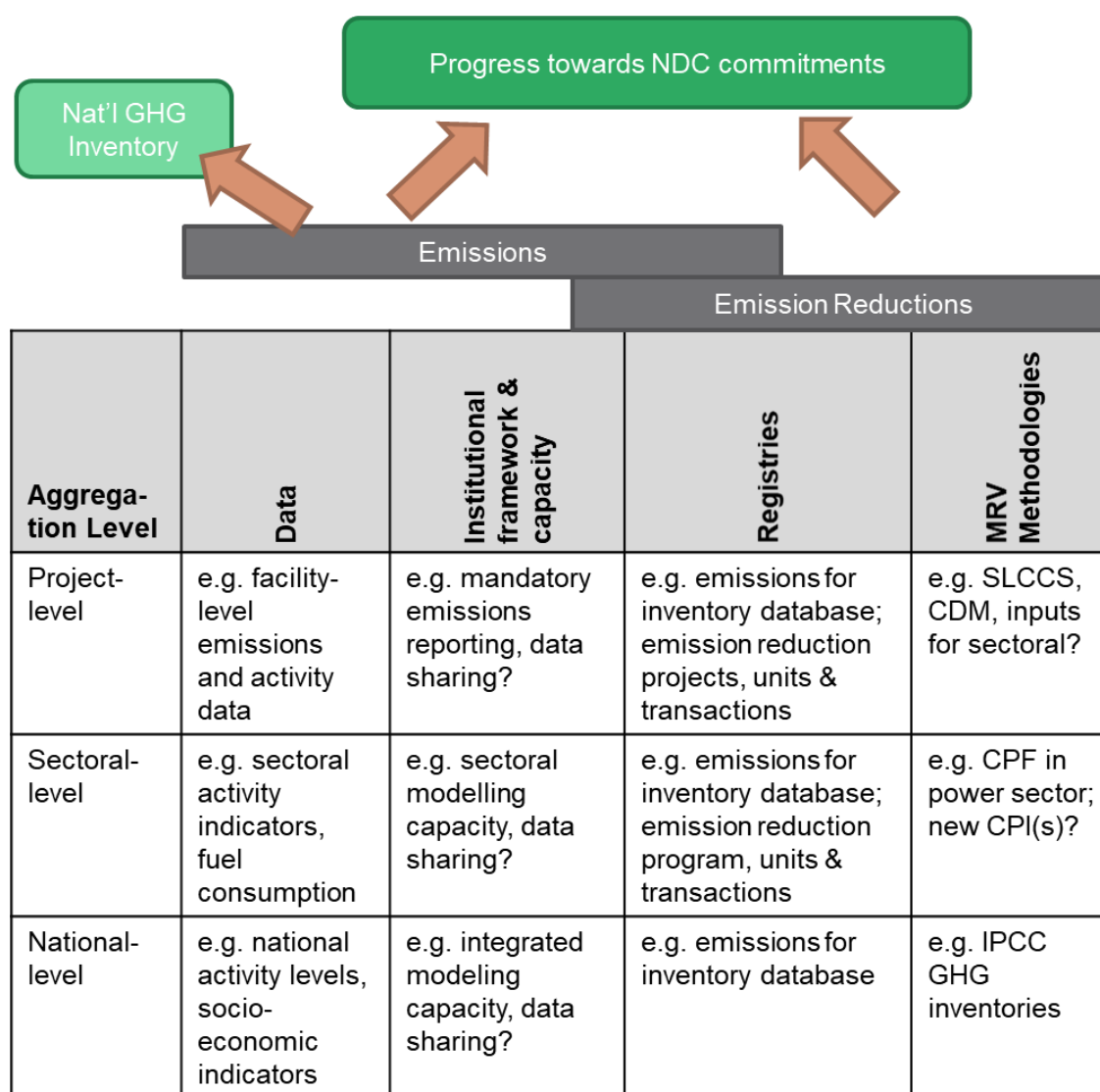
3.1 Introduction

Typically, MRPs include the following components, from which countries select which are most relevant to the current needs for developing CPI(s): Data; Goal-setting; MRV system; Registry/tracking tool; Regulatory Framework & Institutions. The content of each of these components is then developed based on the set of policies, including CPIs, that they support, including tracking overall progress towards NDC goals. This means that the analysis of the optimal mix of policy instruments in BB2 is important for informing the needs and requirements of the other readiness components in BB3. In the case of Sri Lanka, the limited time available for MRP implementation (i.e. two years) means that many BB2, BB3 and BB4 activities must be implemented in parallel to be completed within the required timeframe. For BB3 activities to start immediately with MRP implementation, the focus must therefore initially be on the readiness components that will be important regardless of the final choice of CPIs, as well as components that could support the enhanced SLCCS (although even the full scope of this will not be decided until during MRP implementation). The requested support under BB3 will therefore focus initially on data collection at facility-level, as well as MRV and registry tools for facility- and project-level emission reductions.

3.1.1 Overall framework and definitions of key components

BB3 in this MRP is therefore divided into four main components: (a) enhancing the data collection systems, particularly for facility-level data related to GHG emissions and emission reductions (b) establishing an integrated national MRV system; (c) developing a registry for data management and/or transactions, and (d) developing the institutional and regulatory framework to support all of these other activities, including regulations on emissions reporting. These components, and how they support policy goals such as tracking NDC progress and reporting GHG inventories are illustrated in Figure 24, with the focal areas for this MRP highlighted in dark blue. In other words, the work under BB3 would lay out an overall framework for an integrated MRV system, but would focus on developing those core components that serve a variety of existing and future policy instruments.

Figure 24. Framework for core readiness components



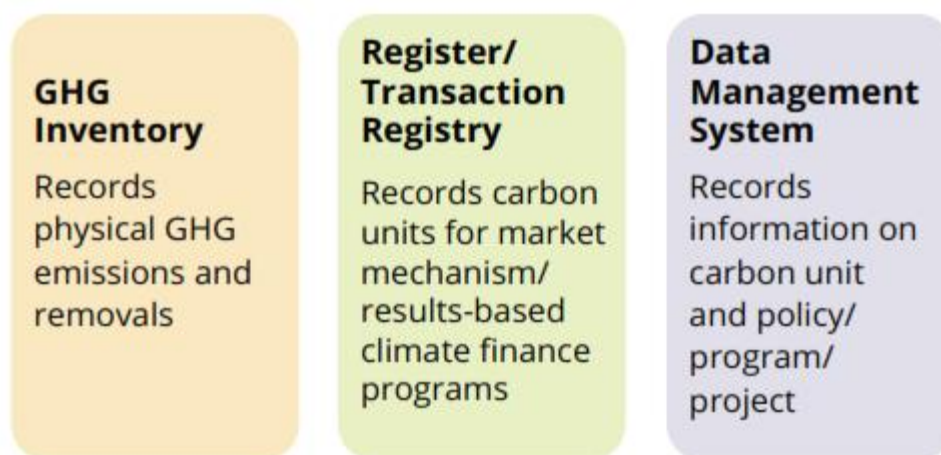
While the need for reliable data collection and coherent institutional frameworks may be obvious, the components of MRV and registries need some definition:

- MRV methodologies and system:** Measurement/monitoring (M) is defined as the process of collecting data and information related to GHG emissions and mitigation actions. Reporting (R) refers to the compiling of information in standardized formats to make it accessible to a range of users and facilitate public disclosure of information. Verification (V) refers to the periodic review or independent assessment of the reported information to establish completeness and reliability. A differentiation can be made between two key types of MRV methodologies:
 - MRV of GHG emissions:** This refers to estimating, reporting and verifying actual, absolute emissions and removals at the facility-, sectoral- or national-level over a defined period of time (e.g., per year);
 - MRV of mitigation actions:** This involves assessing (ex-ante and/or ex-post) GHG emission reduction effects of policies, programs and projects, as well as monitoring their implementation progress. Unlike MRV of GHG emissions, this involves assessing

progress towards mitigation goals and estimating a baseline against which mitigation is achieved, rather than solely measuring absolute GHG emissions (Singh, Finnegan, & Levin, 2016).

- **Registry for data management and/or transactions:** The figure below illustrates three main types of registry systems, which can be summarized as follow:
 - **GHG inventory database:** records physical GHG emissions and removals, but does not account for carbon units;
 - **Unit or transaction register:** usually a database that records serialized carbon units⁸ and any other information specific to the carbon unit required by policy. Such a register may also be used by a country as part of receiving RBCF for generating carbon units backed by emission reductions, specifically to provide assurance that the same emission reduction activities are not paid for twice. A **transaction registry** is a more advanced tool, with all the features of a unit registry, plus the capability to transfer carbon units between multiple account holders within the transaction registry (internal transfer), and/or the capability to transfer carbon units to another transaction registry (external transfer);
 - **Project/program data management system (DMS):** database that records and archives specific information about an emission reduction project and/or carbon unit that is not stored in the unit/transaction registry, but that for policy reasons is required to transparently demonstrate environmental integrity, and compliance with safeguards and other conditions.

Figure 25. Three main types of emissions accounting systems



Source: adapted from (World Bank, 2016 a)

3.1.2 Policy basis for core readiness component needs

3.1.1.1 The Paris Agreement

A key driver of the need for an integrated system of data collection, MRV and registries, is Sri Lanka's commitments under the Paris Agreement, and the need to track progress towards achieving those commitments (see Figure 24). As mentioned in BB1, Sri Lanka's NDC includes separate commitments on

⁸ The term "carbon unit" has the same definition as that used in the "PMR/FCPF, Emissions Trading Registries: Guidance on Regulation, Development, and Administration", and refers to the following four categories: (i) allowances, (ii) carbon credits, (iii) voluntary credits and (iv) compensated results (i.e. emission reductions paid for under RBCF programs).

mitigation, adaptation, loss and damage, and means of implementation. The actions for mitigation focus on reducing GHG emissions against a BAU scenario in the sectors of electricity generation, transportation, industry, waste and forestry. The full NDC presents separate actions in 14 sectors across mitigation and adaptation (e.g. Energy, Transport, Health, Water).

As discussed in BB1, Sri Lanka has prepared “Readiness Plan for the implementation of NDCs” (MMDE, 2016 b), which provides recommendations on the implementation of the actions in each sector, the need for improvements in human and technical capacity, as well as financial and technical support to implement the actions by 2020. The implementation plan acknowledges that “a host of groundwork and preparations need to be carried out to ensure successful implementation of NDCs to achieve the set GHG emission reduction targets by 2030”. The plan identifies thirteen elements of focus for the readiness phase, a number of which are directly related to the need for a national MRV system, as summarized below (numbering reflects that used in the Readiness Plan):

- 4. Baseline setting: identify baseline conditions of GHG emissions for each action by taking 2010 as the base year. This readiness task must be completed in the preparation phase for effective implementation of the NDCs.
- 10. KPIs: Each commitment or goal needs a SMART (Specific, Measurable, Achievable, Realistic and Time bound) output based on Key Performance Indicators (KPI) to track the progress of its key activities. These KPIs should not be GHG emission reduction targets but milestones contributing to the realization of GHG emission reduction targets.
- 11. MRV: Identify an internationally acceptable and nationally executable MRV system to track the GHG emission reduction targets of each commitment, including through existing mechanisms for MRV of climate change-related projects and activities.
- 12. Aggregation: Respective Ministries shall monitor the progress of GHG emission reduction of each commitment at Ministry level using the MRV system. Actions across all sectors will be aggregated for reporting at the national as well as international level. The CCS or proposed Climate Change Commission will be tasked to achieve this.

The NDC further emphasizes the support needed for implementation of the NDC commitments, and identifies finance as one of the three pre-conditions for implementation of the individual NDCs. Specifically, with respect to finance, the “Readiness Plan” notes that:

“In the implementation of the NDCs, and resource mobilization for their implementation, a transparent and accountable means of monitoring and reporting, as well as verification needs to be set up. This could be developed at the country level to reflect the international standards of MRV as per the Paris Agreement, and adapted to the countries needs and capacity for implementation.”

In summary, the “Readiness Plan” highlights the importance of an MRV system for tracking progress toward NDC goals that meets the following objectives:

- To transparently and accurately determine the BAU scenario and associated GHG emissions against which unconditional and conditional NDC targets can be evaluated;
- To transparently and accurately track the GHG emission reductions of each NDC action against stated targets, including through existing mechanisms set up for MRV of climate change-related projects and activities;
- To integrate any international standards as required by the Paris Agreement, but be adapted to the county’s needs and capacity for implementation;

- To monitor and report on KPI other than GHG emission reductions to track the progress of key activities.

3.1.1.2 Third National Communication (TNC)

Sri Lanka submitted its Initial National Communication (INC) and SNC in 2000 and 2012 respectively. Presently, the CCS is in the process of preparing the TNC to the UNFCCC. A project has been launched for preparation of the TNC, with its main objective being to prepare a comprehensive report on the climate change-related issues. The analysis conducted within the SNC will be updated and extended, which will result in preparation of a comprehensive national report. Furthermore, preparation of the TNC will integrate relevant climate policy objectives into mainstream national and local strategic planning processes.

A national GHG inventory is a key element of the national communication to the UNFCCC. In the context of the UNFCCC, it is a comprehensive listing by source of annual GHG emissions and removals resulting directly from human activities for one year or a number of years. It is constructed from emissions data, fuel consumption data, other activity data and a variety of default factors to estimate emissions and removals of GHGs in all major sectors, the most relevant in Sri Lanka being Energy, Industrial Process & Product, “Agriculture, Forestry & Other Land Use” (AFOL) and Waste.

To prepare a GHG inventory and report GHG emissions in the TNC, Sri Lanka needs to develop a robust and efficient national GHG inventory preparation system to fulfil its obligations under the UNFCCC. In addition, Sri Lanka needs to establish an effective archiving system to ensure sustainability of the GHG inventory process.

An effective MRV system for GHG emissions at the national level, and an accompanying emissions registry, will facilitate the estimating, reporting and verifying of actual, absolute emissions and removals at the national level over the period defined in the TNC. For the purposes of the TNC, the MRV system needs to support the collection of sectoral activity data at regional level to enhance the accuracy of the emission estimates and allow for collation of that data at a national level. The “V” (verification) of the MRV system should also integrate quality assurance and quality control procedures in the different sectors to ensure the accuracy of the inventory estimates.

3.2 Data collection and availability

This section provides an overview of the current data collection systems in Sri Lanka, as well as identifying some gaps in data collection that would be addressed by the proposed MRP activities.

3.2.1 Current systems for data collection for emissions and emission reductions

Sri Lanka has various ongoing GHG reporting mechanisms and activities that incorporate data collection for different sectors, but which are currently fragmented at various levels. An outline of each of the main ongoing GHG data collection and reporting is provided below:

National GHG inventory: Sri Lanka has submitted both its INC (2000) and SNC (2011) to the UNFCCC, and is preparing the inventory for the TNC to be submitted in the first half of 2019⁹. The TNC for Sri Lanka will comprise five main components, one of which is the preparation of the GHG inventory for Sri Lanka. Sri Lanka has so far not submitted any Biennial Update Report (BUR), which should provide an update of

⁹ [http://www.climatechange.lk/TNC_Project/TNC_Calling%20Express%20of%20Interest%20\(English\).pdf](http://www.climatechange.lk/TNC_Project/TNC_Calling%20Express%20of%20Interest%20(English).pdf)

the information presented in national communications. Preparation of the TNC will be based on 2010 data and information.

Energy Balance: the Sri Lanka Energy Balance¹⁰ is compiled by the SLSEA. The first energy balance covers the period 1976 – 1988, and subsequent energy balances have been published on an annual basis up to 2015. The annual report provides key energy statistics for the country related to indigenous energy resources and imported energy resources, energy supply, electricity generation, electricity distribution, and energy demand across all sectors.

SLCCS: The SLCCS is a national initiative that regulates and registers project-based carbon reduction or removal projects in Sri Lanka. The scheme is explained in more detail in BB2 (section 2.2.1).

CPF: As mentioned in BB2, with the World Bank support, Sri Lanka is currently exploring the possibility of market instruments in the power sector through scaled-up crediting. The CPF program will:

- Support institutional development and capacity building to access international climate finance
- Support the development of sectoral methodology and MRV systems for a NCRE target using result-based climate financing

The CPF program is intended to support Sri Lanka in reducing GHG emissions from the power sector by promoting renewable power generation. The program will provide a methodology to monitor, report and verify the of emission reductions resulting from the expansion of renewable power (e.g. wind, solar and biomass). Data collection requirements for the CPF program will be developed within the program budget and timeframe, and so would not be covered under the BB3 support in the MRP.

CDM: As discussed in BB2, a total of 22 CDM projects have been registered in Sri Lanka (20 projects and 2 PoAs), of which ten projects and one PoA have reached CER issuance. The majority of these 22 CDM projects are related to the electricity sector, with only two projects focusing on the waste sector. No projects have been registered in either the industry or transport sectors, although one rejected CDM project in Sri Lanka focused on optimal utilization of clinker by increasing the additives in cement production.

Energy NAMA: As discussed in BB2, this GEF-financed project is managed by the UNDP in Sri Lanka and the SEA and aims to develop a robust and transparent NAMA framework for selecting energy generation and end-use activities, establish baselines for those activities, prioritize NAMA interventions through development of a MACC tool and establish a strong inventory and MRV system to cover the prioritized interventions.

SEA EnerGIS database: The SEA EnerGIS database is a resource inventory compiled for renewable energy resources using a web-based Geographic Information System (GIS). The web-based interface on the GIS system 'EnerGIS' was launched in 2009, and all SEA project management databases were migrated to the GIS platform. EnerGIS allows easier exchange of information between developers and SEA, and now has become the primary tool for identifying sites for energy projects among the developer community.

Transport NAMA: As discussed in BB2, the proposed transport NAMA for Sri Lanka focuses on the promotion and adoption of electric buses for BRT, addressing the reduction in GHG emissions alongside multiple sustainable development objectives such as increased energy security, improved access to

¹⁰ <http://www.info.energy.gov.lk/>

transportation, improved air quality and local job creation. The “NAMA Design Document for the Transport Sector of Sri Lanka” presents the parameters to be monitored for the Sri Lanka transport NAMA, such as distance travelled per bus, number of buses in operation (likely 100), and emissions per bus.

Note that CCS has also produced a report on “Technology Needs Assessment and Technology Action Plans for Climate Change Mitigation” (MERE, 2012) which covers the energy, transport and industry sectors. This may also be an additional reference point for data availability and monitoring practices in these sectors, and would be investigated under BB3 as well.

Table 16 provides a preliminary bottom-up assessment of the data collection efforts in the key NDC sectors as a result of these policies and programs. **The activities for enhancing data collection, particularly at the facility- or project-level are addressed in the following section on MRV, because MRV systems include the “measurement” of data required to reporting both emissions and emission reductions.**

Table 16. Preliminary bottom-up assessment of data collection in key sectors

NDC Sector	Relevant Key Ministry / Institution	Example data sets	Strengths	Weaknesses
Energy	CEB SEA Ministry of Power and Renewable Energy	Electricity production (kwh) Fuel consumption (litres) Renewable energy generation (kwh)	Engineering-based Technical understanding Mature data collection systems	No mandatory GHG data collection Complexity of information Age of process & systems
Transport	Ministry of Transport & Civil Aviation CEA	Chemical / pollutants in exhaust (mg) Aviation fuel (litres)	Legally driven, so required for environmental compliance Existing enforcement mechanisms	No mandatory GHG data collection Central data repository High volume of data
Industry	Ministry of industry and Commerce NCPC Industrial Technology Institute Industrial Development Board Companies (Various)	Energy, water & waste (kwh, m3, kg) GHG Emissions	Industry / sector related Activity data could be used for GHG estimates CSR reporting driven	No mandatory GHG data collection Varying levels of compliance Data ownership
Waste	Ministry of Provincial Councils and Local Government CEA	Waste to landfill (kg) Recycling (kg)	Local data collection Granular information	No mandatory GHG data collection Local responsibility, so variable quality No central data repository

3.3 Institutional and regulatory framework

This section highlights some of the regulatory and institutional elements of market readiness that would be addressed under BB3, how these could build on existing initiatives, and the gaps in capacity that would need attention during MRP implementation.

3.3.1 Regulatory: legal mandate for reporting GHG emissions

One of the most important issues facing data collection, MRV and development of registry systems is that there is currently no legal requirement for private sector organizations to report their carbon emissions to any centralized body. There are, however, a number of policies and strategies aimed at reducing emissions to air, water and land, which may provide relevant activity data and could be a starting point for a more comprehensive system. Table 17 summarizes these key initiatives and pieces of legislation, along with their relevant emissions associated data and potential links to the development of an MRV system. The legal frameworks in Sri Lanka are focused on minimizing localized environmental impacts such as waste water discharge or air pollution from industrial activities, as well as providing monitoring frameworks for local air quality. Whilst not focused on climate change mitigation or carbon market relevant data *per se*, the regulatory requirements have relevance in the design of the MRV. For example, data from local air quality legal requirements (including the type, make and emissions from vehicles collected at emissions testing centers) could be used to build up a picture of private vehicle emissions in the transport sector. Similarly, approval by the CEA to grant an 'Environmental Protection License' to operate new business / industrial facilities could be expanded to include the ongoing monitoring of those facilities (i.e. outside of waste water discharge).

While enforcement mechanisms do exist to ensure environmental compliance (e.g. through Environment Protection Officers) existing resources are currently unlikely to address, for example, the expansion of vehicle registration or the significant increase in construction activities within certain parts of the country (e.g. Colombo). BB3 should therefore investigate the possible expansion of the environmental compliance data to cover carbon emissions within the design of the MRV, the potential to upgrade existing administrative infrastructure to capture emissions data, current enforcement procedures related to environmental monitoring and possible improvements as well as the efficacy of existing monitoring, verification and enforcement mechanisms.

Table 17. Legislative acts and regulations with possible emissions-related components and potential links to MRV

TYPE	NAME	DESCRIPTION	RELEVANT EMISSIONS COMPONENT	RELEVANT NDC	POTENTIAL LINKS TO MRV SYSTEM
ACT	National Environment Act (1980; updated 1988 & 2000) Designed to promote sound management of the environment whilst balancing needs of economic development				
REGULATION	Environmental Protection License Prescribed Activities (2008)	Requirements for minimum levels of pollution (including waste water discharge) from certain industry activities	Provision of waste water discharge levels including BOD and COD	Waste	Provisions for wastewater measurement and data
REGULATION	Solid Waste Management (2006, 2008, 2009)	National policy / legislation on solid waste management & solid waste disposal	Provision of municipal solid waste management handling	Waste	Carrier licenses and data on municipal waste handling by waste stream
POLICY	National Policy on Urban Air Quality Management (2000) Maintain and enhance air quality so as to reduce related health expenditure				
REGULATION	Air emission, fuel & vehicle importation standards (2003; updated 2015)	Sets vehicle emissions standards for import and use including provision of emissions testing	Emissions data for vehicles (carbon monoxide, hydrocarbon & smoke levels) collected at emissions testing facilities.	Transport	Availability of baseline data. Conversion to CO ₂ e. Vehicle type, age and engine size data.
REGULATION	Prohibition of Ozone depleting substances (2003)	Banning of CFC	Use of replacement refrigeration gases and equipment	Industry	Unknown if CFC and HFC register and / or carrier license registration currently in place
REGULATION	Permissible Ambient Air Quality Standards in relation to class of Air Pollutants (2008)	Provision for minimum air quality standards at the workplace including monitoring	Measurement of pollutants including Nitrogen Dioxide, Sulphur Dioxide, Ozone, Carbon Monoxide and Particulate Matter	Industry	Availability of baseline data. Conversion to CO ₂ e. Monitoring and measurement requirements for heavy industry
POLICY	Cleaner Production Policy (2004) Incorporate cleaner production concepts into all development sectors of the country				
STRATEGY	Strategy on Cleaner Production in Agriculture Sector (2012)	Promotion of sustainable production practices in the agriculture sector	Establish monitoring and evaluation mechanisms to evaluate performance (including energy)	Industry	Energy consumption data

Further, as part of its NDC in the Industry sector, Sri Lanka has committed to implementing the NGRS which was established in 2011. This initiative closely mirrors the International Global Reporting Initiative (GRI G4) focused on corporate sustainability report. The NGRS includes requirements for companies at different levels of maturity (i.e. a “tier system”) to measure and report their environmental performance. Table 18 lists the main emissions related environmental requirements included in the NGRS that could be relevant for monitoring GHG emissions.

Table 18. Main emissions-related environmental requirements included in the NGRS

INDICATOR	INDICATOR DESCRIPTION
ENVT 3	Direct energy consumption by primary energy source
ENVT 4	Indirect energy consumption by primary energy source
ENVT 5	Energy saved due to conservation and efficiency improvements
ENVT 6	Initiatives to provide energy-efficient or renewable energy based products and services, and reductions in energy requirements as a result of these initiatives
ENVT 7	Initiatives to reduce indirect energy consumption and reductions achieved
ENVT 13	Total direct and indirect GHG emissions by weight
ENVT 14	Initiatives to reduce greenhouse gas emissions and reductions achieved
ENVT 15	NOx, SOx and other significant air emissions by type and weight

Currently, the NGRS has been promoted by government and private sector bodies such as the Ceylon Chamber of Commerce. While support has been favorable, implementation of the NGRS reporting requirements has only been undertaken by a handful of companies (i.e. <30), many of whom are already collecting this type of data for CSR reporting.

Given the likely importance of the NGRS to the development of the MRV, a key component of BB3 is therefore to engage with relevant ministries to better understand the timeframe for wider implementation of NGRS under the NDCs, and what, if any assistance is required from the MRP. In parallel, BB4 will also help support the promotion of the NGRS through knowledge exchange and capacity building to the private sector through representative bodies such as the CCC.

3.3.2 Institutional arrangements and capacity needs assessment

Design and implementation of the MRV will have to consider the institutions which are currently responsible for collecting environmental and (non-GHG) emissions related data, and will be tasked with rolling out aspects of MRV data collection. There is a complex interaction between Government Ministries, policies and implementation bodies / Line Agencies with respect to data collection and implementation of actions. For example, actions to implement the SDGs in Sri Lanka cover 51 different ministries and approximately 425 Line Agencies. The previous section noted that currently enforcement

capacity is a critical limiting factor for environmental regulations. This section examines the institutional arrangements, and their linkages, related to MRV for GHG emissions and emission reductions, and highlights other capacity gaps.

National GHG Inventory: The TNC, as with other UNFCCC-related initiatives, is coordinated by CCS. The data collection and analysis will be carried out by government and external experts, including sector specialists, employed by the CCS, in collaboration with all the relevant stakeholders. An inventory task force will be established with technical support from national inventory experts. Working groups for different sectors will comprise from relevant agencies and will be trained to prepare the national inventory with the technical support of international consultants. The inventory is a good example of CCS coordinating inputs from multiple stakeholders inside and outside of government and has worked effectively to date. At the same time, this interaction is not necessarily a two-flow of information, and data sharing on an ongoing basis may be a challenge for consistent reporting. Furthermore, the current institutional set up reflects historical emissions data and their associated activities which may not address the forward looking requirements of a more comprehensive MRV system.

Energy Balance: Preparation of the annual Sri Lanka Energy Balance is the responsibility of Sri Lanka SEA, who collect data from a variety of national agencies and organizations, such as the Ministry of Power and Renewable Energy, Ministry of Petroleum Industries, CEB, Lanka Electricity Company (Pvt) Ltd., Ceylon Petroleum Corporation and the Department of Census and Statistics. As with the GHG inventory, because the data gathering is not an interactive process and ongoing institutional coordination is limited. In addition, there are sometimes overlapping or even competing mandates for different institutions (e.g. SEA & the Ministry of Petroleum Industries), which may require clear data sharing agreements as well as related capacity building.

SLCCS: The human and technical capacity building at SLCF is a prerequisite to the expansion of the SLCCS. While there are skilled personnel, there is only a small unit devoted to validation and verification. Any significant increase in project flow would require more auditors than only SLCF. SLCF currently performs the functions of the administrator for the standard as well, which also make it difficult to scale-up the system without additional dedicated staff. In addition, for a new CPI to complement the SLCCS, additional technical and human capacity would be required, as well as close coordination across the sectors. Furthermore, a commercially-focused marketing function may be required to promote the program and create more demand in addition to the relevant technical and administrative capacity.

CPF: Because of the responsibilities for ongoing data collection and MRV under the CPF programs, the institutional capacity of CEB to carry out this work must be strengthened further. In addition, to avoid double counting of emission reductions between the CPF program and other programs like CDM, or SLCCS, the CPF has identified the need for linkages between projects registered under the different activities – both institutional coordination and linked or common registries.

CDM: While a number of projects have been registered using third-party auditors accredited by the CDM EB, many of these projects were registered years ago and may not have maintained project development skills or links to auditing expertise. Institutional capacity building is likely to be required on not only project development and administration for project-based emission reductions, but also for third-party verification.

Energy NAMA: One of the goals of this project is to identify and overcome barriers in how to integrate, synchronize and aggregate the inventory data at the local authority level to the provincial and national level (i.e. to serve the needs of the TNC). Such coordination would allow the country to generate much more specific inventories at the sub-sectoral and provincial levels.

The next section identifies the needs, steps and elements of MRV systems as part of core market readiness. In addition, it provides a summary (at the end of section 3.4.2) of how current institutional capacity and MRV systems in Sri Lanka impact the potential for developing CPIs and what issues must be addressed by BB3 activities.

3.4 MRV Systems

Building on the underlying data collection systems addressed in section 3.2, quantifying GHG emissions and emission reductions using robust MRV systems is an indispensable pre-requisite to the monetization of GHG emission reduction and the creation of carbon markets. For example, in the context of crediting mechanisms, complete and transparent MRV systems, which include the registration of emission reductions and transactions, are necessary to assure the economic value of credits, to promote the environmental integrity of markets, and to avoid double counting. The implementation of the activities under BB3 therefore supports both the SLCCS and other CPIs that Sri Lanka may choose to implement.

Furthermore, MRV systems will be a significant component in effectively reporting GHG emissions at the national level and in tracking and improving the implementation of national and international mitigation goals and policies (Singh, Finnegan, & Levin, 2016). Sri Lanka, therefore, needs up-to-date MRV of GHG emissions as the basis for reporting of national GHG emissions in the TNC. The MRV of GHG emissions will also allow Sri Lanka to assess emission trends over time and to track progress towards national goals and NDC commitments and report this to the international community. In addition, MRV of mitigation actions will be equally important for understanding whether GHG reduction targets in the NDC or domestic policies, programs and actions have been achieved (see Figure 24). This will in turn be crucial for generating “credits” from programs or projects that may be sold or used to meet mitigation goals.

3.4.1 Objectives of a national MRV framework

A proposed MRV framework for reporting GHG emissions and mitigation activities at project-, program, -sector, and national -level in Sri Lanka should allow Sri Lanka to effectively engage in international markets (e.g. through bilateral offset schemes or international credit mechanisms) by developing a “future-proof” system for MRV that is expected to be in line with reporting requirements under the UNFCCC, and not prohibit linking or access to international markets or finance. To do so, it will need to meet the following objectives:

- (a) Improve monitoring and reporting of activity data and/or emission data for the electricity generation, transport, industry and waste sectors;
- (b) Improve data validation and verification processes;
- (c) Build awareness and confidence in the SLCCS and other new CPI(s), especially with banks and financial institutions;
- (d) Track and document Sri Lanka’s contributions to climate change mitigation;
- (e) Facilitate data sharing within the four sectors and between the sectors where relevant;
- (f) Build institutional capacity within the SLCCS to develop domestic carbon markets, and support the implementation of any future CPIs;

The first four objectives are addressed in this section, while the institutional and capacity issues are discussed further in section 3.3. To meet the above objectives, the MRV framework should integrate the following components:

- **Data gathering for estimating emissions:** procedures and protocols for data collection (incl. activity data) at various levels for estimating absolute emissions from the four sectors (see also section 3.2);
- **Project/program data gathering:** procedures and protocols for data collection for ex-ante estimation of emission baselines, project/program emissions, and emission reductions, as well as related activity and compliance information;
- **Quantification of project/program emissions, baselines and emission reductions:** Methodologies for quantifying emission reductions after the implementation of the projects, by comparing actual project/program emissions to the agreed baselines;
- **Reporting of project/program emissions, baselines and emission reductions:** Procedures for reporting mitigation actions, emissions and emission reductions, data sharing within and between sectors and development of QA/QC procedures to ensure transparency and accuracy of reported data;
- **Verification of reported emissions, baselines and emission reductions:** Procedures and protocols for verifying reported emissions, project baselines and project emissions ex-post the implementation of the project/program.

3.4.2 Existing expertise and capacity

A new MRV framework developed under the PMR program should build on and leverage existing experience and expertise in the country. Section 3.2.1 summarized the various mechanisms and programs implemented in Sri Lanka collect data related to GHG emissions. This section details the MRV components and expertise of each of these mechanisms and programs, which could be leveraged as a basis for a future MRV system. Table 19 provides a top-down summary of these current initiatives.

National GHG inventory: All of Sri Lanka's national communications were both prepared in accordance with the Revised 1996 IPCC Guidelines and across major sectors including those included in the NDC. The completion, analysis and QA/QC of this information will be carried out according to the IPCC Guidelines.

Energy Balance: The Sri Lanka Energy Balance covers monitoring and reporting of primary fuel production, fuel consumption, electricity generation and electricity use. The energy balance does not provide any data on GHG emissions, although it does provide an annually-updated calculation of the national grid emission factor. The energy balance will not provide project- or program-level data, however, but could support sectoral baseline setting and emissions reporting.

SLCCS: Projects must apply an approved CDM methodology or a methodology approved specifically for the SLCCS by the SLCCS EB (although so far, only CDM methodologies have been used). These methodologies specify the MRV requirements. SLCCS projects are validated by SLCF or an accredited third-party validation/verification body to confirm that the desired project meets the eligibility criteria and that all GHG emission reductions or removals are quantified according to the requirements. Once a project starts, the project proponent will monitor and measure GHG emission reductions or removals according to the approved methodology. All information for a given monitoring period is documented in a monitoring report, using the SLCCS template. The monitoring report is then verified by SLCF or another verification body accredited by the SLCCS EB.

CPF: The MRV framework under development for the program would cover the entire power sector, based on the aggregation of facility-level data, and is being developed based on existing framework for developing of “grid emission factors” (mainly CDM). This involves the design of standards and implementation arrangements to meet the international requirements.

The data and methodological requirements are mainly in line with the CDM methodology ACM0002 (“Grid-connected electricity generation from renewable sources”). The QA/QC procedures with data collection, collection frequency and its validity will also be in line with ACM0002. One of the main parameters that is required to calculate emission reductions – electricity generation by plants – will be collected directly at the facility-level from an aggregating entity like CEB or SEA. The program also would require periodic update of the grid emission factor. The current data collection practices will be reviewed thoroughly and measures will be taken to strengthen current practices so as to ensure calculation of emission reductions without any material misstatements. The CPF also aims to identify various modalities and procedures along with requirements for project-specific information to allow projects to access various climate finance sources and participate in other schemes like CDM, JCM.

CDM: Experience of MRV through the CDM has been limited to methodologies related to renewable power and waste-to-energy, specifically CDM methodologies for small scale renewables (AMD-I.K.), methane avoidance (AMD-III.K.) and waste treatment (ACM0022). A review of project documentation related to the CDM projects prepared for Sri Lanka (i.e. PDDs and validation reports) indicates that the PDDs were in the main part prepared by the project proponents, a number of which are international companies. In some cases, local consultants have supported preparation of the PDD. Validation reports were either prepared by international Designated Operational Entities (DOEs) using staff from their Indian office or by Indian or other Asian DOEs.

Energy NAMA: The main objective of the MRV component of the project is to outline a comprehensive GHG monitoring, reporting and verification system by developing monitoring plans, monitoring guidelines/procedures and reporting templates/guidance documents for specific project types in electricity generation and use. In addition, the project aims to build capacity within local institutions and industries on improving GHG accounting practices. The MRV tools developed under this project aims to meet the requirements for “domestic MRV of domestically supported NAMAs”¹¹. The MRV system developed is therefore neither designed as an MRV system for project-based interventions nor as a system to access international carbon markets or meet the requirements of any new market mechanisms under the Paris Agreement. The tools developed so far include a framework design document (FDD), which outlines the monitoring methodologies, parameters for calculation of baseline/project emissions and the basis of monitoring protocols for a set of specific project types. The FDD also presents a recommended reporting process, including GHG emissions parameters and their measurement, frequency, data sources and monitoring criteria. The FDD is accompanied by three sets of monitoring protocols, procedures for data monitoring, and monitoring templates and logbooks: one set each for solar PV, biogas digesters and for high efficiency motors. While these pilots for the FDD cover only a few technologies, the range of MRV tools could be expanded to cover other interventions in the energy sector.

¹¹ As laid down in UNFCCC Decision 21/CP.19 on “General guidelines for domestic MRV of domestically supported nationally appropriate mitigation actions by developing country Parties”

Transport NAMA: The “NAMA Design Document for the Transport Sector of Sri Lanka” presents a NAMA MRV Framework, which includes the tailor-made procedures and equations for calculating baseline emissions, project emissions and emission reductions. The procedures for calculating baseline emissions, project emissions and emission reductions and the associated parameters are based on CDM methodology, and specifically AMS-III.C: Emission reductions by electric and hybrid vehicles”.

Table 19. Summary of current systems for MRV of GHG emissions and/or emission reductions

Program	Sector(s)	Methodology	Actors	Description
MRV FOR GHG EMISSIONS				
National GHG inventory	Energy, industrial processes, agriculture, land use change and forestry, waste	1996 IPCC Guidelines	Relevant government departments, coordinated by the MMDE	Information on emissions and removals of GHGs is mandated under the UNFCCC for all Parties to the Convention. These reports are referred to as “top-down” national inventories, as emissions are often calculated using national-level data, although disaggregated data (e.g. facility-level) may also be incorporated. The IPCC sets out a protocol for collecting data and reporting GHG emissions.
MRV FOR MITIGATION ACTIONS				
Energy Balance	Energy	Data collated from submissions from various relevant actors	Relevant departments (e.g. Ministry of Power and Renewable Energy, CEB, Central Bank of Sri Lanka, Department of Census and Statistics), coordinated by SEA	This online database, which is updated annually, provides information on key types of energy resources (e.g., biomass, hydropower, petroleum); energy supply (biomass, petroleum, coal and electricity); transmission/distribution; and demand (e.g., households, transport, commercial buildings).
SLCCS	All possible, but so far only renewable power	CDM methodologies or other SLCCS-approved methodologies	SLCCS Executive Board, appointed by SLCF. Validation and verification by SLCF so far, but additional entities may be accredited	Credits issued based on the final decision of SLCCS EB. Project information will be listed on SLCCS website when credits (SCERs) are available for exchange.
CPF	Energy (power sector)	Based on CDM, and specifically methodology ACM0002 (Grid-connected electricity generation from renewable sources)	Ceylon Electricity Board as the coordinating entity, supported by the World Bank	The MRV framework covers the entire power sector and is developed based on an existing framework used for the development of a grid emission factor. Certain flexibility is introduced in the system to accommodate difficulties with data gathering. The requirements will be made more stringent over time, while drawing lessons from learning-by-doing.

CDM	Mainly energy, some waste	CDM methodologies, mainly for small scale renewables (AMD-I.K.), methane avoidance (AMD-III.K.) and waste treatment (ACM0022)	Participating CDM installation, UNFCCC, third-party auditor	Credits are issued by the UNFCCC directly to project owners. The government is not involved in any transaction of credits, although it has introduced an institutional framework for CDM and host country approval of projects (see BB2).
NAMA in the energy generation and end use sectors in Sri Lanka	Energy	Activity-specific methodology, based broadly on CDM and IPCC	UNDP, SEA, CCS, CEB, municipalities and industry organizations	The project incorporates both an MRV component for the activities covered by the domestically-supported NAMA and development of a provincial-level GHG inventory tool that could eventually serve the energy generation and end-use sectors.
Transport NAMA	Transport	CDM methodology, specifically AMS-III.C	Relevant ministries and government departments (e.g. Ministry of Internal Transport, Ministry of Highways, Ports and Shipping, Urban Development Authority	The overarching target of the Sri Lanka NAMA in the transport sector is the promotion and adoption of clean, sustainable and efficient means of public transportation within the Colombo Metropolitan Area, resulting in a modal shift from private to public mode of transportation. Include the development of a framework for MRV for the shift to public transport.

This review of current MRV systems and the review of institutional and regulatory issues in section 3.3 highlights the following:

Sri Lanka has developed the expertise with reporting of GHG emissions for the national communications: Sri Lanka is currently in the process of preparing its TNC, which will be led by the CCS. The CCS already led preparation of the SNC and therefore has good relevant experience of the national communication process, and of the gaps identified in the INC and SNC, although increasing the depth and accuracy of the GHG inventory may require additional resources.

The majority of the MRV expertise and capacity in Sri Lanka is related to the energy sector: Historic experience with the CDM and the SLCCS, as well as the on-going projects supported by the CPF and UNDP, have focused on developing projects in the energy sector. These have mainly focused on hydropower and biomass use, plus more limited activities in MRV for solar, wind and end use energy efficiency.

The MRV experience and methodologies used are primarily based on the CDM: Experience in Sri Lanka has been gained in the use of CDM methodologies and associated MRV procedures through the development of the 22 CDM projects that have been registered in the country, as well as the three SLCCS projects. In addition, many of the on-going programs and projects involving MRV of emissions and emission reductions are based on the use of CDM methodologies. This is particularly true of the SLCCS, CPF and Transport NAMA, and to a lesser but still significant extent for the Energy NAMA.

Significant MRV development programs are still in the preparatory stages: Apart from projects under the CDM and SLCCS, which have been implemented and where first-hand experience of MRV has been gained, the majority of relevant programs described in the previous section, such as the CPF and the two NAMA programs, are still in the design or pilot stages, and have not yet had a significant impact on capacity building of local experts.

Despite some experience with project-based emission reduction activities, in-country expertise of MRV remains low: A very limited number of project proponents or consultants in Sri Lanka have experience with preparation of monitoring plans and MRV of emissions reductions. With respect to validation and verification of projects by accredited third parties, this has mainly been undertaken by verifiers based outside the country.

MRV experience and expertise outside the energy sector is very low: MRV experience in the transport sector is limited to the NAMA project in this sector, as only the framework for MRV of certain interventions in this sector has been developed. MRV experience in the waste sector is limited to a small number of CDM projects, whilst negligible experience exists of MRV in the industry sector.

Experience of MRV is highest for project-based activities: Most in-country capacity on MRV is related to the development of project-based financing through experience with the CDM and the SLCCS. Limited experience in program- or sector-based MRV has been gained through the two CDM PoAs, and more expertise and capacity may be developed through the two NAMA projects. Know-how and capacity building with respect to international market mechanisms is being addressed for only one sector through the CPF, but this is also still under development.

3.4.3 Moving toward an integrated MRV system for Sri Lanka

Under the PMR support, Sri Lanka needs to design, pilot and implement an integrated MRV system which allows monitoring and reporting of mitigation actions and emission reductions at

project/program, sector and national level (see Figure 24). The integrated MRV framework should also allow for the monitoring and reporting of sectoral emissions in the four main sectors, and, through collation of sectoral emission data, will also allow reporting of national level emissions of GHGs. The key components of the proposed MRV system should make maximum use of historic experience, on-going activities and existing institutions in Sri Lanka to allow for cost-effective implementation, avoidance of duplication and to overcome known and potential barriers. Given the short timeframe for MRP implementation, and need to complete the analysis of other CPIs in BB2 during the first year, the initial focus of the MRP activities would be on facility- and project-level data collection, to support the enhanced SLCCS and to create a more detailed and reliable database for the National GHG Inventory (i.e. activities shown in dark blue in Figure 24). The longer-term vision for the integrated MRV framework would include more development of sectoral emissions and emission reductions reporting, based on the choice of CPIs and the sectors in which those CPIs may operate.

By tracking and reporting emissions and emission reductions at various levels, the MRV framework will allow the government of Sri Lanka to assess the success or otherwise of sectoral measures and policies for the reduction of emissions of GHGs. This will in turn inform decisions on the need to further support, amend or possibly cease on-going measures and policies, and to determine if new measures and policies need to be developed. The monitoring and reporting of mitigation actions and emission reductions will also allow, in the longer term, Sri Lanka to track and document each sectors' progress with respect to the targets set in the country's NDC, and therefore highlight the country's contributions to climate change mitigation. Tracking Sri Lanka's progress with respect to its NDC targets will also build the country's capacity to attract climate finance.

The vision for an integrated MRV framework for Sri Lanka will include procedures and protocols at all levels for monitoring and determining emissions, emission baselines, and emissions reductions, and the reporting of these in a standard format for verification by third parties. The starting point will be the project- and facility-level data and protocols that we will need regardless of the final choices of an optimal policy package.

At the project- and facility-level, the CCS, with the PMR support, will need to specify the monitoring and reporting requirements that implementing agencies and project developers will have to introduce. The CCS will also specify methodologies and formats for reporting. Given Sri Lanka's experience with the CDM, the procedures and protocols for project/program- level monitoring and reporting may draw on CDM methodologies and procedures. It is important, however, that Sri Lanka gains capacity to effectively follow international discussions and negotiations on the implementation of the Paris Agreement, and in particular with respect to article 6. This would ensure the development of "future-proof" procedures and protocols for a CPI in Sri Lanka which reflects current and potential thinking and developments on, for example, bilateral/regional transfer of mitigation outcomes. The PMR can assist in specifying the monitoring and reporting requirements that relevant government departments, administrative bodies and institutions are required to implement. These bodies will need to interact with the MRV framework by collection and sharing of activity data for sector emission calculation.

For sectoral-level monitoring, Sri Lanka does not currently have methodologies or protocols in place, so these would need to be developed as part of the BB3 workplan. The MRV framework of sectoral emissions will establish procedures for monitoring and reporting of sector level activity data (e.g. MWh

produced, transport statistics), as well as the relevant emission factors to convert activity data into GHG emissions.

Data and results from project/program- level monitoring will need to be collated, reviewed and shared to report GHG emissions and mitigation actions at the national level. Procedures will therefore need to be developed to ensure this data is collated as transparently and as accurately as possible. PMR support will be used to determine to what extent data collected through project/program-level and other more aggregated programs (e.g. CPF program) can interact with and support data collection for the purposes of the national inventory. MRV system development will also focus on implementing effective procedures for data sharing to avoid any duplication of effort whilst increasing the robustness of the national inventory (see also section 3.3.2).

Private project developers, facility owners, some government departments, and other public institutions will act as the main implementing agencies for mitigation activities, as identified in the “Readiness plan for implementation of INDCs” and summarized in Table 18. It should be noted that, while this table is relatively comprehensive, the relevance and role of each of these agencies with respect to the MRV framework will be determined as part of the BB3 workplan. The relevant implementing agencies will need to interact with the MRV framework and in three main ways:

- Collection and sharing activity data (e.g. energy consumption, transport statistics) for project emissions, baseline calculations, and emission reductions;
- Monitoring and reporting of mitigation projects implemented by the respective implementing agency;
- Supporting data sharing, management, and storage using existing and/or new IT infrastructure.

Table 20. Responsible agencies for implementation of NDC mitigation actions

Sector	Main responsible agencies
1. Energy sector NDCs	<ul style="list-style-type: none"> • SEA • CEB • Local Authorities • Ministry of Power & Renewable Energy • Department of Irrigation • Ministry of Finance • Urban Development Authority • Ministry of Policy Planning and Economic Development • Petroleum Resources Development Secretariat • Ministry of Plantation Industry
2. Transport sector NDCs	<ul style="list-style-type: none"> • Ministry of Transport & Civil Aviation • Ministry of Mahaweli Development & Environment • National Transport Commission • Ministry of Higher Education and Highways • Road Development Authority • Central Environment Authority • Ministry of Megapolis and Western Development • Local Authorities • Department of Motor Traffic • SEA • Civil Aviation Authority

	<ul style="list-style-type: none"> • Sri Lanka Port Authority
3. Industry sector NDCs	<ul style="list-style-type: none"> • Ministry of Industry and Commerce • National Cleaner Production Centre • Board of Investment Sri Lanka • Industrial Development Board • Central Environment Authority • Federation of Chambers of Commerce and Industry • Industrial Technology Institute • Sri Lanka Institute of Textile and Apparel • Export Development Board • Ceylon Chamber of Commerce • National Chamber of Commerce • Ministry of Mahaweli Development & Environment
4. Waste sector NDCs	<ul style="list-style-type: none"> • Ministry of Provincial Council and Local Government • Department of Local Government • Ministry of Mahaweli Development & Environment • Ministry of Agriculture • Sri Lanka Land Reclamation and Development Corporation • Ministry of Health, Nutrition and Indigenous Medicine • Central Environment Authority • Urban Development Authority • Industrial Technology Institute

In addition to tracking Sri Lanka's contributions to climate change mitigation, the MRV Framework should allow the tracking of support (financial, technical, capacity building) received for these mitigation activities. PMR support in this respect would focus on identifying the relevant information that needs to be tracked to build an MRV system for climate finance, how to integrate these elements into the general MRV framework (if appropriate), identifying responsible parties and lines of communications, and determining reporting approaches for tracking of climate finance. The support would also build capacity on how to integrate existing and new UNFCCC reporting (e.g. national communications and biennial update reports) and MDB/IFI-led initiatives (e.g. the Common Principles for Climate Mitigation Finance Tracking), which may influence how the international community tracks climate finance.

As highlighted in section 3.4.2, validation and verification (in particular for CDM projects) has mainly been undertaken by accredited third party verifiers based outside the country. There is therefore a strong need for the PMR project to build capacity on verification issues in Sri Lanka. For verification, key responsibilities within the overall MRV framework would be as follows:

- Relevant government departments, administrative bodies and institutions will have the responsibility for ensuring the facility- and project-level activity data they collect from sources such as the private sector and through their own activities is accurate, and will perform appropriate QA/QC of the data prior to submission to the CCS;
- CCS will analyze this data to calculate GHG emissions for the GHG inventory and NDC reporting, and will perform appropriate QA/QC of the emissions and emission reduction data. This will be verified periodically by independent third-party verifiers.
- To meet the above, CCS will need to specify the verification requirements for project developers and implementing agencies, where this is not already proscribed by another standard (e.g. CDM methodologies or IPCC GHG Inventory Guidelines)

3.5 National registry/tracking tools

Sri Lanka is requesting PMR support to increase the scalability and robustness of the SLCCS to enhance the scheme's role in achieving Sri Lanka's domestic energy and emission reduction targets cost-effectively (see BB4). As outlined in BB4, PMR support is requested to identify and assess the sources of demand and how to increase access to those sources, with both national and international sources of demand being reviewed. The proposed registry system for Sri Lanka should therefore reflect the needs of both national and international market mechanisms. The registry will also need to serve other new CPIs that will be explored under BB4, however, so needs to be robust and flexible enough to accommodate new instruments. In the short term, the focus should be on supporting existing CPIs (e.g. SLCCS) and the national GHG inventory.

3.5.1 Objectives and needs assessment for a national registry/tracking tool

3.5.1.1 Objectives and scope

The registry system serves two purposes. The first is data management: developing systems and processes to collect, organize and report data on both emissions and mitigation actions. The second function is the transaction registry, which would include facilitating voluntary cancellation of offsets and eventually linking with any new domestic CPI or international demand. The objective of BB3 will therefore be to build on existing registry systems to develop a national online registry system that serves the dual purpose of data management and transaction registry, starting with project- and facility-level data collection and management. This would initially mainly serve the SLCCS and GHG inventory, but would be expanded to serve additional CPIs as they are agreed and developed.

The registry system in Sri Lanka would include the following key components:

- (a) Systems and processes to collect, organize, report and analyze the necessary data to support existing CPIs (i.e. the SLCCS);
- (b) A hosting infrastructure that would track the generation and transaction of carbon units;
- (c) Adequate flexibility and provisions to support future (international) CPIs or maybe international trading in emission reductions;
- (d) Serve not only as a registry for emissions and emission reductions, but also for tracking mitigation actions and climate finance.

The needs assessment phase will consider a number of fundamental issues to determine what type of system is most suited to Sri Lanka,:

- **The purpose of the CPIs:** Sri Lanka is primarily seeking support to enhance the SLCCS, but will also be exploring another new CPI under BB4. The registry components for SLCCS, which simply registers offsets and records their purchases and retirements, would not be expected to be elaborate or require a sophisticated system. To add additional CPIs, however, more components, and more elaborate systems, may be necessary to create a supportive framework. While the initial work under BB3 will focus on registry requirements for the SLCCS and GHG Inventory, later work under BB3 would also consider the registry requirements for a new CPI, as well as whatever additional components might be required for international trading in emission reductions
- **The scope and scale of the CPIs:** CPIs in Sri Lanka are expected to focus primarily on four main sectors (energy, transport, industry and waste), although the majority of carbon units are

expected to originate from the energy sector, where the potential is greatest and where the NDC commitments are the most ambitious. Given the relatively low number of sectors and activities, a high level of sophistication and automation of the system for Sri Lanka may not be needed at an early stage. However, if a new CPI is introduced and/or the SLCCS grows significantly, more automation may be needed to track units and transactions.

- **The potential for international or domestic growth:** In the longer term, Sri Lanka intends to scale up its mitigation activities by eventually participating in international trading in emission reductions, which could potentially include linking with CPIs in other countries/regions. This decision will influence whether the registry will have to operate under a legal framework that is compatible with that of other countries/regions. This is particularly relevant in the fragmented and “bottom-up” approach as suggested by the Paris Agreement, and it is therefore important to ensure that legal rights under Sri Lankan CPIs are treated similarly to those of potentially linked registers/transaction registries to ensure the former is “future-proof”. Because Sri Lanka intends to use carbon pricing to attract international financing over the longer term, this issue will also be considered during the early stages of the design of the system.

3.5.1.2 Existing expertise and capacity

Certain forms of registries exist or are currently under development within the current systems and capacity for monitoring and reporting activity data (e.g. energy use) or emissions:

National GHG Inventory: Currently the GHG Inventory is compiled from a variety of calculation tools and datasets, and does not have a single, consolidated database.

Energy Balance: the Sri Lanka Energy Balance is structured as an on-line inventory of the parameters discussed earlier, which allow for public access to historical summary data but not online entry of data. The potential to link the GHG registry to the Sri Lanka Energy Balance should be investigated as it would facilitate collection and reporting of sectoral data on emissions from energy production and use, including use of petroleum products in the transport sector.

SLCCS: The SLCCS aims to provide a secure registry system for all SLCERs to offer assurance against double counting and provide transparency to the public. Because there have only been a few projects registered, however, the project and unit registry system is not yet online and data is collected manually by SLCCS. In addition, the current spreadsheet-based system is not linked to any other GHG reporting systems. Part of enhancing the SLCCS would be to develop a full project and unit registry (see BB4).

CPF: The CPF plans to strengthen the Excel based registry developed by the SLCF for the SLCCS, and to provide support to develop this into a registry capturing sectoral emissions and emissions and reductions.

Energy NAMA: For development of the provincial level inventory tool for energy generation and end-use sectors, the UNDP/SEA project will review the EnerGIS database system and existing UNFCCC National Communication Guidelines to identify barriers, needs, gaps, opportunities and challenges in the INC and SNC, and incorporate the lessons learned into the provincial inventory system and TNC. In fact, the final step of the NAMA project will involve testing, verifying and deploying web-based data collection for EnerGIS GHG inventory system for the energy generation sub-sectors (thermal, hydro and NCRE) and end use sectors (energy industry, transport, industry, residential and commercial) in three provinces (i.e. Uva, Central and Southern Provinces). The NAMA project will also identify and overcome

barriers in how to integrate, synchronize and aggregate the inventory data at the local authority level to the provincial and national level and their linkages with the TNC.

SEA EnergyGIS database: The EnerGIS, developed for the energy sector only, is a bottom-up registry designed to collect disaggregated energy data at a sub-sectorial and sub-national level. This will allow for a more robust provincial inventory system that can be updated periodically and aggregated at the national level. This will therefore enhance and complement the National GHG Inventories and could facilitate, for example, the preparation of the UNFCCC Biennial Update Reports (BURs)

3.5.2 Creating an enabling environment for a national registry

3.5.2.1 Enhancing legal capacities

This component would support development of a legal framework that would support the *functions* and *transactions* of the registry. Key functions that the legal framework will likely need to support include, among others:

- To serve as a reporting database
- To be able to record the creation (registration) or issuance (serialization) of carbon unit, initially units from the SLCCS system
- To facilitate the unit's surrender, cancellation, and retirement
- To facilitate and track transfers of the underlying unit

Furthermore, to operate and maintain the registry, an administrator will need to be empowered with the discretion, for example, to refuse or block an account or to suspend the operations of the register/transaction registry as necessary. The successful operation of the register/transaction registry requires sound governance structures, with appropriate segregation of IT and business duties in the internal organization of the administrator, as well as adequate resources. (World Bank, 2016).

Finally, it will be necessary to identify other areas of legislation likely to be affected by the intended CPI and identify the necessary responsible entity to address those laws (e.g. MMDE, Ministry of Finance, Ministry of Trade, etc.) (see also section 3.3.1).

3.5.2.2 Enhancing institutional capacities

Creating a registry for a CPI involves the designation of a public authority, commonly within an environment or energy ministry, with responsibility for the registry's actual implementation. A registry can be administered internally, by a public authority, or outsourced to a third party. BB3 would include conducting a cost-benefit analysis before contracting a third-party service, and duly consider the specific expertise and level of service required, as well as the risks and costs associated with outsourcing.

3.5.2.3 Enhancing operational capacities

Registry administration comprises both management and operational processes. *Management* processes include staff and system management; risk, budget, and resource management; and cooperation with regulatory authorities. *Operational* processes represent the bulk of the administrative tasks, and include monitoring the relationship with users (e.g., entering and terminating a relationship with registry users), and managing registry operations (e.g. issuance of carbon units). The proposed work under BB3 would consider how best to develop and institutionalize these capacities.

Registry administrators are subject to a number of risks, which are proportional to the size and financial value of the market. The most significant risks include: not terminating accounts for facilities that have

been closed, or maintaining a user's authorization while the account should have been blocked or the user's authorizations revoked; failure to report suspicious activities/incidents to the relevant authorities. Raising the awareness of the registry administrator's staff and training staff on control procedures and compliance (e.g. requirements related to updating documents, monitoring transactions, and reporting suspicious activity) are among the practices that can mitigate these risks.

3.5.2.4 *Enhancing technical capacities*

In terms of the actual information technology (IT) software and hardware needed for the registry, Sri Lanka should 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 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, depending on the type of CPI, 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. In the case of linking distinct registries between jurisdictions, two interfacing options are available: the use of a central communication hub (e.g. the International Transaction Log under the Kyoto Protocol) or the development of peer-to-peer network connections; both options have pros and cons.

A registry will be exposed to various security risks, which can be mitigated by adopting the following technical security measures:

- Enhancing the strength of authentication and time-out requirements can reduce the risk of identity usurpation.
- Limiting administrator access to normal working hours, automatic system checks during data entry, and multiple validation requirements can reduce the risk of fraudulent or accidental transfer.
- Limiting administrator access to the registry by client IP address (i.e., administrator users may only log on to the registry from networks known to be controlled by the responsible organization).
- Restricting both physical and electronic access to registry hosting infrastructure/servers.
- Ensuring strong encryption of data transfer and data storage.
- Conducting regular penetration testing and operating system and software patching.
- Adding detection and alert functions—which can be customized for individual account holders—to detect suspicious administrative events, such as an unusually high number of transactions.

3.5.2.5 *Enhancing financial capacities*

Developing and operating a registry system will likely have high up-front costs to develop the infrastructure, identify the data requirements of separate policies, and engage with a greater number of users. The following general elements would be considered in terms of the financing needs for developing and operating the registry system:

- **Weighing the pros and cons of different financing approaches:** For example, where administration costs are not covered with public funding, one option is to charge a fee for a range of registry operations and services. Alternatively, options could be considered to cut administrative costs, such as: formalizing operational procedures; setting control and monitoring standards for participants in accordance with their size and level of market involvement; and automating informational exchanges with registry users.
- **Planning and budgeting for continuous improvement:** Through feedback from experts and stakeholders, Sri Lanka could plan to dedicate budget for the continuous improvement of data functionality

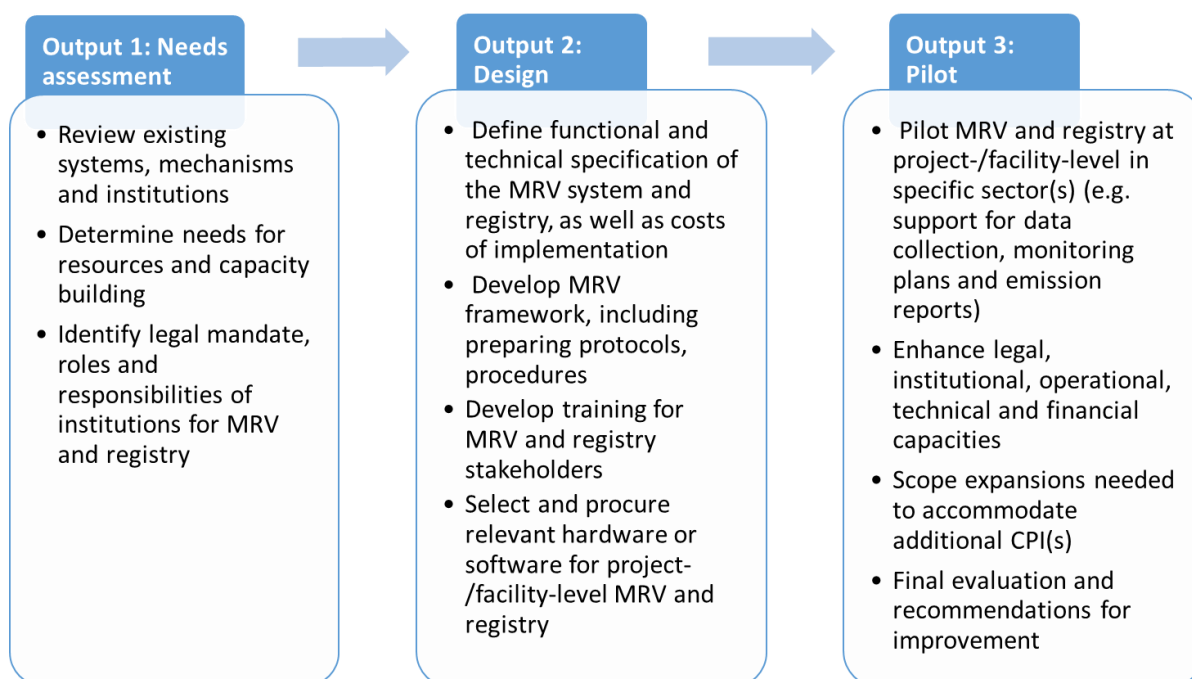
3.6 *Activities, deliverables and proposed budget*

The activities and deliverables to be undertaken as part of the BB3 are divided into three phases, as outlined in Figure 26 and summarized below:

- **Output 3.1 - Needs assessment:** as part of this first phase, the PMR support for development of the MRV system and registry will focus on a review of the existing systems, mechanisms and institutions in Sri Lanka to determine the needs for resources and capacity building, to fully assess the basis for new MRV and registry systems and to design the new systems based on this assessment. This phase would also provide inputs to the choice of how and where to pilot new data collection, MRV and registry tools;
- **Output 3.2 - Design:** the second phase would focus on defining the functional and technical specification of the MRV system and registry, and would include, for example, developing the MRV framework, including preparing protocols, procedures and methodologies for the MRV system in Sri Lanka and reviewing the structure of the proposed registry and defining institutional requirements. The initial focus, as explained above, would be facility-level data collection and project-level MRV tools to assessing emission and emission reductions, to support the SLCCS and the GHG Inventory. Any hardware or software related to operation of the MRV system or the registry would be procured during this phase;
- **Output 3.3 - Piloting new systems:** this last phase would involve rolling-out the new mechanisms and procedures and piloting the main components of the scheme for a specific sector or technology area. This could, for example, cover piloting the MRV system at the project level and providing support for data collection, monitoring plans and emission reports. The sector or technology area would be chosen so that the pilot complemented other ongoing initiatives and strengthened the national MRV and registry system. Also during this phase, the outputs from BB2 and Part II of BB4 would be reviewed, so that some scoping work could be

conducted on the additional MRV and registry needs to accommodate the new CPI(s). A final evaluation and recommendations for improvement will also be made during this phase.

Figure 26. Staged implementation approach for BB3 activities



Plans for engagement and consultations with relevant stakeholders impacted by the introduction of the MRV system (e.g. private operators - particularly in the sectors where new systems are piloted - auditors, NGOs and policymakers) will be developed, and in particular during the needs assessment and design phases. Engagement and consultations activities recommended by these plans will be discussed more in detail under BB5. This will help to secure buy-in, resolve conflicts, promote transparency, and improve reporting entities' preparedness and compliance rates. Consultations can also help establish a common understanding of program objectives and rationale, inform the technical details and rules of the program, and provide training so that entities can report the relevant information accurately.

3.6.1 Objectives

The objectives of BB3 are to enhance Sri Lanka's core market readiness components by:

- Designing and piloting a national MRV systems, with an initial focus on project-/facility-level emissions and emission reductions
- Designing and piloting a national registry system, covering both data management and transaction registry functions

3.6.2 Outputs, activities and deliverables

Output	Rationale	Activities/Description	Deliverables	Responsibility
Output 3.1. Needs assessment	<p>Review of the existing systems, mechanisms and institutions in Sri Lanka to determine the needs for resources and capacity building, to fully assess the basis for new MRV and registry systems</p> <p>Identify the legal mandate, roles and responsibilities of institutions to perform their function with respect to MRV and the registry to avoid duplication of activities</p>	<p>3.1.1 Review the existing legal mandates and relevant environmental legislation relevant to MRV, as well as enforcement procedures, and recommend appropriate amendments to support the proposed MRV framework</p> <p>3.1.3 Review roles and responsibilities of relevant institutions and propose formal process for sharing of information and data</p> <p>3.1.4 Review existing human resources and undertake sector-wise gap analysis of needs (awareness raising and training) for operation of the MRV framework and registry (project developers, administrators and implementing agencies)</p> <p>3.1.5 Review the need for building on/linking with other national registries</p>	<p>Report summarizing all activities for this output and recommending:</p> <p>(a) Relevant amendments and additions to legislation to formalize the proposed MRV framework and registry system</p> <p>(b) Formalized roles and responsibilities of relevant institutions</p> <p>(c) Plan for capacity building plan to relevant MRV and registry stakeholders to inform activities under BB5</p> <p>(d) Defined information and data sharing procedures between institutions identified in (b)</p> <p>(e) Basic structure and needs for MRV and registry system</p>	CCS
Output 3.2. MRV and registry design	<p>Define the functional and technical specification of the MRV system and registry, including costs of implementation</p> <p>Develop MRV framework, including preparing protocols and procedures</p> <p>Determine the best option for development</p>	<p>3.2.1 Develop MRV framework including protocols and procedures for MRV, including procedures for collecting and collating reports and aggregating the emission reductions achieved, starting with project- and facility-level data collection and MRV to meet needs of the SLCCS and GHG Inventory (to include stakeholder consultations)</p> <p>3.3.2 Determine costs of implementing and operating the MRV framework, including costs associated with staff, outreach, training, developing and maintaining emissions data management system, and facilitating compliance and enforcement. Investigate and recommend financing approaches for elements of the MRV framework.</p>	<p>Report on MRV framework including:</p> <p>(a) protocols and procedures for facility- and project-level data collection and MR</p> <p>(b) Procedure for communicating results of MRV to decision making bodies and integrating into national priorities and policies and verifiers (MRV for sectoral emissions)</p> <p>(c) Procedures for collecting and collating reports and aggregating the emission reductions with QA/QC procedures, and protocols for communication of</p>	CCS

Output	Rationale	Activities/Description	Deliverables	Responsi-bility
	or procurement of a registry	<p>3.2.3 Deliver sector-wise training on MRV framework to relevant stakeholders as identified in Phase 1</p> <p>3.2.4 Define protocols for communication of collated data for national GHG inventory</p> <p>3.2.5 Design of registry system, including functional specifications, options for procurement of a registry (i.e. sharing, developing, adapting or outsourcing), and interface needed with other IT systems and databases (to include stakeholder consultations)</p> <p>3.2.6 Determine costs of operation of the registry system, the budget needed for continuous improvement, and the financing options for the registry system.</p> <p>3.2.7 Develop plans for training and capacity building to registry administrator and other registry users, which will be implemented under BB5</p> <p>3.2.8 Identify the sector(s) and technology areas(s) for the Pilot</p>	<p>collated data for national communications</p> <p>(d) Estimate of costs of the MRV framework, both upfront and ongoing</p> <p>Report on review of options for procurement of a registry and recommendations on optimum option</p> <p>Recommendations for relevant training to regulators, project developers/implementing agencies and verifiers on MRV and registry, to be implemented under BB5</p>	
Output 3.3. Pilot the system	<p>Pilot MRV system at project-/facility-level in specific sector before national rollout, to refine design</p> <p>Enhance legal, institutional, operational, technical and financial capacities for MRV and registry</p> <p>Conduct final evaluation and recommendations for improvement</p>	<p>3.3.2 Develop and pilot relevant templates, guidelines and tools to support MRV in the selected sector(s), including verification requirements and guidelines</p> <p>3.3.4 Create an open access, web-based project and unit registry to build awareness and allow SLCCS to communicate to potential stakeholders and interested parties</p> <p>3.3.4 Recommend additional training MRV framework and registry to participants in pilot activities, which will be implemented under BB5</p> <p>3.3.5 Procure software and hardware for registry</p>	<p>Set of templates, guidelines and tools for MRV for specific project types in selected pilot sector(s)</p> <p>An open access, web-based project registry to be managed and updated for SLCCS, with relevant training on operation and update of the website provided to SLCCS</p> <p>Plans for additional training workshops on MRV and registry issues for pilot participants to be implemented under BB5</p> <p>Financial resources secured for development, implementation and</p>	CCS

Output	Rationale	Activities/Description	Deliverables	Responsi-bility
			operation of the MRV framework during period of PMR support	

3.6.3 Timeline

Output	2018			2019			2020		
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Output 3.1 Needs Assessment									
Output 3.2 MRV and registry design									
Output 3.3 Pilot the system									

3.6.4 Budget

	Estimated support from PMR (US\$)			Funding Source (US\$)		
Output	Year 1 (2018)	Year 2 (2019)	Year 3 (2020)	PMR	Government	Total
Output 3.1 Needs assessment	170,000	0	0	170,000	17,000	187,000
3.1.1 Review enforcement procedures and possible improvements	25,000	0	0	25,000	25,000	27,500
3.1.2 Review roles and responsibilities of relevant institutions (e.g. SLCCS, SLCF, implementing agencies) and propose formal process for sharing of information and data based on international best practice	15,000	0	0	15,000	15,000	16,500
3.1.3 Review roles and responsibilities of relevant institutions (e.g. SLCCS, SLCF, implementing agencies) and propose formal process for sharing of information and data based on international best practice	30,000	0	0	30,000	3,000	33,000

Output	Estimated support from PMR (US\$)			Funding Source (US\$)		
	Year 1 (2018)	Year 2 (2019)	Year 3 (2020)	PMR	Government	Total
3.1.4 Review existing human resources and undertake gap analysis of needs for operation of the MRV framework	50,000	0	0	50,000	5,000	55,000
3.1.5 Review the need for building on/linking with other national registries	50,000	0	0	50,000	5,000	55,000
Output 3.2 MRV and registry design	165,000	255,000	0	420,000	42,000	462,000
3.2.1 Develop MRV framework	60,000	0	0	60,000	6,000	66,000
3.2.2 Determine costs and financing options of implementing and operating the MRV framework	30,000	0	0	30,000	3,000	33,000
3.2.3 Deliver sector-wise training for MRV framework	45,000	55,000	0	100,000	10,000	110,000
3.2.4 Define protocols for communication of collated data for national GHG inventory	0	45,000	0	45,000	4,500	49,500
3.2.5 Design and specification of the registry, functions, and plan for stakeholder consultation	30,000	50,000	0	80,000	8,000	88,000
3.2.6 Determine costs of registry and financing options	0	20,000	0	20,000	2,000	22,000
3.2.7 Deliver training to registry admin and users	0	60,000	0	60,000	6,000	66,000
3.2.8 Identify sector and technologies for pilot	0	25,000	0	25,000	2,500	27,500
Output 3.3 Pilot the system	0	112,500	272,500	385,000	38,500	423,500
3.3.1 Develop and pilot methodologies	0	42,500	42,500	85,000	8,500	93,500
3.3.2 Develop and pilot relevant templates, guidelines and tools	0	47,500	47,500	95,000	9,500	104,500

Output	Estimated support from PMR (US\$)			Funding Source (US\$)		
	Year 1 (2018)	Year 2 (2019)	Year 3 (2020)	PMR	Government	Total
3.3.3 Create open access, web-based project and unit registry	0	0	65,000	65,000	6,500	71,500
3.3.4 Provide additional training on MRV framework and registry as part of pilot	0	0	50,000	50,000	5,000	55,000
3.3.5 Procure software and hardware for registry	0	22,500	67,500	90,000	9,000	99,000
Total	335,000	367,500	272,500	975,000	97,500	1,072,500

4. Building Block 4 – Framework for enhancing and scaling up the SLCCS

Building on the policy analysis and mitigation assessments conducted in BB2, BB4 aims to outline the framework to enhance and scale up SLCCS. In particular, BB4 includes the required support for (a) enhancing the liquidity of SLCCS by identifying options for increasing demand and supply; and (b) creating an enabling environment for SLCCS by enhancing the scheme's institutional, technical and operational structures. In addition, BB4 considers the development of a new CPI, based on the analysis performed under BB2, that could not only assist Sri Lanka in meeting its NDC goals but also provide an additional source of demand for the credits from the SLCCS.

Part I. Modules for the crediting instrument – Enhancing the Sri Lanka Carbon Crediting Scheme

Crediting instruments, which provide credits for project, program or sector-based activities for emission reductions, have been attractive to policymakers for several reasons. They offer flexibility to meet domestic or international emission reduction commitments by being a source of cost-effective emission reductions, as one example. They can also commoditize emission reductions independently from market demand through RBCF, where credits issued are the proof of mitigation results (World Bank, 2015 a). In this context, Sri Lanka's nascent domestic crediting scheme, SLCCS, has a large potential to scale up and incentivize domestic emission reduction projects, and help achieve Sri Lanka's emission reduction targets cost-effectively. As discussed in BB2, the Government of Sri Lanka is committed to developing an expanded crediting scheme not only to support private sector investment in offsets, but, more importantly, to provide an optimal policy package including CPIs, to enhance international financial flows (e.g. carbon finance and/or RBCF), and to build capacity for facility-level data collection and MRV.

Despite the significant mitigation potential in the energy, transport, industry and waste sectors, the scale of SLCCS has been limited to date, as discussed in BB2. Only three projects have been registered to date, and capacity within SLCF to cover all of the validation, verification and administrative functions for the SLCCS is not sufficient if the mechanism is to be scaled-up. Interest from the local private sector has been limited, in part because of the lack of GHG emission reporting requirements and overall lack of awareness of mitigation opportunities. At the same time, the NDC goals across the electricity, transport, waste and industrial sectors require substantial mitigation actions (see BB2) and new policy initiatives and mechanisms. Against this backdrop, BB4 Part I seeks the PMR's support to increase the scalability and robustness of SLCCS to enhance the scheme's role in achieving Sri Lanka's domestic emission reduction targets cost-effectively. A key input to BB4 will be the results of Output 2.1 in BB2, namely a decision on the strategic goals for the crediting scheme, and how it would relate to other CPIs. BB4 Part II focuses on support for designing new CPIs that would complement the SLCCS and support Sri Lanka in reaching their NDC goals, based on the policy analysis conducted in BB2.

For BB4 Part I, the main components for enhancing the SLCCS will be:

- Identify and assess approaches for increasing access to domestic/international demand (section 4.1.1)
- Identify and assess approaches for enhancing supply that are consistent with the objectives of the crediting scheme (section 4.1.2)

- Creating an enabling environment for a crediting scheme through enhancing the institutional, operational and technical capacity of relevant Sri Lankan actors in the scheme (section 4.2).
- Piloting and implementing the enhanced SLCCS (section 4.3)

In addition, section 4.5 presents the workplan, timeline and budget for BB4.

4.1 Designing a strengthened SLCCS

The sections below proceed through the major thematic areas for the enhanced SLCCS: demand, supply and (World Bank, 2017)

- **Environmental integrity:** selected options should aim to achieve the desired environmental outcomes, and should not affect other policy instruments' ability to achieve their desired environmental outcomes.
- **Economic efficiency:** selected options should achieve the environmental outcomes as efficiently as possible.
- **Simplicity and transparency:** the scheme's operational rules and parameters should be simple and transparent.
- **Market integrity:** the scheme should ensure robust operational standards and market stability.
- **Flexibility:** the design aspects of the scheme should allow it to respond to changing circumstances at both the domestic and international levels. This includes the fact that the SLCCS may need to adapt once new CPIs are implemented in Sri Lanka (e.g. to ensure that there is no conflict or overlap among different CPIs)

4.1.1 Enhancing demand for SLCCS

The first important questions for expanding the SLCCS are related to enhancing the sources of demand for the crediting program, because this will drive other decisions around supply choices and institutional needs. This section would also incorporate the analysis under BB2 and decisions on the strategic objectives for the enhanced SLCCS.

4.1.1.1 International versus domestic demand choices

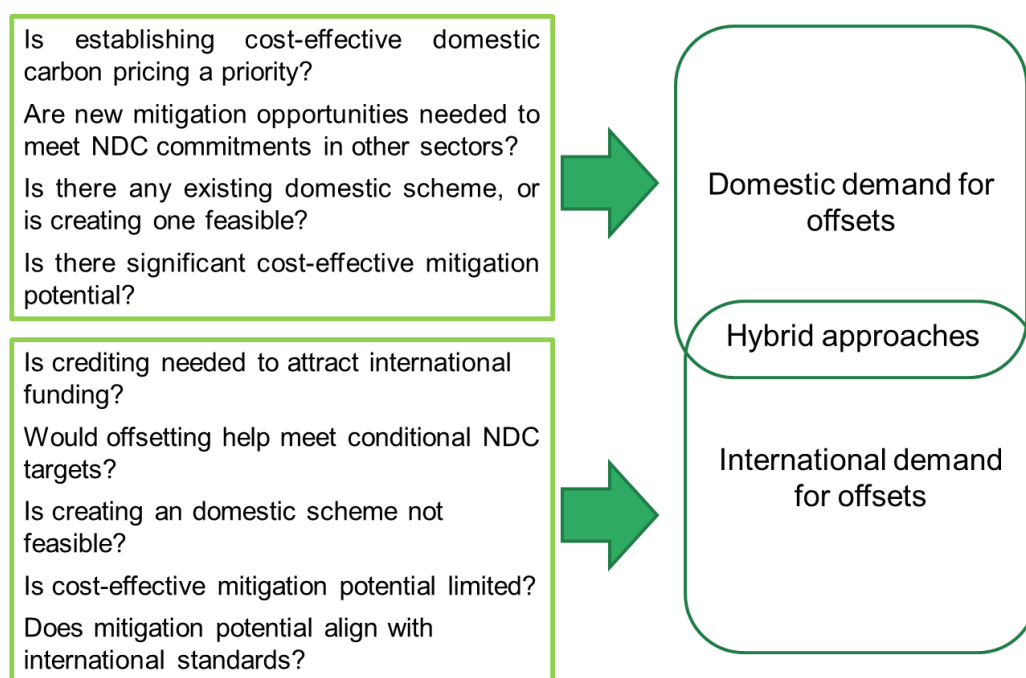
Possibly the most important challenge that the SLCCS faces currently is the lack of demand for carbon offset units. Because the SLCCS has initially relied entirely on domestic demand, and there are no regulations in Sri Lanka requiring mitigation action by any companies, the demand is only from the limited domestic voluntary market. There was some hope that Sri Lanka Airlines might use SCERs to offset flight emissions, but the airline uses CERs issued under the CDM instead, so this has not been a source of demand for local projects under the SLCCS.

The first activity under this part of BB4 will explore different international and domestic demand options for the SLCCS, to determine the right mix, and how this mix might change over time. Key factors that will be considered in this analysis are shown in Figure 27, and will build on the analysis in BB2. By way of explanation, where new mitigation instruments are needed to meet (unconditional) NDC commitments, cost-effective domestic carbon pricing is a priority, and there are large sources of domestic supply, prioritizing sources of domestic demand is often the preferred option. This is why BB2 proposes to investigate the mitigation potential and policy gaps in the four main sectors in Sri Lanka, to highlight sources of domestic demand, as well as explore other CPI(s) that might address these sectors and create demand for the SLCCS. This could be the short-term priority for SLCCS, because it would build local capacity for data collection and MRV, in a time when international markets are still under negotiation

and climate finance is ramping up. Where attracting international funding – including to meet conditional NDC commitments – is a priority, or coverage for a new domestic system is limited, focusing more on international demand may be more desirable. International demand may also be favored where mitigation options are more limited (e.g. small countries or countries with limited industry), because there are fewer local entities that might need credits. International compliance demand could be a longer-term priority for the SLCCS, since the rules for Article 6 may only be finalized and implemented in several years.

Because the factors related to the attractiveness of different demand sources may vary, schemes may target a mix of domestic and international demand, which could shift over time. This is likely to be the best strategy for Sri Lanka as well. This is particularly relevant in the next three years, because the rules of crediting and trading under the Paris Agreement are still until development, and the formal commitments from Parties begin in 2020. Note that targeting a mix of international and domestic demand does not mean necessarily using different standards or carbon accounting approaches, but rather reflects a strategic decision to about to what extent mitigation options are needed to meet NDC goals. For example, the SLCCS might only allow the transfer of credits to international buyers in certain sectors, where the Sri Lanka's NDC commitments can still be met even after transferring credits.

Figure 27. Policy, technical and economic factors relating to sources of demand

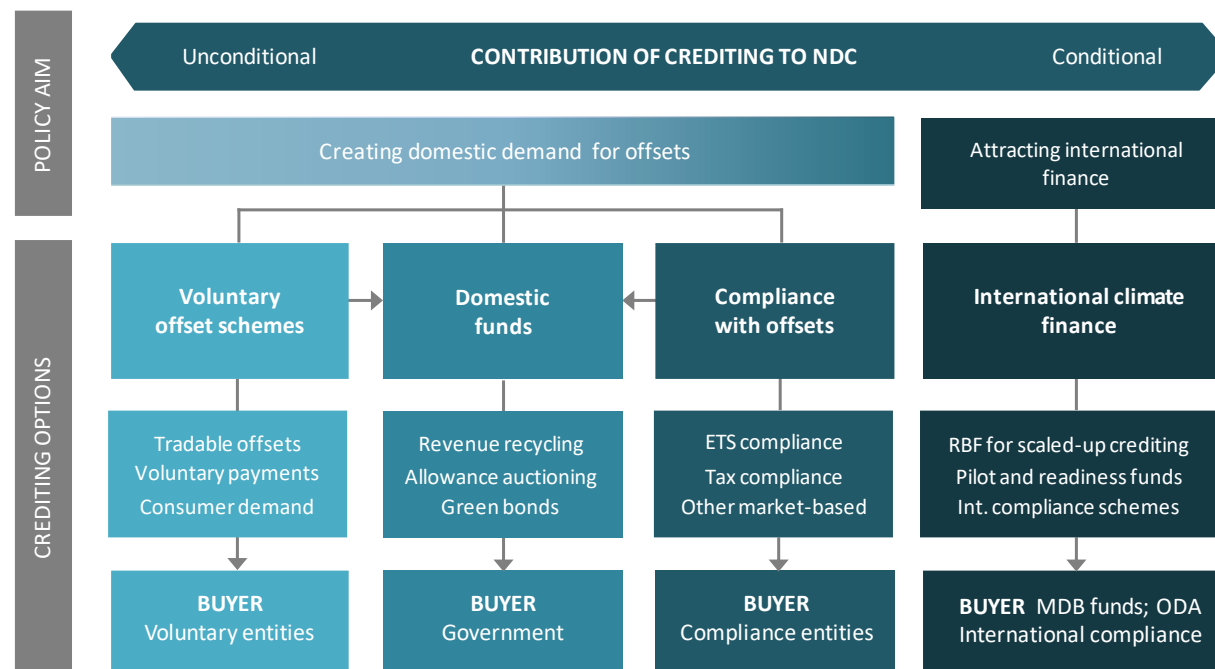


Source adapted from (World Bank, 2017 a)

Evaluating demand options is not only about international versus domestic demand, but also about the different categories of demand and their underlying drivers. This is illustrated in Figure 28. Domestic demand may include voluntary offsetting (which was the origin of the SLCCS), domestic public funds that target mitigation or compliance entities under another CPI such as an ETS or carbon tax. Creating additional domestic demand through new CPIs is addressed in BB4 Part II. For international demand, as discussed earlier, this includes both compliance demand from countries that use the traded units to

meet part of their NDC commitments and RBCF, where the mitigation outcomes are not used for compliance by the funder and therefore do not affect the host country's ability to use these mitigation outcomes toward their NDC goals.

Figure 28. Options to mobilize domestic funding for crediting



Source: (World Bank, 2017 a)

Different sectors have varying levels of maturity in emissions reporting and different downstream commercial drivers in terms of their current demand for CPIs and carbon offsets. Increased requirements for reporting emissions are mostly likely a pre-requisite for increases in demand for offsets, since targets cannot be monitored without basic emissions inventory data. This is why BB3 focuses on data collection and the regulatory framework needed to ensure accurate and comprehensive emissions reporting. In parallel, sustainability (i.e. compliance with the Global Reporting Initiative - GRI G4) remains a key driver across a number of sectors in Sri Lanka, which will be explored in BB4 in more detail. Specifically, for the air travel industry, BB4 will investigate the potential to align SLCCS with the requirements of the IATA offsetting scheme. Current industry experience with offsetting/crediting and also environmental reporting is presented in Table 21, and this will guide the assessment of future opportunities for domestic demand. Note that BB5 also discusses the key representatives and relevant industry bodies in each sector, which will be included in the stakeholder consultations as part of the BB4 modules.

Table 21. Qualitative assessment of emissions reporting and current demand for domestic carbon instruments by sub-sector

<i>Sector</i>	<i>Emissions Reporting Coverage</i>	<i>Demand Type</i>	<i>Instrument Type</i>	<i>Reason</i>	<i>Purchased SLCCS Credits</i>	<i>Overview of Sector's Demand Requirements</i>	<i>Key Representatives / Relevant Sector Bodies</i>
<i>Tea</i>	Medium	Voluntary	Offsetting	Carbon Neutrality		Product carbon offsetting undertaken by number of companies to access western markets	Sri Lankan Tea Board, Ethical Tea Partnership
<i>Hospitality & Tourism</i>	High	Voluntary	Offsetting	Carbon Neutrality		Carbon neutral hotel stays in some luxury hotels to attract western tourists	The Sri Lanka Tourism Development Authority, Sri Lanka Institute of Tourism & Hotel Management
<i>Apparel</i>	High	Voluntary	Offsetting	Sustainability		Product carbon offsetting undertaken by number of companies to access western markets	Sustainable Apparel Coalition
<i>Rubber</i>	Medium	-	-	Sustainability		Environmental compliance reporting across rubber industry is high. Further investigation required on offset purchases	Ministry of Plantation Industries
<i>Air Travel</i>	High	Compliance	Offsetting	Industry Requirement		Sri Lankan Airlines purchases offset credits through International Air Travel Associations' carbon offsetting scheme	Sri Lankan Airlines, International Air Travel Association

<i>Sector</i>	<i>Emissions Reporting Coverage</i>	<i>Demand Type</i>	<i>Instrument Type</i>	<i>Reason</i>	<i>Purchased SLCCS Credits</i>	<i>Overview of Sector's Demand Requirements</i>	<i>Key Representatives / Relevant Sector Bodies</i>
<i>Coconut</i>	-	-	-	-		Sector has not currently been approached	Ministry of Plantation Industries
<i>Construction</i>	Low	-	-	Carbon Reporting		Green building design increasingly being demanded by developers encouraging industry to adopt environmental reporting	Chamber of Construction Industry Sri Lanka, Sri Lankan Green Building Council
<i>Banking / Finance</i>	High	Voluntary	Offsetting	Carbon Neutrality		Green banking initiatives have improved sustainability reporting and resulted in some companies becoming carbon neutral	Sri Lankan Banking Association - Sustainable Finance Initiative
<i>Logistics</i>	Medium	Voluntary	Offsetting	Carbon Reporting		increasing requirement by multinationals to track logistics emissions is driving reporting in logistics sector. Some examples of offset purchases	Chartered Institute of Logistics & Transport
<i>Government</i>	-	-	-	-		Sector has not currently been approached	Urban Development Authority

<i>Sector</i>	<i>Emissions Reporting Coverage</i>	<i>Demand Type</i>	<i>Instrument Type</i>	<i>Reason</i>	<i>Purchased SLCCS Credits</i>	<i>Overview of Sector's Demand Requirements</i>	<i>Key Representatives / Relevant Sector Bodies</i>
<i>IT / Telecoms</i>	Medium	-	-	Sustainability		Multinational operators require local emissions reporting but any offset purchase is through corporate entity. Domestic environmental reporting high.	Multiple

This module will explore existing complementary domestic policies other than CPIs (e.g., regulatory requirements, financial incentives, or promotional programs such as carbon-neutrality schemes) that could be strengthened in order to stimulate domestic demand for credits (World Bank, 2011). In addition, Part II of BB4 will focus on new domestic CPIs that could create demand (see section 4.4).

Obviously, tapping into international demand – compliance or RBCF – will have different eligibility and technical requirements than relying solely on domestic demand. A key part of this analysis within BB4 will therefore examine the existing and emerging requirements of international demand sources and how they fit with the mitigation opportunities in Sri Lanka. Many of these requirements are still uncertain, however, because rules of crediting under the Paris Agreement are still being developed. Even for RBCF, many of these funds are still under development (World Bank, 2017 c), and the Green Climate Fund has, so far, been more focused on upfront climate finance. Nevertheless, there is a growing body of research that suggests that RBCF could be a “bridge” to future international crediting because it can begin immediately (i.e. before crediting rules are finalized) and does not affect the host country’s ability to meet with their NDC goals (Schneider, Spalding-Fecher, & Cames, 2015; World Bank, 2017 c). Because linking the SLCCS with international demand may be considered as a long-term goal, it will be important to consider options for enhancing the “link-readiness” of SLCCS to allow the scheme to be linked with new and existing markets internationally.

One final issue that will be considered related to international demand is how the emerging international rules will set baselines for crediting, and the links between baselines and NDC commitments. There are currently discussions about whether a country’s unconditional NDC commitments might provide a starting point for a crediting baseline, because this commitment represents the country’s official estimates of future emissions without additional external support (e.g. from crediting). Of course, Sri Lanka’s NDC mitigation commitments are given at a high level (e.g. energy sector, industry sector, etc.), and are specified as reduction versus a hypothetical “business as usual” case. Nevertheless, as part of assessing the “link readiness” of a crediting scheme within Sri Lanka, the link between unconditional NDC goals and baseline setting should be explored, to reduce the risks to that program in issuing credits that could be transferred internationally.

To explore all options related to demand from both domestic and international sources, the **deliverable** for this component would be the section of the “SLCCS Strategy Study” covering assessment and recommendation international and/or domestic demand options.

4.1.1.2 Enhance private sector confidence and engagement with the scheme

Promoting the SLCCS to the private sector in Sri Lanka is essential to creating demand in the short- to medium-term. BB4 will include the development of strategies to promote the benefits of the SLCCS to the private sector, as well as how to develop services that reduce the risk to investors and increase the robustness of the scheme.

Promoting SLCCS more aggressively will have to account for each sector’s commercial purchasing drivers for a local voluntary offset scheme in the short term. These commercial drivers for various industrial and service sectors are explained below and corresponding sectors provided in Table 22. The power and waste sectors have different drivers, because they are largely public sector companies that must respond directly to government guidance and regulation, rather private sector markets where GHG performance can deliver competitive advantage. In addition, while domestic demand for credits from the SLCCS may come from the power generation sector, this will depend on what policy instruments for

climate change mitigation are implemented in that sector. If the CPF program is further developed, for example, into a sectoral crediting mechanism for power generation, then this sector would generate credits rather than provide demand for them. Given the current nascent market for offsetting and corporate carbon neutrality in Sri Lanka, this component of BB4 will therefore focus mainly on understanding and expanding the private sector's demand for SLCCS generated credits. This will be revisited, however, as part of the BB4 Part II development of a new CPI, because this may create compliance demand from the private sector.

For the private sector, the advantages they would receive from voluntary offsets include the following:

- Domestic advantage in domestic markets: local voluntary offset schemes provide marketing value and differentiate organizations in the local business-to-business (B2B) and business-to-consumer (B2C) Sri Lankan market¹²
- Domestic advantage in international markets: local voluntary offset schemes provide 'value added' sustainability benefits when approaching international buyers for Sri Lankan products, and also help to avoid potential trade barriers that could emerge for more GHG emission-intensive products.
- International advantage in domestic markets: local voluntary offset schemes attract international customers (e.g. tourists) conscious of, for example, their climate impacts or other environmental issues
- International advantage in international markets: local voluntary offset schemes aligned with corporate or industry body requirements provide value added opportunities

Table 22. Drivers of commercial demand for CPIs/offsets by sector in various industrial and service sectors

LOCATION OF ADVANTAGE	MARKETS SERVED	
	Domestic	International
	Domestic Banking / Finance, Construction, Government, Coconut	Tea, Apparel, Logistics, Rubber
	International Hospitality	Air Travel, IT / telecoms

Aside from the commercial drivers presented above, one thing is clear from current experience of local voluntary offset purchases by organizations in Sri Lanka to date: the type of project and price per emission reduction unit is key:

- **Type:** For voluntary offsets, sectors often have greater interest in crediting projects related to their sector's activities. For example, the tea sector has greater appetite for offset projects related to agriculture and reforestation than for renewable energy.
- **Price:** At the organization level, price per ton of emission reductions influences project selection. For example, mixed project portfolios are purchased to minimize overall costs.

As part of this analysis, qualitative assessment of entities' willingness to pay will also be investigated – although commercial sensitivities may limit this research. Contacts established during MRP preparation

¹² For example, hotels might use voluntary offsetting not only to appeal to international visitors but also to local visitors.

with the Chambers of Commerce will be used as one way of accessing key industrial and commercial sectors. Outputs from this part of the project will include sector-specific analysis to determine activities to increase voluntary demand for the SLCCS.

This component will also consider what measures could enhance private sector confidence in robustness and integrity the scheme thus increasing demand for projects. While this may not be as important as promoting the benefits of the scheme or creating regulations that mandate the demand, they could become more important as the market grows:

- **Insurance services** for carbon market participants to address risks of non-performance
- **Consulting services**, from a range of private sector players, to advise clients about how to mitigate their carbon risks or capture carbon opportunities
- **Legal services and tools**, such as standard contracts that can be used by buyers and sellers

The **deliverable** for this component would be the section of the “SLCSS Strategy & Design Study” covering a strategy for private sector engagement and promotion of SLCCS.

4.1.2 Enhancing supply for SLCCS

Following on the discussion of the four main sectors analyzed in BB2, this component of BB4 will go further to identify sub-sectoral and major technology areas to enhance supply for the SLCCS, bearing in mind the outcome of the BB2 analysis on new CPI(s) that may be applied to specific sectors. In addition, because supply is related not only the mitigation potential but also to the methodological approaches and crediting standards used, the component will look at how the lessons from other crediting schemes on simplifying crediting standards could be applied in Sri Lanka.

Building on analysis conducted in BB2 on both the strategic objectives for the SLCCS and the types of CPIs that might be applied in the four major sectors, BB4 will conduct further analytical work to select sub-sectors and technologies where the SLCCS should be promoted. The following criteria could be considered when reviewing and prioritizing domestic offset opportunities (adapted from USAID (2014)):

- **Total mitigation potential:** the total amount of emission reductions achievable, based on marginal abatement costs (see below), for a set target period
- **Feasibility and cost effectiveness:** the lowest expected cost of achieving a set amount of emission reduction, and considering potential technical, institutional or regulatory barriers.
- **Sustainable development benefits and national priorities** (building on BB2): the sub-sector’s relevance to domestic priorities for sustainable development as identified in BB2 (e.g., reducing traffic, reliance on fossil fuel, or air pollution)
- **Avoiding conflict with other CPIs:** if a sector may already have a crediting scheme in place (e.g. the CPF program in the power sector), it cannot supply credits for two alternative schemes. If, on the other hand, a sector will be covered by another CPI which could use offsets (e.g. carbon tax or ETS), then those offsets against those compliance obligations would need to come from outside the sector to prevent double counting of mitigation efforts.
- **Private sector actors:** the willingness of entities in the sector to participate in the crediting scheme. Activities that require substantial policy actions or government-sponsored measures for implementation are lower priority.
- **Methodological challenges:** the feasibility of developing a rigorous carbon offset methodology for the sub-sector or major technology area:

- **Quantification:** how difficult it would be to measure and quantify GHG reductions associated with the opportunity. This may consider the uncertainties in estimating baseline emissions and leakage effects.
- **Data availability:** availability of data needed to (a) quantify GHG reductions associated with an activity; (b) estimate baseline emissions; and (c) determine common practice and/or establish performance standards
- **Verifiability:** the challenges in verifying the implementation and performance of the abatement activity
- **Permanence:** whether GHG reductions associated with an activity could be reversed (e.g., if carbon stored by an activity is subsequently released to the atmosphere). This is primarily a concern with carbon sequestration projects.
- **Ownership:** whether there are competing ownership claims to the GHG reductions achieved by the activity.

Figure 29 below provides examples of the sectoral scope of other international and national crediting schemes. One of the reasons behind the sectoral scopes for the national and sub-national schemes is to avoid overlap with CPIs or climate policy instruments in other sectors.

Figure 29. Project types covered by different crediting programs

	Renewables and energy efficiency	Coal mine methane	Waste management	Agricultural manure	N ₂ O abatement	Other industrial gases	Agricultural practice	ODS destruction	Afforestation and reforestation	Protection of existing forests	International scope
CDM											
JI Track 1											
AU CFI											
CA COP											
CCER											
Québec											
CH OP											
JCM											
CAR											
GS											
VCS											

Note: AU CFI = Australia's Carbon Farming Initiative; CA COP = California's Compliance Offset Program; CAR = Climate Action Reserve; CCER = China CER; CDM = Clean Development Mechanism; CH OP = Switzerland's Offset Program; GS = Gold Standard; JCM = Joint Crediting Mechanism; JI = Joint Implementation; Québec = Québec's Offset Program; VCS = Verified Carbon Standard.

Source: (World Bank, 2015 c)

The **deliverable** for this component would be the section of the “SLCCS Strategy & Design Study” covering identification and prioritization of specific sub-sectoral supply options for the SLCCS.

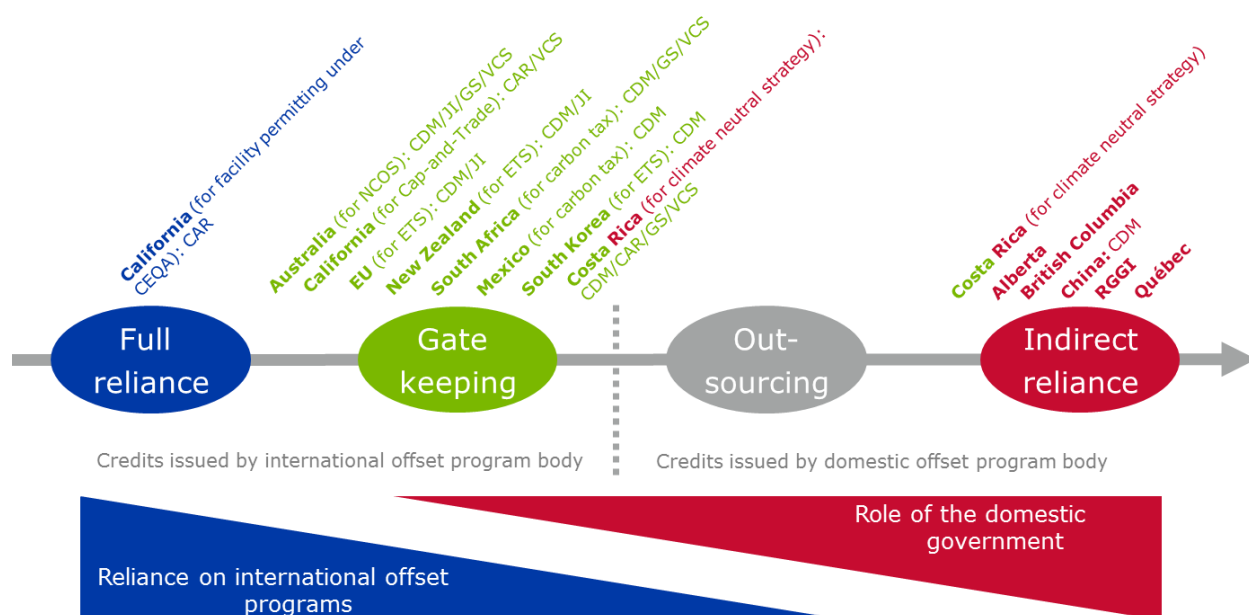
4.2 Designing the institutional, legal and methodological framework

This component of BB4 follows the demand and supply options because the investments needed in institutional, operational and legal infrastructure depend on the scope of the crediting scheme, how much international infrastructure is used, and the demand markets that are targeted. In addition, the Government of Sri Lanka intends to create a system where the administrative burden of the crediting scheme does not outweigh the available budget and benefits of the system. While the existing institutional framework for the SLCCS was described in section 2.2.1, this may need to be carefully assessed and modified depending on the scope and objectives of the enhanced SLCCS.

4.2.1 Leveraging international offset programs

One critical decision for the SLCCS is to what extent it will rely on other international crediting programs to fulfil certain functions (e.g. developing methodologies, accrediting auditors, or even issuing units). The PMR Technical Note on “Options to use existing international offset programs in a domestic context” illustrates four different approaches and how these impact the role of the domestic government. As Figure 30 shows, greater reliance on international offset programs can reduce the administrative requirements for the domestic government, which is why some variation of these approaches is often followed by other national and regional crediting schemes.

Figure 30. Options for leveraging international crediting schemes



Source: (World Bank, 2015 b)

The precise roles of the domestic government and international crediting schemes can vary across the different components of the scheme. Figure 31. illustrates three of the major options – “full-reliance”,

“gate keeping”, and “out-sourcing” – and what they mean for the following components of a crediting scheme:

- Governance & institutions: the roles and responsibilities of the main bodies in the program
- Project cycle & regulations: the main steps of the project cycle, from project design to credit issuance
- Costs & revenues: the cost of running the program, the revenue for project developers and the transaction costs to generate credits
- Liabilities, non-permanence risk & appeal: the distribution of risks and liabilities, and how grievances are addressed
- Scope: which GHGs, sectors, technologies and geographies are covered
- Methodologies & tools: how methodologies are developed, approved, and/or incorporated into the program
- Validation, verification & accreditation: how third-party validation and verification entities are accredited, and which guidelines they follow
- Registry: what project, credit and transaction information is recorded and how transactions are managed
- Market information: how information on projects, credits, prices and buyers is captured and disseminated

For the current SLCCS setup:

- Governance and institutional structure and project cycle are explained in BB2 (see section 2.2.1).
- Administrative costs of the program are borne by the government, while the costs of project development are borne by the project developers.
- liability and appeal have no specific provisions.
- For methodologies, any approved methodology from the CDM or other recognized international standard may be used, or a new methodology may be proposed, so the scope is very wide – although, in practice, the scheme has been limited to small scale hydropower.
- Validation and verification have been conducted by SLCF, although other auditors may also be allowed accredited under other international standards.

The current SLCCS is therefore closer to the “outsourcing” model than the other models below, but if local methodologies were developed then it would be similar to the “indirect reliance” model as well. This component of BB4 would explore to what extent the SLCCS should draw upon other international offset programs, and engage with stakeholders to decide on the best approach for the SLCCS. That strategic decision would then guide the more detailed institutional and capacity development.

Figure 31. Option for incorporating international offset standards into a domestic offsetting scheme

“Gate Keeping”		“Outsourcing”		“Indirect reliance”	
Designed and run by <i>international</i> program	Designed and run by <i>domestic</i> program	Designed and run by <i>international</i> program	Designed and run by <i>domestic</i> program	Designed and run by <i>international</i> program	Designed and run by <i>domestic</i> program
1. Governance & institutions			1. Governance & institutions	None. The domestic program is fully designed and run domestically.	1. Governance & institutions
2. Project cycle & regulations	2. Option: domestic process of review of projects and credits		2. Project cycle & regulations		2. Project cycle & regulations
3. Costs & revenues			3. Costs & revenues		3. Costs & revenues
4. Liabilities, non-permanence risk and appeal			4. Liabilities, non-permanence risk and appeal		4. Liabilities, non-permanence risk and appeal
5. Scope	5. Option: domestic restrictions on scope of international program		5. Scope		5. Scope
6. Methodologies & tools	6. Option: methodologies for domestic review and approval process	6. Option: outsourcing of methodologies & tools	6. Option: domestic methodologies & tools		6. Option: domestic methodologies & tools
7. Validation, verification & accreditation	7. Option: domestic restrictions on VVBs	7. Option: outsourcing of validation, verification & accreditation	7. Option: domestic validation, verification & accreditation		7. Option: domestic validation, verification & accreditation
8. Registry	8. Option: domestic registry (can be outsourced to service providers)		8. Domestic registry (can be outsourced to service providers)		8. Domestic registry (can be outsourced to service providers)
9. Market information			9. Market information		9. Market information

Source: (World Bank, 2015 b)

4.2.2 Institutional structures and responsibilities

The objectives of the institutional, legal and operational framework are as follows:

- Implement the overarching policy and regulation consistently and transparently
- Establish a coherent government structure that clearly outlines the roles and responsibilities of various institutions and that fits the strategic objectives of the scheme
- Manage on-going feedback with all stakeholders
- Provide a platform to analyze and implement regulatory improvement
- Implement business processes based on regulation,
- Build appropriate capacity and capability to implement the overarching policy and regulation
- Be financially sustainable, ensuring that user fees and other income can cover the costs of the administration of the crediting scheme in the long run

Once the role of domestic versus international institutions and crediting scheme element is clear, the main institutional functions must be allocated across different bodies. As noted in Table 12 in section 2.2.1.2, crediting schemes typically have three key institutional structures: Executive Body, Administrator, Validation & Verification Body. In addition, many schemes include Advisory Bodies that provide technical support to the Administrator and Executive Body. While validation & verification bodies are almost always third-party auditors who provide an external check on project eligibility and performance, the roles of the Executive Body and Administrator varies across schemes. Box 2 illustrates the functions that must be covered by the Executive Body, Administrator and Advisory Bodies. Each of these functions will require the development of the necessary capacity, as well as decisions on the appropriate institutional structure for implementation.

Box 2. Ranges functions required for a crediting scheme

Policy-related functions:

- Set the principles and strategy for crediting scheme
- Co-ordinate and interact with international financiers and donors

Oversight functions:

- Guide and oversee the work of the Administrator
- Review executive decisions made by the Administrator, if applicable

Executive functions:

- Certify emission reductions
- Approve/accredit auditors for verification
- Approve program standard and rules of procedure
- Approve methodologies and guidelines, including forms and templates;

Administrative functions:

- Develop/revise program standard and rules of procedure
- Develop methodologies and guidelines, including forms and templates
- Listing/registration of eligible programs
- Training locally-accredited auditors, where applicable
- Undertake completeness checks and reviewing verification reports
- Maintain a registry of programs and emission reductions
- Support Executive Body meetings

Note: excludes validation and verification functions by third-parties

Source: adapted from (Spalding-Fecher, et al., 2017)

One approach to the functions presented in Box 2 is to concentrate most of the policy, oversight and executive functions with the Executive Body. This is similar to the CDM, where the CDM Executive Board is directly involved in approving projects, methodologies and updates to the rules. Another model, however, for the Executive Body to focus mainly on the policy and oversight functions. This is the case with the Gold Standard and the Verified Carbon Standard (VCS)¹³. Under this approach, the Administrator handles not only the administrative functions listed above, but also lists/registers projects, approved changes to methodologies and procures, and may approve the issuance of emission reductions. This component of BB4 will evaluate the most appropriate approach for the SLCCS, based on the objectives of the scheme, existing institutional structures, and capacity requirements. Under the current SLCCS, the SLCF has been serving as the Administrator, although this presents challenges because of the limited staffing, as well as potential conflicts of interest between the role as

¹³ In the case of the VCS, the strategic direction is defined by the VCS Board of Directors, whereas day-to-day operations are carried out by the VCS Secretariat (approving projects, coordinating registry functions, request issuance of credits, etc.)

administrator and the SLCF roles as validator and verifier for SLCCS projects. A scaled-up SLCCS might need a larger, independent administrator, and this would be considered in the BB4 analysis.

In addition to the functions above, Sri Lanka proposes in this component of the MRP to clarify what additional functions the Administrator might take on to enhance the performance of the crediting scheme. These could include the following (adapted from (World Bank, 2017 b)):

- **Core business processes:** The administrator needs to understand and define the core business processes underpinning the mechanism. The process definitions will be used to assist in the technical implementation elements of the scheme along with definition of capacity and training needs.
- **Statutory reporting:** There are four key types of data reporting, in which the Administrator may play a role, in combined with other institutions in Sri Lankan climate policy (e.g. the Climate Change Secretariat):
 - *Statutory reporting:* The domestic and international legal obligations placed on administrators to report specific data at specific times within the 'compliance' cycle.
 - *Data reporting:* The schemes' own need to collect and report data.
 - *Activity reporting:* The reports that show level of activity in the scheme such as number of participants, project activities, etc.
 - *Ad-hoc reporting:* requests from internal or external parties interested in specific data queries.
- **Business intelligence:** Business intelligence means understanding the behavior of scheme participants and data in the system. Using modeling scenarios, defined business rules, and robust data within the system, critical actions or suspicious behavior can be flagged to the administrator, assuming the crediting scheme is of sufficient scale.
- **User support:** User support is needed through a centralized helpdesk where scheme participants can raise issues. This is ideally linked to a knowledge management system for updating and sharing resolutions to common issues. The purpose is to troubleshoot problems and provide guidance about services, including both the domestic and international rules and procedures. Various communication channels such as email, websites and telephone services can be provided.
- **Market information services:** providing the details of trading activity, and prospective activity, given trends in underlying fundamentals that lead to demand and supply, can increase confidence among project developers and potential carbon credit buyers. This could also include organizing forums for buyers and sellers to connect with each other, ranging from formal carbon trading exchanges to web-based platforms accessible from smart phones.

This component would also include developing recommendations for the composition, mandate and authority of an Executive Body for the enhanced SLCCS. Such a body would derive its authority from specific Ministries including the MMDE as the UNFCCC focal point. The Body might also include representatives of these Ministries and their Departments, as well as other stakeholders in some cases. This is because, if the scheme eventually included international crediting, the transfer of units outside of Sri Lanka would be part of the Paris Agreement, and so the responsible Ministries for the UNFCCC would need to authorize these transfers. This Body would also need to consider the financial sustainability of the crediting scheme, and what user fees or other sources of income would be necessary to cover the administration costs, particularly after the end of the PMR support.

The **third-party auditors** that support the accreditation of offset projects require rigorous training to ensure informed and independent decision making. For the initial SLCCS projects, SLCF provided the validation and verification services, although the guidelines allow for entities accredited under other schemes to do this as well. While accrediting additional local auditors may increase local control, it would also increase local resource requirements from government. BB4 will seek to better understand the institutional capacity and relative merits different technical approaches to project verification and validation within the SLCCS.

Table 23. Options for auditors under the SLCCS

	ADVANTAGES	DISADVANTAGES
OPTION 1 – SLCF ONLY AS AUDITOR	More adapted to local context Increased control	Higher resource requirement Potential lack of international acceptance Potential conflict of interest (i.e. SLCF as auditor and administrator)
OPTION 2 – AUDITORS ACCREDITED UNDER OTHER INTERNATIONAL SCHEMES	Lower resource requirement International acceptance	Less adapted to local context Decreased control
OPTION 3 – OPTION 2 + LOCAL ACCREDITATION	More adapted to local context Increased control	Much higher resource requirement (i.e. for new accreditation process) Potential lack of international acceptance

Note that if the SLCCS chooses to utilize auditors currently accredited under other crediting schemes (e.g. CDM, VCS, JI), then the accreditation process and training would not be the responsibility of the SLCCS itself. If the SLCCS allows for local auditors who have not been accredited under other schemes, however, then a training and accreditation program would be required. This could include:

- Technical and ethical training, based on modalities and procedures for SLCCS
- Accreditation of all experts, in accordance with the selected MRV approaches, to ensure that experts have the necessary expertise, experience and knowledge of the SLCCS to audit the compliance of projects, protocols and activities in the system
- Guidance in the oversight and accreditation of carbon experts

Further, relying primarily on locally-accredited auditors may have not only differences in training and capacity building, but may also have increase the cost of registering projects. For example, if there is insufficient supply of locally-accredited auditors, international auditors from outside Sri Lanka may have to be utilized – which would have an impact on verification costs.

The **deliverable** for this component of BB4 would be the section of the “SLCCS Implementation Study” on the recommended institutional and legal framework.

4.2.3 Developing simplified rules, procedures and methodological approaches

The technical capacity required to successfully operate a crediting scheme depends on how the scheme approaches GHG reduction methodologies, MRV and the project cycle. If the SLCCS primarily uses components of existing international offset programs, then less technical capacity will be required locally to manage the system. Conversely, the more of the project cycle and MRV methodologies that are developed locally, the greater the administrative and technical requirements for the SLCCS and Government of Sri Lanka.

The **deliverable** for this component of BB4 would be recommendations on methodological approaches, project cycle simplifications, and recommendations on linkages with the national registry, as well as identification of the related capacity building needs, as part of a “SLCCS Implementation Study”

4.2.3.1 Assessing the need for methodology development, and bottom-up vs. top-down approaches

Most crediting scheme options include the use of methodologies from international standards. The “gate keeping” and “outsourcing” approaches also keep open the possibility of developing new domestic methodologies, under the guidance of the domestic crediting scheme governance structure. The current SLCCS guidelines also say that a project promoter may use a SLCCS-specific methodology, although so far no new methodologies have been proposed or evaluated.

There are several important benefits of using methodologies from international offset programs. First, this would dramatically reduce the administrative and technical capacity requirements – and corresponding costs – of the SLCCS. A domestic methodology approval process will require significant investments in personnel and skills. Second, using methodologies with international approval could increase the likelihood that the results credits would be accepted under a future international trading system. While there is no guarantee, of course, methodologies that have been subjected to rigorous international review may be lower risk than locally developed methodologies, in terms of eventual acceptance for international transfers under the Paris Agreement.

BB4 would examine where developing new methodologies under the SLCCS is beneficial for the following reasons:

- There are significant mitigation opportunities in Sri Lanka that would not be eligible under any existing methodology in international crediting standards, or
- There are significant mitigation opportunities that are addressed by existing international methodologies, but there are opportunities to simplify and streamline these methodologies to increase their cost-effectiveness and impact. There could even be cases where these simplifications have been proposed under the CDM or similar standard but have not yet been implemented.

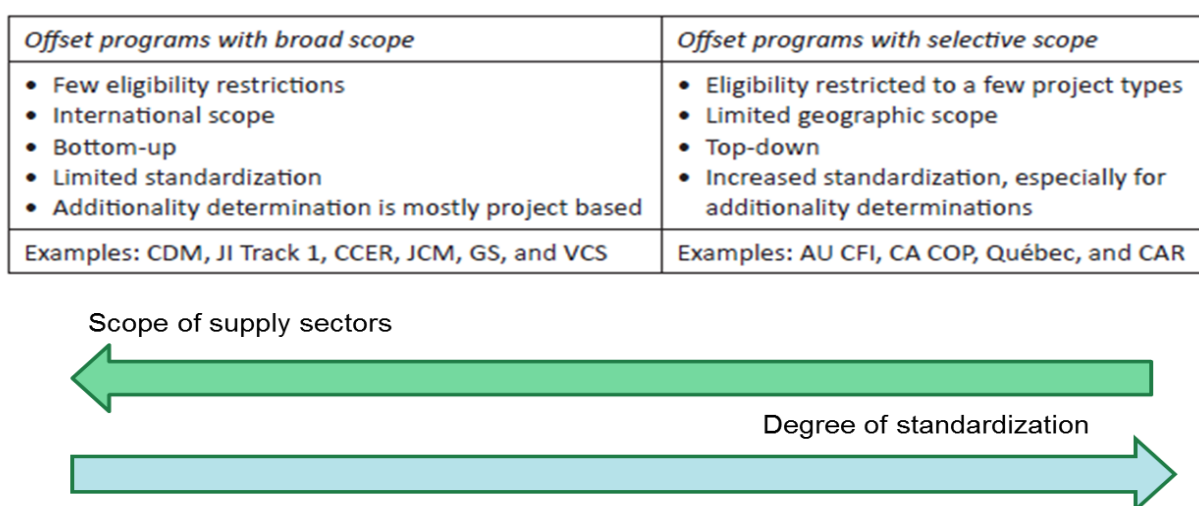
In cases where the SLCCS does allow for new country-specific methodologies, the underlying approach for methodology design may have a significant impact on the scope and efficiency of the scheme.

Overall, there are two broad approaches to methodologies within crediting schemes:

- **Bottom-up approach:** Many crediting standards, such as CDM, VCS and Gold Standard, tend to use a bottom-up process to develop project methodologies. Under a bottom-up process, methodologies are typically developed by individual project participants who propose specific methodological approaches for their project. These are then evaluated and approved by the relevant authority of the offset programs. Offset programs that use a bottom-up process tend to have a broader scope in terms of geographic coverage and in terms of project eligibility.
- **Top-down approach:** Top-down approaches are developed by the program institutions themselves, usually in consultation with external experts and stakeholders. Crediting schemes that are more selective in terms of their geographic scope and their project type eligibility often use a more top-down approach. By doing this, these programs aim to reduce the cost for project developers and provide more predictability (in terms of ensuring that a project will be eligible). Most programs use a combination of top-down and bottom-up approaches.

Another factor to consider in the cases of SLCCS-specific methodologies is the level of standardization. All approaches use standardization to some extent, for example in setting baseline emissions and for simplifying certain parameters for project emission calculations. Such standardization tends to reduce costs and risks for project developers. For example, under a “positive list” approach (or list of predetermined eligible project types), all projects of a particular type are automatically deemed additional and therefore do not have to go through a lengthy process of proving additionality for each individual project. Crediting schemes that use a more top-down approach to methodology development also tend to use a more standardized approach to determining additionality and baselines. As discussed above, these are often, but not always, programs with a narrower project type focus.

Figure 32. Relationship between scope of program and degree of standardization



Source: adapted from (World Bank, 2015 c)

Even programs that were originally set up with a bottom-up approach—often to be able to start rapidly and to be open to different mitigation opportunities in different contexts and countries—have recently started to use more top-down, standardized approach may include, common criteria applicable across multiple methodologies. Table 24 compares the key differences between a project-based and fully standardized approach.

Table 24. Key differences between project-based and fully standardized approach for crediting

Project-based	Fully standardized
<ul style="list-style-type: none"> • Can take project-specific conditions into account (e.g. baseline, monitoring, additionality) • In-depth project evaluation is necessary for each individual project • Evaluation often have subjective components • Typically, project-specific additionality test (e.g. investment ND barriers analysis) that take into account project-specific conditions 	<ul style="list-style-type: none"> • Common standards applied to all projects of a given type • Simplified, more transparent, and streamlined project approval process • Subjectivity during the design phase of the standard (e.g. decisions on the stringency level) • Additionality of a project can be easily determined and is based on predetermined criteria (e.g. emission threshold, or technology list)

<ul style="list-style-type: none"> • Expensive and time-consuming for project developers and evaluators • Project developers may face risk of project rejection 	<ul style="list-style-type: none"> • Costly and time-consuming to design (and update) • Reduced risk of project rejection during the approval process
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Source: (World Bank, 2015 c)

4.2.3.2 Streamlined procedures including project cycle

The underlying project cycle, including approaches to MRV, of the SLCCS is key to ensuring the environmental integrity and efficiency of the scheme. In this context, a needs assessment to evaluate the current capabilities of SLCCS's project cycle and MRV will be conducted to identify areas for improvement. One example of streamlining is combining validation and verification, so that projects use a simplified "checklist" approach to join a crediting program, and an auditor verifies both the performance and eligibility after project implementation. This allows projects to be implemented and start earning credits much more quickly, because there is no long validation period. Such an approach has been discussed in several proposals (Carbon Limits & Climate Focus, 2016; Platonova-Oquab, et al., 2012) and is currently being piloted by the Carbon Initiative for Development (Ci-Dev) in Senegal. As another example, the government institutions that are part of the SLCCS governance structure could support project developers in securing the Sri Lankan government permits and approvals necessary for project implementation, so that these parallel processes do not delay implementation of the crediting project.

The evaluation of streamlining options may be guided by the following principles:

- Ensure the **transparency and clarity** of the stages and methodologies
- **Recognize international best practices**, to optimize the credibility of the domestic scheme and provide confidence for both domestic and potential international buyers. This would also ensure the scheme's readiness to link with emerging international markets.
- Ensure integration and **alignment with the national MRV system** proposed under BB3
- **Simplify the verification process** to lower the transaction cost and increase the efficiency of the system

4.2.3.3 Simplify the methodology and MRV for key project types

BB4 will consider options for simplifying the methodology and MRV approach for high priority supply sources. Whether these are relevant will depend on the specific project types. For example, positive list approaches for additionality have worked most reliably for project types with no other source of revenue/benefit other than carbon revenue (Erickson, Lazarus, & Spalding-Fecher, 2014). Some of the options that could be applicable for the relevant project types in the SLCCS include the following:

- **Positive lists for additionality:** more extensive use of positive lists to determine the eligibility of projects for crediting, rather than requiring detailed project-specific analysis of financial and technical characteristics. This is already widely used in many crediting standards, and could be adapted for specific target sectors in Sri Lanka.
- **Standardized emission reductions:** going beyond a standardized baseline emission factor to provide a default value of emission reduction per unit installed. An example is solar lanterns, where an approved CDM methodology allows the project developer to receive a fixed amount

of carbon crediting for each operating lamp that is sold. This reduces the monitoring costs for crediting projects.

- **Simplified MRV approaches:** examples of these include flexible requirements for calibration and accurate of monitoring equipment, reducing the frequency and scope of site visits, using qualified local experts for site visits, and digitization of the entire MRV process (Greiner, Kolmetz, Betzenbichler, Houshyani, & Galt, 2015).

4.2.3.4 Link with national registry

BB3 also seeks PMR's support to (a) develop and improve the individual registry for SLCCS; and (b) link the scheme's registry any other national registry functions or registries for other CPIs to avoid double counting, and enhance the transparency and environmental integrity of the scheme.

As an input to BB3, Sri Lanka seeks PMR support to develop the part of the national registry system that would provide specific functionality to support the SLCCS. A more in-depth analysis is proposed during the PMR implementation phase to identify and develop the key requirements for the SLCCS component of the national registry system. This work will likely require steering committees, advisory committees and working groups to support its work in specific areas. Broadly, components of SLCCS's registry functions may include, among others:

- **Projects Registry** would record registration for those mitigation projects and programs that fulfill the eligibility criteria for the crediting scheme, and those that move to the verification process. The registry should contain the basic data of each project participant and project that is necessary for the identification and traceability of both the project and the SLCERS generated by it. The information contained in this record will include, among others: project name; project code; name of developer; other participants/co-holders; type of project/methodology or protocol used; location; crediting period; quantity of SLCERS generated in a given monitoring period
- **Transaction Registry** would track the exchange of units and their status, validity, and expiration date (if applicable). This registry would enable market participants to record their transactions and/or request to transfer or cancel them.
- **Qualified Carbon Auditor Registry** could be a list of accredited experts who offer validation and verification services for crediting projects.
- **Participants Registry** would list the companies or institutions that are developing projects or that intend to purchase credits from a project developer.

4.3 Piloting the enhanced SLCCS

Based on the design work in the previous components of BB4, the enhanced SLCCS would then be piloted for several high priority project areas. There will already be institutional readiness to implement the pilot and increased awareness, since relevant stakeholders will be engaged in the process and previous outputs. Before the enhanced SLCCS can be implemented, however, due policy approval process needs to be followed and the capacity building plans must be initiated. The results of the pilot can then strengthen the political support for the SLCCS, and further increase private sector interest. The proposed length of the pilot and the process for assessing the pilot will be discussed and confirmed with stakeholders during the earlier design stages.

Piloting will test the enabling environment and help develop a new pipeline of projects for the SLCCS, and allow for corrections before full implementation. While the pilots may be implemented for a short duration under the PMR activities, the experience and buy-in from decision makers will ensure that the

activities will continue even beyond the PMR support. A key decision will be in what sectors the SLCCS should be piloted. As discussed earlier, focusing on sectors not covered by other CPIs would do more to strengthen Sri Lanka's overall "readiness" for carbon pricing and would also reduce the risks of double counting of mitigation actions. This could mean a focus on industry, for example, rather than the power sector, if the latter is covered under the CPF program as an example of scaled-up crediting. Such a pilot could also run in parallel the BB3 pilot activities, and linking new emissions reporting requirements to a national MRV framework.

Piloting and implementation of the enhanced SLCCS will include the following activities:

- **Establish institutional and legal framework:** the recommendations on institutional, legal and operational framework for SLCCS will be implemented. This could include regulatory approvals, setting up new bodies or amending the responsibilities of existing bodies, and enhancing the operational functions (e.g. reporting systems, market information services) within the SLCCS.
- **Implement capacity building and stakeholder engagement plans:** the capacity building strategy will be designed, along with the engagement of stakeholder during the piloting and implementation process. The recommended activities, which could include the training of staff, implementation of new internal systems and procedures, and outreach workshops, will then be implemented under BB5
- **Link to registry or create registry:** depend on the outcomes of BB3 and the analysis under section 4.2.3.3, appropriate linkages among the relevant registries will be created. Any new components required for the SLCCS registry will be developed, tested, and commissioned.
- **Promote to private sector:** the strategy for private sector engagement and promotion of SLCCS created under 4.1.1.2 will be implemented. This may include a wide variety of tools to raise awareness and seek engagement, including via industry associations. These channels would also explain the support available for project development (see below)
- **Support project development:** to kick-start the enhanced SLCCS, support will be provided to 2-3 example projects with potential for replication. This support could include technical assistance with developing the project analysis and documentation, as well as covering all or part of the cost of validation.

The **deliverables** from these activities would include:

- Completed institutional and legal framework (i.e. necessary structures and regulations are in place)
- Piloting of the enhanced SLCCS (i.e. development of project pipeline)
- Impact assessment report on pilot implementation – a review of the experiences from the pilot projects.

Part II. Modules for new CPI

Sri Lanka is also requesting support from PMR to explore additional mechanisms and policy instruments to reach their NDC goals. Following the analysis in BB2 of what additional CPIs could support Sri Lanka's NDC goals, the purpose of this component of BB4 is to design a "roadmap" for the introduction of a new CPI in Sri Lanka that would be complimentary to the SLCCS. Some important for the new CPI include:

- To support NDC implementation and other major policy objectives, particularly where are gaps between the long-term goals and the existing and planned policies.

- To help Sri Lanka move to more sustainable low carbon development pathway, as envisioned in the “Sri Lanka Next – Blue-Green Development” strategy, by providing financial incentives for the technologies identified in this strategy that could be supported by carbon pricing
- To build local institutional capacity to develop, implement and participate in low carbon development markets (domestically and internationally)
- To create domestic demand for the enhanced SLCCS

Given the time constraints and prioritization of tasks related to MRV and SLCCS, the proposal in Sri Lanka’s MRP focuses on the scope under this component to the *design* of a new CPI and developing a “roadmap” for its implementation. The roadmap developed during MRP implementation would include the action plan for piloting and implementation activities, which would happen after the end of this phase of PMR support. This roadmap would include a plan for how Sri Lanka would resource the implementation for the new CPI beyond the period of PMR support. For example, it would identify the sources of funding and human resources that would be needed to implement the new CPI, including other sources of international climate finance.

4.4 Developing a roadmap for a new CPI and potential linking to the SLCCS

Many of the high-level design principles have been discussed earlier in BB2 and the sections on the SLCCS. These include the importance of setting overall objectives for the instrument, identifying the sources of supply and demand within the context of the specific instrument (e.g. scope of an ETS or carbon tax, and whether offsets are allowed), and creating a strong enabling environment. This component of BB4 would apply key criteria to design successful components of a new CPI, as part of a “roadmap” to piloting and implementing a new CPI.

The **activities** included in this component would include the following:

- Prepare detailed technical and financial feasibility study for new CPI: based on the selection of CPI in BB2, develop a full feasibility study to the new CPI.
- Consult stakeholders on new CPI: throughout the design process, stakeholder engagement would be conducted, particularly with the potential private sector actors in the new CPI (e.g. those entities subject to a carbon tax or part of an ETS).
- Design new CPI on basis of the strategic plan for CPI contribution to NDC goals (see section 4.4.1 and 4.4.2 below)
- Analyze options for using new CPI to create demand for SLCCS (see section 4.4.3 below)

The **deliverables** for this component of BB4 could include the following:

- Technical and financial feasibility study on new CPI
- Roadmap for piloting and implementation of new CPI, including possible linking to SLCCS to create demand and explanation of how stakeholder consultations were used in the design of Roadmap

4.4.1 Key criteria for CPI design

The new CPI selected would be developed further for piloting and implementation. The CPI would be designed using the following principles (adapted from (World Bank, 2017 b)):

- The objectives of the new CPI **align** with existing national policies and priorities, and contribute to Sri Lanka's low carbon development pathway.
- The new CPI is the most efficient and **cost effective** option to ensure low carbon development in Sri Lanka.
- The CPI provides a stable and **predictable mechanism** for positive market signals to the private sector and contributes to accelerating growth in Sri Lanka through private sector participation.
- The new CPI **builds local capacity** and creates job opportunities supporting more inclusive economic growth.
- The new CPI ensures **environmental integrity** by avoiding double counting of emission reductions.
- The new CPI is informed globally but **designed locally**.
- The new CPI is **flexible** and can be adapted to changing circumstances that might result from the evolving international climate regime.

4.4.2 Design components of a CPI

This component of BB4 would include support to design the main components of the new CPI (e.g. legal, institutional, operation, registry, etc.), bearing in mind the design criteria above. The design process would include the following steps (adapted from (World Bank, 2017 b))

- **Defining the scope:** The emphasis would be on identifying sectors, sub-sectors or major technology areas to be covered under the new CPI. The availability of data and the ease of implementation and monitoring would influence decision-making at this stage. Given the diversity of end-user in most sectors, it would be difficult to implement a mechanism where downstream users are the point of regulation as the number of such users would be large, making implementation and monitoring challenging.
- **Identifying the regulator:** On the basis of the sector or sub-sector chosen, entities or existing institutions may be identified to regulate the new CPI. For the CPI to be successful, a strong foundation of data and institutions would be required, as discussed earlier for the SLCCS. One of the important aspects in identifying a regulator will be its policy mandate, ability to generate data, build stakeholder consensus, and exert authority. Hence, the regulator should be an authority that can play regulatory, legislative, and administrative roles.
- **Setting a baseline and targets:** The most critical step is to identify how baselines and targets will be set for a new CPI, using an analytically rigorous and transparent approach. Historical data could provide an input to baseline setting, and current data will help measure compliance. Targets may be set in a top-down or bottom-up approach. While the sector can be identified by making high-level assessment of mitigation potential, the facility or institutional-level targets may need to be decided in a bottom-up manner, depending on the CPI chosen.
- **Robust data management and registry:** As discussed in BB3, data management and registry forms an important aspect of any CPI. While data is important for setting targets and baseline determination, regular flow of data and data management will also be required to assess and ensure compliance. Compliance may be monitored easily through the registry. The registry design could also facilitate transactions of tradable units.
- **Trading and offsets:** The design of the CPI should identify what units would be used and how these would be traded. To explore linkages with the SLCCS or other CPIs as offsets, a common unit would be needed. A common registry, as discussed in BB3, would facilitate this.
- **Time-period of each cycle:** While each compliance cycle in a CPI could be short-term in line with NDC cycles and so that future cycles can be improved, the overall vision of the scheme should be long-term, supporting national policy objectives and providing stability by reducing risk and uncertainty.

- **Price predictability and market stability:** For a CPI to be successful, it should be designed to provide long-term price signals and reduce uncertainty among market participants. A long-term approach would provide confidence to market participants. At the same time, there should be room for flexibility so that the CPI can be adapted quickly to any external/internal changes that may arise.
- **Regulatory and legislative changes:** to ensure compliance, it is important to embed the CPI in the sectoral regulatory and legislative framework. If required, new directives and legislation should be identified during the design phase that could ensure that the regulator has full oversight of the CPI and can exert penalties in case of non-compliance.
- **Engage stakeholders and build capacities:** Stakeholders must be involved during the design process to obtain feedback and buy-in. Once designed, the scheme and its various provisions should be made visible through regular outreach and dissemination. This outreach will facilitate compliance, by soliciting stakeholder inputs on potential improvements. Continuous stakeholder interaction and engagement is therefore essential.
- **Pilot, evaluate and improve:** Before implementing the scheme at its full-scale, it is important to pilot it at a small scale. This should be part of the roadmap and is analogous to the piloting of the enhanced SLCCS supported by BB4 (see section 4.3).

4.4.3 Options for linking the new CPI with the SLCCS

As discussed earlier, one important source of demand for the SLCCS would be a domestic compliance market – in other words, entities subject to, for example, a carbon tax, ETS, or other similar CPIs who could use SLCCS credits to offset part of their obligations. As part of the design and piloting of the new CPI, the links with the SLCCS would be explored under this component of BB4. Some important issues that would be considered include:

- **Common units:** the new CPI and the SLCCS would have to use common metrics
- **Common/linked registry:** the new CPI and the SLCCS would need to be linked through the various national registries, and those registries would need to support transactions as well as basic data management.
- **Rules on use of offsets:** the new CPI would need rules on when, how and to what extent the covered entities could use offsets from the SLCCS to meet their compliance obligations
- **Clear rules on source of offsets:** to avoid double counting rules should be laid out on sectors, installations and GHG gases which are eligible under the SLCCS

4.5 Activities, deliverables and proposed budget

4.5.1 Objectives

The objectives of BB4 are to:

- Design and pilot an enhanced SLCCS, building on the analysis of mitigation potential in BB2
- Develop a roadmap for a new CPI, which would complement the SLCCS and contribute to achieving Sri Lanka's NDC goals

4.5.2 Outputs, Activities and Deliverables

Output	Rationale	Activities/ Description	Deliverables	Responsibility
Output 4.1 SLCCS strategy & design study	Need to understand the requirements for different demand and supply options, and their role in supporting SLCCS goals.	4.1.1 Enhancing demand for SLCCS 4.1.2 Enhancing supply for SLCCS	SLCCS Strategy & Design Study including: recommendation on international and/or domestic demand options; strategy for private sector engagement and promotion of SLCCS; Institutional and legal framework; identification of specific sub-sectoral supply options; proposed simplified methodologies and MRV for specific priority supply options; proposed streamlined project cycle; approach to linking SLCCS registry to national registry; and plan for capacity building	CCS
Output 4.2 Designing the institutional, legal and technical framework	Enabling environment should match the objectives, and the requirement of the demand and supply sources; enhancing the SLCCS will require a dedicated capacity building and stakeholder consultations	4.2.1 Designing institutional Structures 4.2.2 Developing simplified rules, procedures and methodological approaches		
Output 4.3 Piloting the enhanced SLCCS	Piloting will test the enabling environment and help develop a new pipeline of projects for the SLCCS, and allow for corrections before a full launch.	4.3.1 Pilot the enhanced SLCCS	Completed institutional and legal framework (i.e. necessary structures and regulations are in place); Piloting of enhanced SLCCS (i.e. development of project pipeline); Impact assessment report on pilot implementation	CCS
Output 4.4 Developing a roadmap for a new CPI	Government needs to understand feasibility of various design alternatives for the selected CPI, and also how a new instrument could create demand for the SLCCS	4.4.1 Designing a new CPI and linking to the SLCCS	Technical and financial feasibility study on new CPI Roadmap for piloting and implementation of new CP	CCS

4.5.3 Timeline

Output	2018			2019				2020	
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Output 4.1 SLCCS strategy and design study									
Output 4.2 Designing the institutional, legal and technical framework									
Output 4.3 Piloting the enhanced SLCCS									
Output 4.4 Developing a roadmap for a new CPI									

4.5.4 Budget

Output	Estimated support from PMR (US\$)			Funding Source (US\$)		
	Year 1 (2018)	Year 2 (2019)	Year 3 (2020)	PMR	Government	Total
Output 4.1 SLCCS strategy and design study	60,000	150,000	0	210,000	21,000	231,000
4.1.1 Assessing and enhancing demand for SLCCS	30,000	70,000	0	100,000	10,000	110,000
4.1.2 Assessing options for supply for SLCCS	30,000	80,000	0	110,000	11,000	121,000
Output 4.2 Designing the institutional, legal and methodological framework	75,000	260,000	0	335,000	33,500	368,500
4.2.1 Designing institutions and capacity building	32,500	117,500	0	150,000	15,000	165,000
4.2.2 Developing simplified rules, procedures and methodological approaches	42,500	142,500	0	185,000	18,500	203,500
Output 4.3 Piloting the enhanced SLCCS	0	115,000	190,000	305,000	30,500	335,500
Output 4.4 Developing a roadmap for a new CPI	0	130,000	130,000	260,000	26,000	286,000
Total	135,000	655,000	320,000	1,110,000	111,000	1,221,000

5. Building Block 5. Organization, Communication, Consultation and Capacity Building

This section outlines the proposed organizational framework for coordinating PMR grant-funded activities. In doing so, BB5 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 BBs. This section also identifies any cross-cutting activities for communication, consultation and capacity building, which could be undertaken during the MRP implementation phase.

5.1 Organization for Grant Management Activities

The **CCS** within the MMDE will be responsible for the overall coordination of the MRP and implementation of its project activities. Upon the receipt of the PMR grant, Sri Lanka will establish a **Project Management Unit (PMU)**, which will be responsible for the overall guidance of the project management, including adherence to annual work plans, achievement of planned results as outlined in the MRP, and the use of PMR grants through effective management and review mechanisms. The PMU will also ensure coordination with various ministries and agencies and provide guidance to project activities, review reports and manage the administrative arrangements required under the Government of Sri Lanka.

The PMU shall be headed by the **National Project Coordinator (NPC)** who will be responsible for implementing the day-to-day activities, and cross-cutting communication, consultation and capacity building activities proposed in section 2 of BB5 below. The NPC will mobilize the project team for the full project tenure to ensure that the availability of experts and consultants until the project completion. The NPC will be supported by project management teams in three key areas: (a) Legal, Institutional and Regulatory Frameworks; (b) Administrative and Finance; and (c) Knowledge Management.

An inter-ministerial **Project Steering Committee (PSC)** will be established to ensure coordination and proactive engagement across several ministries and departments. The PSC will be responsible for making management decisions for the project, particularly when guidance is required by the PMU. It will also oversee the progress of the implementation of the MRP and monitor project deliverables; coordinate with relevant Ministers to address decisions required at a higher political level; and arbitrate any potential conflicts within the project.

Members of the PSC will include officials from the following ministries, among others:

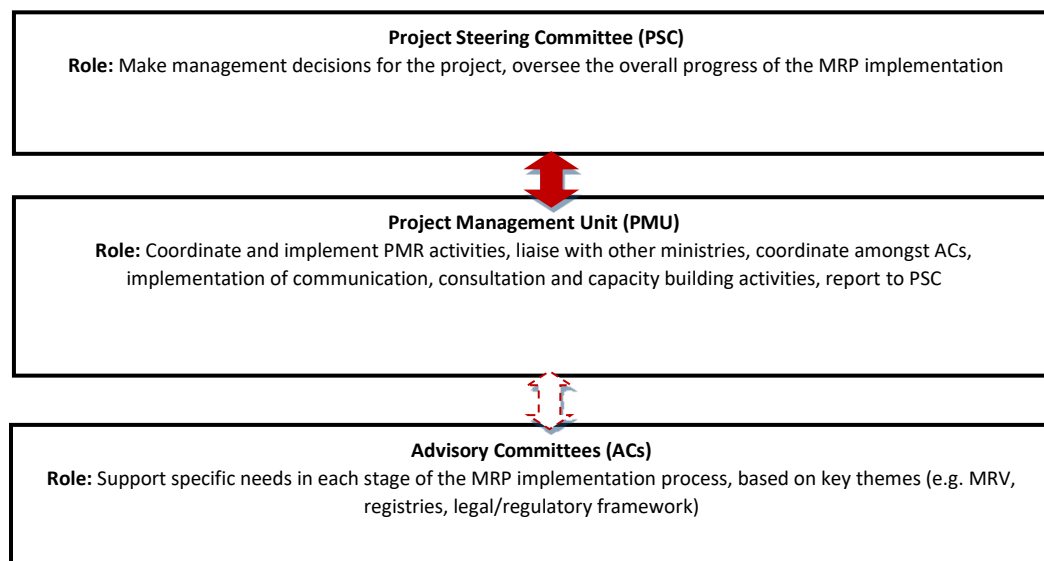
- MMDE
- Ministry of Power and Renewable Energy
- Ministry of Finance
- Ministry of Higher Education and Highways
- Ministry of Ports and Aviation
- Ministry of the Provincial Councils and Local Government
- Ministry of Ports and Shipping
- Ministry of Transport
- Ministry of Industry and Commerce
- Ministry of National Policies and Economic Affairs (Department of National Planning)

Furthermore, the PMU will establish **Advisory Committees (ACs)** to provide technical advice and support the PMU in specific project deliverables. Members of the ACs will be jointly appointed by the PMU and PSC. Thematic ACs could be inter-ministerial when, for example, the topic concerns particular design elements of the proposed CPI(s), registry of MRV systems. On the other hand, these ACs could include multiple stakeholder groups in the Government, private sector, civil society and international climate community when, for example, discussing sector-specific participation and requirement issues. Thematic ACs could be formed following initial consultations with stakeholders from key sectors, as tentatively listed in Table 25 below.

Table 25 Potential AC stakeholder groups from the energy, transport, industry and waste sectors

Energy Sector AC	Transport Sector AC	Industry Sector AC	Waste Sector AC
<ul style="list-style-type: none"> Ministry of Power & Renewable Energy Ministry of Petroleum Resources Development Ministry of Finance Ministry of Policy Planning and Economic Development SEA CEB CCS Department of Irrigation Local Authorities Petroleum Resources Development Secretariat Urban Development Authority 	<ul style="list-style-type: none"> Ministry of Transport & Civil Aviation Ministry of Higher Education and Highways Ministry of Mahaweli Development & Environment Ministry of Megapolis and Western Development CCS CEB Central Environment Authority Civil Aviation Authority Department of Motor Traffic LECO Local Authorities National Transport Commission Road Development Authority SEA Sri Lanka Port Authority 	<ul style="list-style-type: none"> Ministry of Industry and Commerce Board of Investment Sri Lanka CCS Central Environment Authority Ceylon Chamber of Commerce Chief Secretaries (all provinces) Environmental Planning and Economics Division Export Development Board Federation of Chambers of Commerce and Industry Industrial Development Board Industrial Technology Institute National Chamber of Commerce National Cleaner Production Centre Sri Lanka Institute of Textile and Apparel Treasury 	<ul style="list-style-type: none"> Ministry of Provincial Council and Local Government Ministry of Vocational Education Ministry of Agriculture Ministry of Health, Nutrition and Indigenous Medicine Ministry of Mahaweli Development & Environment CCS Central Environment Authority Department of Local Government Industrial Technology Institute Local Authorities Provincial Councils SEA Sri Lanka Institute Local Government Sri Lanka Land Reclamation and Development Corporation Urban Development Authority

Table 26. Organizational setup for the MRP implementation phase



5.2 Consultation and communication

The following section outlines a preliminary plan for the MRP's cross-cutting communication, stakeholder consultation and capacity building activities, which will be undertaken and coordinated by the PMU during the implementation phase.

5.2.1 Stakeholder consultation

The purpose of the consultations is to contextualize the proposed CPI(s), the national MRV framework and registry system within Sri Lanka'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. Table 27 provides a list of broad topics that could be covered in the stakeholder consultations. The specific topics for stakeholder consultations, however, would be informed by the outcomes of BB2, BB3 and BB4.

Table 27 Tentative list of key topics for the stakeholder consultation

Issue	Scope	Stakeholder groups
SLCCS	<ul style="list-style-type: none"> • Scope/coverage boundary • Legal, institutional and regulatory framework • Operational infrastructure • Approach for crediting • MRV and project cycles • Link with national registry • Options for demand-side and supply-side stimulus 	<ul style="list-style-type: none"> • PSC • CCS • SLCF • ACs • Business associations • Financial institutions • CSR-orientated companies • International agencies • Academia and civil society • Representatives from voluntary standards (e.g., VCS and GS)

New CPI	<ul style="list-style-type: none"> • Suitability of different types of CPIs such as carbon tax or ETS to address policy gaps • Scope/coverage boundary • Legal, institutional and regulatory framework • Setting baseline and targets • Operational infrastructure • MRV • Linking with national registry • Link with SLCCS • Price predictability and market stability 	<ul style="list-style-type: none"> • PSC • CCS • ACs
National MRV system	<ul style="list-style-type: none"> • MRV methodologies • Operational/human resource requirements for monitoring and reporting • Legal, institutional and regulatory framework • Capacity building activities 	<ul style="list-style-type: none"> • PSC • CCS • SLCF • ACs • Designated operational entities and third party verifiers • Academia and civil society • Representatives from voluntary standards (e.g., VCS and GS) • International agencies
Registry	<ul style="list-style-type: none"> • Registry and tracking tool • Operational/human resource requirements for monitoring and reporting • Legal, institutional and regulatory framework • Capacity building activities 	<ul style="list-style-type: none"> • PSC • CCS • SLCF • ACs for key sectors • Academia and civil society • Representatives from voluntary standards (e.g., VCS and GS) • International agencies

The following sub-activities have been proposed to ensure that all key stakeholder groups are adequately consulted on the issues identified in table 5.2.

5.2.1.1 Kick-off workshop

The multi-stakeholder workshop would be held at the beginning of the PMR implementation in order to inform relevant stakeholders of the proposed roadmap, objectives and outcomes of the activities under the MRP.

5.2.1.2 Follow-up annual workshops

These multi-stakeholder workshops could be held on a yearly basis, and could be used as a means to monitor the progress of the PMR implementation and receive feedback from the broader set of stakeholders that are beyond the group of main governmental agencies. These workshops could also be used to develop specific annual workplans for all components of the implementation.

5.2.1.3 *Topic-specific workshops*

The timeline, scope and objectives of these additional workshops would be defined in the annual follow-up workshops. The main focus of these workshops is to provide a deep-dive into one specific implementation aspect of the MRP, and the agenda will depend on the concerned Thematic AC's understanding of the topic, as well as the implementation progress and the needs that are evaluated during the yearly meeting.

5.2.1.4 *Progress reports and quarterly workshops*

The CCS, PMU, PSC and other main agencies may have regular quarterly meetings to discuss the implementation progress. Progress reports involving a thorough monitoring and evaluation of deliverables could be conducted on a quarterly basis, and presented in these workshops to ensure that outputs are useful and implemented in a timely manner. The reports should include explanation on the reasons of any delays and expected timelines for the completion of the task. Furthermore, the Progress Report should also identify potential risks and barriers faced during the implementation phase (e.g. lack of buy-in from relevant stakeholders), and identify suitable risk-mitigation strategies.

These reports would ensure regular oversight by the PSC, and allow early course correction. Regular interaction with the PSC would also ensure that the deliverables are in the right strategic direction based on Sri Lanka's development and mitigation priorities.

5.2.1.5 *Stakeholder Interviews*

Direct interviews with key stakeholders may be held for a more detailed discussion on key stakeholders' perception of the project. Through these discussions, the PMU may identify potential barriers of the project, and alternatives to overcome these barriers.

5.2.1.6 *External outreach*

The PMU may also participate in international conferences such as the Innovate4Climate to interact and share lessons learned with other Governments, as well as international businesses and expert groups.

5.2.2 *General outreach and dissemination*

The purpose of the general outreach activities is to raise awareness among ministries, private sector, civil society group, academia as well as the general public about the key benefits, objectives and requirements of the proposed CPI(s), MRV framework and registry system. The following sub-activities have been proposed to support this goal.

5.2.2.1 *Wide consultation process*

This will involve preparing publications, such as white papers, policy briefs, press release or articles as the basis of a wide consultation process of the project outputs. The publications would highlight the various aspects related to the development process of the MRP activities, the economic implications, and technical requirements of the CPI(s) etc. These publications could then be disseminated through national or regional printed or electronic media.

5.2.2.2 *Educational workshops and seminars*

A series of workshops and seminars for schools, universities and scientific communities can be conducted in order to increase their awareness and knowledge on climate change, mitigation policies and measures, MRV/registry systems, SLCCS and other CPI(s).

5.2.2.3 Website

Sri Lanka's PMR webpage could act as a one-stop access for information regarding Sri Lanka's PMR participation and activities. This website could host all important information such as documents produced, ToRs, contact information, recent events, and proceedings of meetings held as part of the PMR activities. This website could also provide links to the other deliverables such as the registry. The website would require constant updating and technical support. Therefore, suitable staff will be recruited to maintain the web content.

5.3 Capacity building and technical assistance activities

Activities for capacity building can be organized in two levels. One level involves capacity building activities across the board on topics related to the operation and participation opportunities within the proposed CPI(s), national MRV framework and registry system. The capacity building activities would be informed by the needs assessment and outputs of BB2, BB3 and BB4. This level of capacity building can be common to different public sector and non-state groups, generating economies of scale in resources and time management.

The second level aims to address specialized needs. For example, project developers and market participants would require new skills to adequately participate in the proposed market mechanisms. These stakeholders would have to be trained to understand and participate in the SLCCS and/or other CPI(s).

Furthermore, the executing body, SLCF, may have to receive technical assistance on a number of topics/packages in order to operate and manage the proposed CPI(s). In addition, the capacity building program may be complemented with a Knowledge Management Strategy in order to ensure that the know-how and skills developed are not lost during staff rotation.

Finally, since market readiness may vary across different sectors, sector-specific capacity building activities may also help identify possible private sector participants to engage in the CPI(s), and create an enabling environment for the market operation at the sector-level. Other sector-specific capacity building activities include the development and training to generate data and MRV system, both of which are instrumental to the market operation.

Table 28. Tentative list of capacity building/technical assistance programs

Topic	Audience	Output	Objective
General capacity building			
Introducing the CPI(s)	Multi-stakeholder	Training workshops, guidance documents, how-to videos, e-learning modules	Introducing the operation and key elements of the marker-based instrument(s)
Introducing the national MRV system	Multi-stakeholder	Training workshops, guidance documents, how-to videos, e-learning modules	Introducing the operation and key elements of the MRV system
Introducing the national registry system	Multi-stakeholder	Training workshops, guidance documents, how-to videos, e-learning modules	Introducing the operation and key elements of the registry system

<i>Specialized capacity building</i>			
Participation opportunities and requirements for SLCCS	AC members, project developers and market participants	Training workshop, follow-up meetings, guidance documents	Participation opportunities and technical requirements for the SLCCS
SLCCS policy-related functions	AC members, PSC, SLCCS administrator	Training workshop, follow-up meetings, guidance documents	Set the principle and strategy for the crediting scheme, coordinate and interact with international financiers and donors
Baseline setting, GHG ER estimation, SD valuation and MRV principles	SLCCS administrator, Potential project developers	Training workshop, follow-up meetings, guidance documents	Introduce methods of baseline and goal setting; estimation of ER; quantification and identification of SD impacts and MRV elements
SLCCS operation and management	SLCCS Administrator	Training workshop, follow-up meetings, guidance documents	Train SLCCF staff and develop internal guiding documents to operate the SLCCS
SLCCS verification: training of Trainers	SLCCS Administrator, accredited verifiers	Training workshop, follow-up meetings, guidance documents	Introduce entities accredited under other international schemes to SLCCS-specific requirements
SLCCS IT System Operation (including knowledge management)	SLCCS Administrator	Training workshop, webinars, guidance documents	Train staff to use IT-based solutions to manage, record and track progress of the SLCCS. This program should include knowledge management provisions to avoid losing the acquired capacity.
Sector-specific MRV requirements	AC members, project developers, and other relevant stakeholders in key sectors	Training workshop, follow-up meetings, guidance documents	Sector-specific technical requirements for the national MRV system
Sector-specific registry requirements	AC members, project developers and other relevant stakeholders in key sectors	Training workshop, follow-up meetings, guidance documents	Sector-specific technical requirements for the national registry system

5.4 Monitoring, evaluation and risk mitigation strategies

There may be potential risks and barriers to implementing activities under the MRP. For example, there is a risk that the proposed enhanced SLCCS and new CPI could face low levels of political support and commercial interest. To reduce these risks, there is a need to develop a comprehensive **communication and capacity building strategy** to ensure that all relevant ministries and stakeholder groups are involved at key stages of the decision-making process; have the required capacity to participate in the proposed activities; and ensure political buy-in on all activities under the MRP. This shall involve developing comprehensive and coordinated work plan(s) for various BBs with clear milestones and indicators for (a)

engaging and consulting with relevant stakeholders; (b) conducting general outreach and (c) implementing capacity building and technical assistance activities.

Another key risk is potential time constraint to finalize activities under the MRP, given the closure of PMR in 2020. In response, progress reports with appropriate monitoring and evaluation methodologies would be required to ensure compliance with the proposed timeline, deliverables and outputs. The reports should identify appropriate strategies to mitigate the risk of lagging progress as well as other potential barriers to the PMR-supported activities. As mentioned in section 5.2.1.4, these progress reports could form the basis of discussion for quarterly meetings with CCS, PMU and PSC.

5.5 Activities, deliverables and proposed budget

5.5.1 Objectives

The objectives of BB5 are to:

- Plan for the organization and coordination of the PMR grant funded activities and clarify related decision-making process
- Identify cross-cutting activities for communication, consultation and capacity building to support the country's carbon pricing readiness

5.5.2 Deliverables and timeline

Output	Rationale	Description	Deliverables	Responsibility
Output 5.1 Project Management Unit	To assist in the management of the PMR grant	<ul style="list-style-type: none"> Key governance activities which would include preparing ToRs, shortlisting consultants, monitoring sub-contracted activities etc. Key relationship management activities which would include coordinating regular meetings with inter-ministerial committee etc. Key liaising role which would include updating relevant line ministries, relevant committee etc. Key capacity building, outreach and dissemination activities (see output 5.2 to 5.5) 	<ul style="list-style-type: none"> Meetings with board and steering committee, consultants and other key stakeholders General outreach activities (e.g., updating website, preparing policy briefs) 	PMU
Output 5.2 Communication and capacity building strategy	To develop a comprehensive strategies and work plans for general outreach, stakeholder consultation and capacity building	<ul style="list-style-type: none"> Develop comprehensive and coordinated work plan(s) 	<ul style="list-style-type: none"> Work plan(s) 	PMU
Output 5.3 Stakeholder consultations	To ensure that all stakeholders, including the PSC and AC(s), are informed about the decision process, and ensure buy-in on all activities under the MRP	<ul style="list-style-type: none"> Develop communication documents for stakeholder consultations 	<ul style="list-style-type: none"> Kick-off workshop Follow-up annual workshops Topic-specific workshops 	PMU

Output	Rationale	Description	Deliverables	Responsibility
		<ul style="list-style-type: none"> Organize webinars, bilateral meetings and/or workshops with key stakeholders 	<ul style="list-style-type: none"> Progress reports and quarterly workshops Stakeholder interviews External outreach Final workshop 	
Output 5.4 General outreach	To raise general awareness about the benefits, objectives and requirements of the proposed CPI(s), MRV framework and registry system	<ul style="list-style-type: none"> Coordinate and conduct national outreach and dissemination activities with regard to the CPI and PMR related activities Large scale national events will also be important and used as a key outreach strategy Update website to provide key updates on PMR and CPI related activities 	<ul style="list-style-type: none"> Publications (white papers, policy briefs, press release or articles) Educational workshops and seminars Website 	PMU
Output 5.5 Capacity building and technical assistance	To build stakeholders' capacity to operate and participate in the CPI(s), registry system and MRV framework.	<ul style="list-style-type: none"> Conduct state and sector level capacity building activities 	<ul style="list-style-type: none"> Training workshops/webinars Guidance documents How-to video(s) E-learning modules 	PMU
Output 5.6 Monitoring, evaluation and risk management	To monitor and track progress, and identify solutions for potential risks	<ul style="list-style-type: none"> Produce reports to track progress based on the proposed timeline, deliverables and outputs Identify risk-mitigation strategies as needed 	<ul style="list-style-type: none"> M&E report with action points 	PMU

Output	2018			2019			2020		
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Output 5.1 Project Management Unit									
Output 5.2 Communication and capacity building strategy									
Output 5.3 Stakeholder consultations									
Output 5.4 General outreach									
Output 5.5 Capacity building and technical assistance									
Output 5.6 Monitoring, evaluation and risk management									

5.5.3 Budget

	Estimated support from PMR (US\$)			Funding Source (US\$)		
Output	Year 1 (2018)	Year 2 (2019)	Year 3 (2020)	PMR	Government	Total
Output 5.1 Project Management Unit	63,000	84,000	63,000	210,000	21,000	231,000
Output 5.2 Communication and capacity building strategy	5,000	7,000	5,000	17,000	1,700	18,700
Output 5.3 Stakeholder consultations	10,000	10,000	10,000	30,000	3,000	33,000
Output 5.4 General outreach	10,000	10,000	10,000	30,000	3,000	33,000
Output 5.5 Capacity building and technical assistance	10,000	10,000	10,000	30,000	3,000	33,000
Output 5.6 Monitoring, evaluation and risk management	11,000	11,000	11,000	33,000	3,300	36,300
Total	109,000	132,000	109,000	350,000	35,000	385,000

6. Building Block 6. Summary of Outputs, Timeline and Budget

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

Table 29. Summary of planned outputs

Output	Description	2018				2019				2020			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
2.1	Assessment of mitigation potential in different sectors and identification of suitable CPI(s) for potential sectors												
2.2	Roadmap for designing and implementing an optimal policy package												
3.1	Needs assessment												
3.2	MRV and registry design												
3.3	Pilot the system												
4.1	SLCCS Strategy & Design Study												
4.2	Designing the institutional, legal and technical framework												
4.3	Piloting the enhanced SLCCS												
4.4	Developing a roadmap for a new CPI												
5.1	Project Management Unit												
5.2	Communication & capacity building strategy												
5.3	Stakeholder consultations												
5.4	General outreach												
5.5	Capacity building												
5.6	Monitoring and evaluation												

Table 30. Summary of budget

Building Block	Estimated support from PMR (US\$)			Funding source		
	Year 1	Year 2	Year 3	PMR	Govt	Total
BB2	363,500	201,500	0	565,000	56,500	621,500
BB3	335,000	367,500	272,500	975,000	97,500	1,072,500
BB4	135,000	655,000	320,000	1,110,000	111,000	1,221,000
BB5	109,000	132,000	109,000	350,000	35,000	385,000
Total	942,500	1,356,000	701,500	3,000,000	300,000	3,300,000

Annexure 1: Potential policy options in the energy, industry, transport and waste sectors

Type	Energy	Industry	Transportation	Waste
Carbon pricing	Carbon tax Cap-and-trade Crediting Suppression of fossil fuel subsidies	Carbon tax Cap-and-trade	Carbon tax added to tax duties Suppression of tax exemption	Crediting
Non-carbon pricing	Fossil fuel import quota/tax Tax credit Direct subsidies Competitive bidding/auction to NCRE investment/production Tradable energy efficiency (white) certificates Tradable renewable energy (green) certificates Demand-side management	Tax relief on energy-efficiency measures Tradable white certificates Tradable green certificates	Direct subsidies for clean cars Tax credit for clean cars	Direct subsidies Tax credit for cleaner production
Command-and-control	Emissions/efficiency performance standards Technology standards Obligations of green/clean electricity on retailers	Emission performance standards Requirements for operation licensing	Performance standards and fuel consumption Prohibition of old and emitting vehicles Biofuel blends mandate Phase out of poor performing vehicles	Production and recycling standards Bans on specific waste products Requirements for operation licensing Closure of dumpsites
Technology development support	Public support on RD&D Rating and labeling programs	Public support on R&D Production certification and labelling	Public support on RD&D	Public support on R&D Production certification and labelling
Financial instrument	Soft loans Risk-sharing arrangements (e.g. public-private partnership)	Soft loans Risk-sharing arrangements	Soft loans Risk-sharing arrangements	Soft loans Risk-sharing arrangements
Direct public investment	Upgrading of national grid to accommodate NCRE, such as solar and wind power	Energy efficiency investment	Electrify railways in the double track segments Develop park-and-ride facilities near stations Invest in public transport, walking and cycling infrastructure Modify railways, airports, ports	Direct investment in waste generation and collection, material recycling centers etc

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