



Low Emission Capacity Building (LECB) Programme

FINAL REPORT

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Acronyms

BAPPENAS	Ministry of National Development Planning, Indonesia
BAU	Business as Usual
BMU	German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety
BUR	Biennial Update Report
CDM	Clean Development Mechanism
CHP	Combined Heat and Power
COP	Conference of the Parties
CPEIR	Climate Public Expenditure and Institutional Review
DRC	Democratic Republic of Congo
EC	European Commission
EIMS	Environment Information Management System (Bhutan)
GEF	Global Environment Facility
GGGI	Global Green Growth Institute
GHG	Greenhouse Gas
GSU	Global Support Unit
INDC	Intended Nationally Determined Contributions
IPCC	Inter-Governmental Panel on Climate Change
ISWA	International Solid Waste Association
LAC	Latin America and the Caribbean
LDC	Least Developed Country
LEAP	Long-range Energy Alternatives Planning
LECB	Low Emission Capacity Building
LEDS	Low Emission Development Strategy
M&E	Monitoring and Evaluation
MRV	Measurement, Reporting and Verification
NAMA	Nationally Appropriate Mitigation Action
NCCP	National Climate Change Plans
NC	National Communication
NDC	Nationally Determined Contributions
NFI	National Forest Inventory
NIM	National Implementation Modality, UNDP
NINO	NAMA Information Note
OECD/DAC	Organisation for Economic Co-operation and Development, Development Co-operation Directorate
REDD	Reduced Emissions from deforestation and land degradation
ROM	Results-Oriented Monitoring
SEMARNAT	Ministry of Environment and Natural Resources, Mexico
SIDS	Small Island Development States
TNC	Third National Communication
TWG	Thematic Working Groups
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
USA	United States of America
US EPA	United States Environmental Protection Agency
WB	World Bank

1. Executive Summary of main achievements

The Low Emission Capacity Building (LECB) Programme was a joint initiative between the European Commission (EC), governments of Germany and Australia, and the United Nations Development Programme (UNDP). It was implemented by UNDP. The overarching objective of the LECB Programme was to create awareness and build capacity in the public and private sectors in developing countries on how to pursue a low carbon pathway as basis for economic development. The LECB Programme was launched in January 2011 (EU (co)funded Action start date: 16 December 2010) and finalised by the end of 2018 after being extended two years.

The LECB Programme had a total budget of approximately 31,980,000 Euros from three funding partners: the European Commission (18 million Euros), the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMU) (10 million Euros), and the Government of Australia (5 million Australian Dollars).

LECB was delivered through three components:

- 1) The first component focused on Public Sector Capacity Building on measurement, reporting, and verification (MRV); Nationally Appropriate Mitigation Actions (NAMAs); and Low Emission Development Strategies (LEDS). It included three modules on strengthening greenhouse gas (GHG) inventory systems; capacity building and elaboration of LEDS and NAMAs; and setting up corresponding MRV systems.
- 2) Component 2, Private Sector Capacity Building for Mitigation Actions, was directed towards the private sector and comprised two modules with the following key outputs: *Mitigation actions in selected private (industry) sectors have been established, and MRV systems to support and monitor mitigation actions created.*
- 3) The third component, Public Sector Capacity Building for Intended Nationally Determined Contributions (INDCs), focused on support for the elaboration of INDCs.

Initially the Programme included 15 countries: Argentina, Chile, China, Colombia, Democratic Republic of Congo (DRC), Ecuador, Egypt, Indonesia, Kenya, Mexico, Morocco, Peru, the Philippines, Uganda, Zambia. South Africa and Brazil were initially selected but did not join the Programme, so they were substituted by Indonesia and Argentina, which were selected because they also had a relatively high level of emissions in industrial sectors. The Programme was later expanded to 25 countries thanks to additional funding contributions. The additional ten countries were Bhutan, Costa Rica, Ghana, Lebanon, Malaysia, Moldova, Tanzania, Thailand, Trinidad and Tobago, and Vietnam. The beneficiary countries were selected upon an analysis done by UNDP based on priorities of the donors, a suitable geographic mix and willingness, a reasonable level of capacity to get started, and interest/demand of the countries to participate in the Programme.

The LECB Programme fulfilled its overall objective and increased the capacity in public and private sector to address mitigation challenges in general and to strengthen GHG inventories; develop LEDS and NAMAs; and develop systems to measure, report and verify climate data. Through its **flexible and country-led approach** it succeeded in many countries to **establish real buy-in to the need for GHG emission reductions and apply tools for low emission development**. Although certain standard approaches and actions were introduced, the flexible approach also gave space for the achievement of **unexpected national outcomes**, which were in line with the countries' current policies and priorities. This increased the support to the LECB Programme and the active participation by public and private sector institutions. Therefore, the LECB Programme

contributed to laying the ground work for the elaboration of the INDCs and later the awareness raising and implementation planning for Nationally Determined Contributions (NDCs).

The LECB Programme was expanded several times with increasing budgets and task and the management structure permitted adjustments to the increasing challenges in a way that sustained complex and customised processes in 38 countries so that the national projects with its activities were implemented. These results were achieved through a wide range of capacity building actions, elaboration of knowledge products and varied technical support, which was to a large extent customised to specific country demands.

2. Context and brief description of the LECB Programme

The LECB Programme was a global programme spanning five regions and consisting of national level projects and a Global Support Unit (GSU) based at UNDP headquarters. The LECB GSU was responsible for overall management of the LECB Programme, liaising with donors, technical support and guidance for the LECB national projects, knowledge management and knowledge sharing, and peer-to-peer exchange. The UNDP country offices were responsible for the administration and implementation oversight of the national LECB projects with guidance and backstopping provided by the GSU.

The overarching aim of the LECB Programme was to create awareness and build capacity in the public and private sectors in developing countries including Least Developed Countries (LDC) and Small Island Development States (SIDS) on how to pursue a low carbon pathway as a basis for economic development.

The LECB Programme had three overall objectives:

1. *To build public sector capacity on MRV, NAMAs and LEDS*

This component strengthened the capacity of developing countries to monitor, report and verify greenhouse gas emissions and mobilised/proposed/earmarked resources for climate change mitigation. It also supported the formulation of NAMAs and LEDS in the context of national development.

2. *To build private sector (industry) capacity for mitigation actions*

This involved supporting the uptake of mitigation actions by selected industrial sectors, with participation of the private sector, as appropriate, into countries' mitigation roadmaps. Such support took into account national priorities and circumstances.

3. *To build public sector capacity for INDCs*

This component supported participating countries with the development and submission of INDCs in the lead up to the historic Paris Agreement. It also helped countries to undertake a substantive review of information in order to make critical decisions about the scope/content of their I/NDCs in a way that maximizes both climate change and development benefits, and fully embeds the INDC in the national development process.

The LECB Programme was designed in 2010 and launched in January 2011 (EU (co) funded Action start date: 16 December 2010). The original end date of the programme was 15 December 2014, but this was extended to 31 December 2018 to allow inclusion of support for formulation of Nationally Determined Contributions and to allow countries to finish their original project activities.

The LECB Programme had a total budget of 31,980,000 Euros from three funding partners: The European Commission (18 million Euros), the German Federal Ministry for the Environment, Nature Conservation, and

Nuclear Safety (BMU) (10 million Euros), and the Government of Australia (5 million Australian Dollars). For more detail see chapter 6 on financial execution.

The LECB Programme was designed and launched in a pre-Paris Agreement context. At the time the developed countries in the United Nations Framework Convention on Climate Change's (UNFCCC) Annex 1 (Annex 1 Parties) – the historically larger emitters of GHG – had the legal responsibility for reducing GHG emissions as stipulated in the Kyoto Protocol. However, without the participation of USA, the Kyoto Protocol had shown to be less efficient in providing the necessary reduction “*to achieve ... stabilisation of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system*”.¹ In the same period, a number of developing countries that were not included in Annex I-DoA (Non-Annex I Parties to the UNFCCC) – and with no legal obligations to reduce emissions – were drastically increasing their GHG emissions linked to their economic development, such as China, India, Brazil, Mexico, Indonesia, and South Africa. There was also an increasing focus globally on GHG emissions from non-petrol sources like agriculture and forestry e.g. the REDD (Reduced Emissions from deforestation and land degradation) Programme and later REDD+ the focus on emissions from forestry, agriculture and changes in land use, which are quite high in developing countries.

It was in this context, that the LECB Programme was designed to build capacity and create awareness in governments and the private sector in selected developing countries about the possibilities of voluntarily contributing to reducing GHG emissions, pursuing low carbon pathways, and thereby avoiding future GHG-intensive economic development.

The LECB Programme supported the application of a set of policies and actions – namely LEDS and NAMAs, which are voluntary instruments. At the same time, LECB strengthened capacities for elaborating and/or strengthening national GHG inventory systems and MRV systems. This capacity building assisted developing countries in elaborating National Communications (NC) on GHG emissions (committed to under the UNFCCC) and Biannual Update Reports (BUR), which developing countries were obliged to submit for the first time in December 2014.

In order for the LECB to establish productive working relationships with the public institutions and the private sector, a collaborative and flexible approach was applied by UNDP as the implementing agency. It promoted as much as possible country-driven decision-making processes and implementation of actions allowing the development of national outcomes that were not initially expected in the Programme design as long as they were within the overall mitigation objective.

LECB was delivered through three components.

- 1) The first component focused on Public Sector Capacity Building on MRV, NAMAs and LEDS. It included three modules on strengthening GHG inventories systems; capacity building and elaboration of LEDS and NAMAs; and setting up corresponding MRV systems.
- 2) Component 2, Private Sector Capacity Building for Mitigation Actions, was directed towards the private sector and comprised two modules with the following key outputs: *Mitigation actions in selected private (industry) sectors have been established, and MRV system to support and monitor mitigation actions created.*
- 3) The third component, Public Sector Capacity Building for INDCs, supported the elaboration of INDCs.

¹ Article 2 of the UNFCCC

In early 2015, at the request of Programme donors, the LECB Programme was adapted to include support to 13 LECB countries and 13 additional countries to prepare INDCs ahead of the UNFCCC Conference of the Parties (COP) 21 in Paris in December 2015. Three countries were funded by GIZ while the rest receives funding by the EU. Already during the COP19 in Warsaw in 2013, countries had been requested to elaborate an INDC as a response to the Lima Call for Action that emerged at the COP 20 in Lima in December 2014. Only very few countries and no developing country, except Gabon, had submitted their INDC in early 2015, so there was an urgent need for particular attention to support the elaboration of INDCs of the developing countries within the overall national objectives of economic development and poverty reduction.²

Table 1 provides an overview of the countries receiving support for five main actions under the three components, the sectors identified for mitigation action, as well as the total funding for each national project. Overall, the Programme has supported countries on the following outputs:

- GHG national inventory systems: 16 countries
- LEDS/sectoral roadmaps: 18 countries
- NAMA design: 21 countries
- MRV system design: 23 countries
- Private sector engagement: 12 countries
- I/NDC preparation: 26 countries
- NDC implementation: 9 countries.

Twenty-five countries³ (majority LECB legacy countries) continue to receive funding from the joint NDC Support Programme, a follow up Programme supported by the EU and the governments of Germany and Spain. Officially launched at COP 23 in 2017 the NDC Support Programme builds off of work completed under the LECB Programme.

² LDCs could draw on specific strategies, plans or projects to formulate their contributions, and specify the component of the contribution that would be conditional upon receiving international finance or other support.

³ Argentina, Bhutan, Brazil, Costa Rica, Chile, Colombia, Cote d'Ivoire, Democratic Republic of the Congo, Ecuador, Ghana, Guatemala, Kenya, Lao PDR, Lebanon, Morocco, Nigeria, Paraguay, Peru, Philippines, Thailand, Trinidad & Tobago, Uganda, Vanuatu, Vietnam and Zambia.

Table 1: Programme overview

Country	Project period	Area	Thematic Scope						SECTORS PRIORITISED						
			Comp 1				Comp 2	Comp 3	Energy	Transport	Waste	Agriculture	Industry	Other	
			GHG Inventory	NAMAs	LEDS	MRV	Private sector	INDC							
Sub-Saharan Africa															
DRC	2012 - 2016	Public	X	X	X	X			X			X			
Ghana	2013 - 2017	Public	X	X	X	X	X	X	X						
Kenya	2013 - 2016	Public	X	X		X			X	X	X				
Nigeria	2015 - 2016	Public						X							
Sierra Leone	2015 - 2016	Public						X							
Tanzania	2014 - 2018	Public	X	X	X	X		X	X	X					
Uganda	2012 - 2017	Public	X	X	X	X		X	X	X	X	X			
Zambia	2012 - 2017	Public	X	X		X			X	X	X	X			
Asia and the Pacific															
Bhutan	2012 - 2017	Public	X	X	X	X		X		X	X		Industrial processes		
China	2012 - 2014	Private					X						Motorcycles, aluminium alloy		
Indonesia	2013 - 2018	Both		X	X	X		X	X	X			Commercial EE		
Lao PDR	2015 - 2017	Public						X							
Malaysia	2013 - 2016	Both	X	X		X			X		X	X	Green technology		
Philippines	2012 - 2018	Public	X		X	X	X	X		X	X	X	Industrial processes		
Samoa	2015 - 2018	Public						X							
Solomon Islands	2015 - 2015	Public						X							
Thailand	2013 - 2018	Both	X			X	X			X	X		Cement, steel		
Vanuatu	2015 - 2017	Public						X							
Viet Nam	2012 - 2018	Both		X		X	X						Fertilizer, pulp & paper		
Latin America and the Caribbean															
Argentina	2012 - 2018	Both	X		X	X		X					Fertilizer, petrochemical		
Barbados	2015 - 2018	Public						X							

Country	Project period	Area	Thematic Scope						SECTORS PRIORITISED						
			Comp 1				Comp 2	Comp 3	Energy	Transport	Waste	Agriculture	Industry	Other	
			GHG Inventory	NAMAs	LEDS	MRV	Private sector	INDC							
Bolivia	2015 - 2018	Public						X							
Chile	2012 - 2017	Both	X	X	X	X	X		X	X				Forestry	
Colombia	2012 - 2017	Public		X	X	X	X		X	X	X	X	Industrial process, mining		
Costa Rica	2013 - 2016	Public	X	X	X	X	X			X		X			
Ecuador	2012 – 2016	Public	X	X	X	X	X	X	X						
El Salvador	2015 - 2018	Public						X							
Honduras	2015 - 2017	Public						X							
Mexico	2012 - 2017	Private	X	X	X	X	X						Chemicals, mining		
Paraguay	2015 - 2016	Public						X							
Peru	2013 - 2016	Public	X	X		X			X				Cement, brick, steel		
St Vincent & Grenadines	2015 - 2017	Public						X							
Suriname	2015 - 2017	Public						X							
Trinidad & Tobago	2014 – 2017	Public		X	X	X		X	X	X			Mining		
Arab States															
Egypt	2012 - 2018	Both		X	X	X	X	X	X	X	X	X	Cement, fertilizer, iron & steel	Housing, tourism	
Lebanon	2012-2018	Public	X	X	X	X		X	X	X	X				
Morocco	2012-2016	Public		X	X	X		X	X		X	X		Housing	
Europe and the Commonwealth of Independent States															
Moldova	2014 - 2017	Public	X	X	X	X			X		X				
	38		18	21	18	24	11	25	17	14	12	9	13	3	

3. Overall results and achievements of the LECB Programme

Chapter 3 focuses on the main achievements of LECB and activities carried out by the national stakeholders in three components and five modules in the Programme as well as their respective results. Section 3.1 – 3.3 give examples of activities carried out by the national teams. The activities are listed according to the main activities in the Description of the Action (as per Addendum no. 3). Under each component are also tables summarising the overall results of the components according to the Programme objectives of the Action. In section 3.4 is a listing of the main challenges encountered by the national teams and the GSU during the implementation of LECB. These challenges are categorised according to the three components. More information on the single activities can be found in the Result and Impact summaries presented in Annex II.

Box 1: National Outcome and Impact

National Low Carbon Product Standards issued for China's extruded aluminium alloy profiles industry based on LECB project's work in Guangdong

Guangdong province is a prominent hub for the manufacturing as well as consumption of extruded aluminium alloy profiles in China. Guangdong's annual production of extruded aluminium profiles exceeds three million tonnes and has a total production value of over 15 billion US Dollars.

The LECB project activities in Guangdong province were instrumental for the issuing of national standards to promote low carbon products and certification in the extruded wrought aluminium alloy profiles industry. Two guiding technical documents on 'Low Carbon Certification Standards and GHG Accounting Methodologies' and on 'Low Carbon Product Certification Rules' for extruded wrought aluminium alloy profiles, delivered by the project's Guangdong workgroup, were issued and implemented as national standards by the Certification and Accreditation Administration of China in 2014.

The workgroup undertook detailed review of international and national low carbon product certification standards and GHG accounting methodologies, product related technical standards and documents, and industry characteristics relevant to aluminium alloy extruded profiles. Research was also conducted on the production processes, key components, and energy consumption for extruded aluminium profiles with extensive engagement of private enterprises and experts through questionnaires, meetings, and field visits. The Guangdong team issued questionnaires to enterprises in the aluminium profile production industry on their knowledge on low carbon development, opinions and suggestions on the national low carbon product certification, present situation of energy management, and three-year statistics of output and energy consumption. The team received more than 40 responses to the questionnaires.

Increased capacity in public to address mitigation challenge

The main achievement that is mentioned in all country summaries is the raised awareness in the public and private sector on mitigation of GHG emissions and the country's potential for contribution, the increased capacity to collect, compile and report data on GHG emissions and the establishment of sector teams to facilitate cross-sector collaboration on mitigation actions. For example, it was expressed in the DRC country summary that *"(we) learnt how to conduct multi-sectoral environmental debates on the climate and mitigation of GHG emissions with technical support from the Ministry of the Environment and project team"*. This capacity was built by continuous effort from the GSU, the UNDP country offices and the technical support structure in general.

Increased buy-in for GHG emission reductions

A key feature of the LECB Programme, which is also mentioned in virtually all country summaries as being instrumental in contributing to sustainable results, is flexibility. The flexibility of LECB allowed openness to understand, support and align to the specific policy processes in the countries. Many countries went a long way to strengthen and institutionalize GHG inventory systems and develop LEDS,

NAMAs and MRV systems because they found that there was flexibility to align and customise these products to their national priorities and development agendas.

**Box 2: National Outcome and Impact
Uganda's Green Growth Development Strategy**

The development of the Uganda Green Growth Development Strategy (GGDS) was one of the unexpected results of the LECB Programme which has opened the door for the promotion of a green economy. The GGDS was developed in a participatory process led by the Uganda National Planning Authority and the Climate Change Department. The strategy and associated implementation roadmap seek to

- (i) accelerate economic growth and raise per capita income through targeted investments in priority sectors with the highest green growth multiplier effects;
- (ii) achieve inclusive economic growth along with poverty reduction, improved human welfare and employment creation;
- (iii) ensure that the social and economic transition is achieved through a low carbon development pathway that safeguards the integrity of the environment and natural resources.

The target areas are: sustainable agriculture, natural capital management and development, planned green cities, sustainable transport, and green energy growth.

Institutional strengthening for climate change

The increased awareness at both political and technical level in the public sector build up through the LECB actions and the buy in to the mitigation agenda led to political and administrative decisions that strengthened institutions responsible for coordination of climate change actions and/or sectoral ministries. This achievement is highly likely to have a great impact on mitigation actions and GHG emission reduction ambition in the future. For example, through the Programme Uganda established a central GHG Unit and

supported the improvement of the Decree for the National Registry of Emission Reductions in Colombia and Ministerial Decision 99/1 on mandatory carbon emission reporting in Lebanon. In general, institutional arrangements were set up for establishment, coordination, management of GHG inventory systems with associated national or sectoral MRV systems which has led to their institutionalization resulting in better more regular reporting data.

Unexpected National Outcomes

As mentioned above, the LECB Programme applied a highly flexible approach in order to align to national processes and priorities and to gain buy-in from policy-makers. This on the one hand led to a less than streamlined process that required a lot of resources from the GSU, but on the other hand it contributed to important but unexpected national outcomes. Although unexpected, many of these outcomes contributed significantly to creating further awareness, consolidating the actions and other results of the LECB Programme support and paving the way for low carbon solutions. This led to the unique national outcomes in many countries and built greater ownership of the respective climate actions.

China was one country that keenly participated in the LECB Programme but early on set its own agenda of developing Low Carbon Product Standards for different energy intensive products (See box 1). Uganda is another example where a Green Growth Development Strategy was elaborated. (See box 2)

To illustrate the diversity and quite high-level nature of these outcomes, five examples are presented in text boxes in this final report where they illustrate a case on unexpected results or outcomes or how specific challenges were dealt with.

The LECB Programme has had seven overall main achievements that are described in the following.

Knowledge products valuable beyond the lifetime of the Programme

Apart from the formal GHG inventory systems, LEDS, NAMAs and MRV systems, the LECB Programme supported the elaboration of a wealth of knowledge products such as manuals, guidance on gender and

mitigation, tools for tracking climate financing and expenditure, baseline studies, feasibility studies, and factsheets available in different languages – elaborated by both the GSU and the national projects. Moreover, newsletters, information briefs and other communication materials including web-based materials were elaborated (for further information, refer to Annex 1 – *LECB Programme contributions to global visibility and knowledge exchange*). These knowledge products served as important technical support and guidance for the public and private sectors in beneficiary countries during the Programme implementation, but many of the products are likely to be relevant more widely for public and private sector institutions that are entering low carbon pathways beyond the lifetime of the Programme and in countries outside the Programme.

Groundwork laid for implementation of NDCs

An important achievement was the contribution to laying the foundation for mitigation action by developing country capacities and awareness. The institutional coordination mechanisms developed to elaborate LEDS and NAMAs can be seen as pilot mitigation actions and strategies in middle-income countries and LDCs. Some of the countries that had previously focused primarily or exclusively on climate change adaptation and disaster risk reduction began also to look at mitigation options. Awareness raising, capacity building and cross-sector cooperation contributed to creating knowledge, expertise, data management systems and institutional arrangements at country level that also went into elaborating the INDCs and has continued to inform NDC implementation in a post-Paris era. An example of this is Lebanon, where the data, stakeholder information, governing/decision-making body from their LECB-supported NAMAs (waste and transport) were used for the elaboration of their INDC and are continuing to be used and built upon for NDC implementation planning. In this way LECB through the institutional coordination mechanisms and the development of NAMAs and LEDS facilitated a process of mainstreaming mitigation that may be directly linked to transformation of socio-economic development towards a low-carbon pathway in the countries supported.

Sustaining complex customised processes in 38 countries in up to six years

LECB sustained working processes in 38 different countries over a period of up to six years with a quite high degree of complexity and customisation to the individual country context. The GSU provided strategic guidance, development of guidelines and knowledge products, technical support, and opportunities for sharing of experiences. Some countries received support under all three components, while the 13 added in 2015 only received support with the elaboration of their INDC. Even with the complexity of demands from the national projects the GSU managed to adapt by increasing staff, making further use of the regional and country offices of UNDP and adjusted the technical inputs from the “NAMA Net” consortium to meet expectations from the public and private institutions, so that the all country projects were followed up and finalised.

3.1 Component 1: Public Sector Capacity Building on MRV, NAMAs and LEDS

Module 1.1 National GHG emission inventory systems

The overall objective of Module 1.1 was to strengthen the technical and institutional capacity of developing countries to establish/improve national GHG inventory systems. 18 middle-income countries and LDCs received support for elaboration and/or enhancing the national GHG inventory system. As can be seen from the examples in table 2 there is a diversity of different approaches and activities.

Main country-led activities on building GHG inventory systems

Within each LECB project many activities at the national or sub-national level were carried out in order to build capacity and design national frameworks for GHG inventories. In the table below, select examples of activities are provided according to the key activities in the Description of the Action.

In general, the support to the GHG inventories consisted in convening broad stakeholder groups, raising awareness about the import of reliable and accurate inventories, capacity building on the Inter-Governmental Panel on Climate Change (IPCC) methodology for building GHG inventories, carry out of baseline studies, assessment of data quality, and the development and launch of digital databases to collect and store national, and at times sub-national data.

Table 2: Examples of inventory activities carried out by national teams

Overall activity	Selected activities carried out
<i>Build capacity for national systems for preparation of GHG inventories and national communications</i>	<p>Argentina:</p> <ul style="list-style-type: none"> • Trained personnel in 90% of the provinces (22 provinces) to develop their provincial GHG emission inventories, identify mitigation measures and prioritise these measures based on the province’s development priorities • 9 training videos on GHG inventories, mitigation actions, and NDC targeting sub-national governments <p>Philippines:</p> <ul style="list-style-type: none"> • 18 sectoral scoping meetings/engagement dialogues with key Ministries • Two intensive training workshops on the national GHG inventory system engaging over 15 key staff members. • 9 larger trainings for national and sub-national Ministry representatives (three for agriculture sector, two each for waste, industrial processes, and transport sectors, and one for integration of GHG emission data) • Three trainings on use of 2006 IPCC Worksheets and software for IPPU, solid waste and waste water sectors <p>Mexico:</p> <ul style="list-style-type: none"> • 3 training courses to support companies to report and verify GHG emissions for 30 companies from two sectors <p>Malaysia:</p> <ul style="list-style-type: none"> • Training material on GHG inventory reporting requirements, IPCC guidelines, inventory data collection, QA/QC, and uncertainty analysis, tailored to the Malaysian context has been designed and rolled-out • A training module on preparing GHG inventory for the solid waste disposal using IPCC Guidelines and software has been developed and used to train personnel from key agencies • Trainings have focused on the use of tools such as the Agriculture and Land Use National Greenhouse Gas Inventory (ALU) software <p>Kenya:</p> <ul style="list-style-type: none"> • Experts trained on IPCC GHG inventory software for estimating emissions and removals • 1 GHG inventory-training manual was developed for future training reference <p>Ghana:</p> <ul style="list-style-type: none"> • Two GHG inventory manuals (Guidance on Uncertainty Management for National Greenhouse Gas Inventory and National Greenhouse Gas Inventory Manual of Procedures) were developed • Training workshops provided to 14 thermal power plants, covering plant specific data collection and reporting of GHG emissions. <p>Colombia:</p> <ul style="list-style-type: none"> • 38 capacity building workshops held in four regions,

	<ul style="list-style-type: none"> • Guide for NAMA formulation and evaluation elaborated <p>Egypt:</p> <ul style="list-style-type: none"> • 9 workshops held on raising awareness and presenting the LECB work
<i>Design and establish national systems for preparation of GHG inventories and national communications</i>	<p>Philippines:</p> <ul style="list-style-type: none"> • Guidance document which clarifies the institutional arrangements and coordination mechanism • Reference Manual on the National GHG inventory that identifies data requirements, calculation methodologies, and reporting templates • Four workshops with government agencies to engage/discuss inventory planning procedures and sectoral templates • Two inter-agency meetings convened by the CCC to finalise the CCC Resolution <p>Kenya:</p> <ul style="list-style-type: none"> • The Climate Change Secretariat (now Climate Change Directorate) was established in 2013 through support and backstopping from the LECB Programme • Development of a National Climate Change Technology Action Plan <p>China:</p> <ul style="list-style-type: none"> • 1 Low carbon product Standards and GHG Accounting Methodologies prepared for Motorcycle and Wrought Aluminium Alloy Extruded Profiles <p>Chile:</p> <ul style="list-style-type: none"> • “Climate Change Academy” was established to build capacity in local government
<i>Establish institutional frameworks and coordination mechanisms to ensure periodic GHG inventory and NC updates</i>	<p>Bhutan: To ensure the regular updating of the GHG inventory and forest carbon data into the Environment Information Management System (EIMS) and improving the National Forest Inventory (NFI) the project conducted essential capacity-building trainings and workshops to sensitise data providers throughout contributing ministries and public institutions</p> <p>Moldova:</p> <ul style="list-style-type: none"> • A roster of national experts was established

Results achieved in the support to strengthening of GHG inventories

The expected result of Module 1.1. on GHG inventories was to ensure higher quality of national greenhouse gas inventories and reporting structures as well as regular updates. The table below provides a summary of the results that the countries achieved in this area. For middle-income countries like Malaysia and Philippines the activities took their point of departure in already existing initiatives on GHG inventories and the results were enhanced inventories. For the majority of the countries the GHG inventories were developed for all sectors or only selected sectors and the groundwork was laid for a national GHG inventory system. As can be seen from table 3, the GHG inventories are in various stages of finalisation in the different countries. The finalisation and subsequent regular update depend a lot of the political buy in at the national level.

The capacity building on GHG inventories assisted countries in submitting their National Communications and Biannual Update Reports. Only a handful of developing countries i.e. Peru, Chile and Vietnam had submitted the BUR within that deadline of December 2014. However, in 2015-2016, 12 countries covered by LECB capacity building submitted their BUR, namely: Mexico, Thailand, Moldova, Morocco, Malaysia, Lebanon, Indonesia, Ghana, Ecuador, Costa Rica, Colombia, and Argentina. The high number of submissions suggests that LECB provided a substantial impetus to finalise and submit BURs.

The exercise of establishing the GHG inventories have been very useful for various purposes e.g. the BURs and NCs but it is likely that the national authorities in many of the countries are not ready yet to invest in

regular updates. This is related to the challenges described in section 3.4 e.g. diverging political agendas and lack of resources to provide the continuous investment in update and maintenance of the systems established.

Table 3: Summary of country work on establishing/strengthening national GHG inventory systems

Country	National GHG Inventory System
1. Argentina	<ul style="list-style-type: none"> National GHG Inventory System developed for 2 sectors (energy and agriculture, forestry and other land use), including new databases
2. Bhutan	<ul style="list-style-type: none"> National GHG Inventory System documented using USEPA workbook Database created National Forest inventory officers capacitated, and data strengthened
3. Chile	<ul style="list-style-type: none"> National GHG Inventory System, developed 4 sector GHG Inventories in Energy, IPPU, AFOLU, and Waste sector A free standardised calculation tool for GHG emissions has been developed
4. China	<ul style="list-style-type: none"> Low Carbon Certification Standards and GHG Accounting Methodologies
5. Colombia	<ul style="list-style-type: none"> Supported improvement of the Decree for the National Registry of Emission Reductions.
6. DRC	<ul style="list-style-type: none"> National GHG Inventory System documented using USEPA workbook
7. Ecuador	<ul style="list-style-type: none"> Developed GHG inventory system for 3 sectors (energy, agriculture and waste)
8. Ghana	<ul style="list-style-type: none"> One (1) online national system launched for preparation of GHG inventories (CC Hub), in collaboration with GIZ
9. Kenya	<ul style="list-style-type: none"> One (1) national GHG inventory system documented using US EPA workbook. One (1) database designed
10. Lebanon	<ul style="list-style-type: none"> Ministerial Decision 99/1 on mandatory carbon emission reporting supported
11. Malaysia	<ul style="list-style-type: none"> Capacity building and strengthening quality of the national GHG inventory
12. Moldova	<ul style="list-style-type: none"> Technical reviews of energy and LULUCF sector inventories
13. Peru	<ul style="list-style-type: none"> Inventory guidelines for online platform (INFOCARBONO) supported for five (5) sectors
14. Philippines	<ul style="list-style-type: none"> Online institutionalised GHG inventory system launched User manuals and data population completed
15. Tanzania	<ul style="list-style-type: none"> National GHG Inventory Management System was completed
16. Thailand	<ul style="list-style-type: none"> Guidance manuals and training documents for 2 sectors (waste, transport)
17. Uganda	<ul style="list-style-type: none"> One (1) national GHG inventory system documented using US EPA workbook GHG unit established One (1) online data management system established
18. Zambia	<ul style="list-style-type: none"> One (1) national GHG inventory system documented using US EPA workbook One (1) online data management system proposed and approved

Module 1.2 on capacity building for elaboration of NAMAs and LEDS

The overall objective of Module 1.2 was to formulate NAMAs and/or LEDS in the context of national development. Twenty-one countries received support to build up public sector capacity to elaborate NAMAs while 18 countries received support to elaborate LEDS. (See table 1 above).

When the LECB Programme was launched in 2011, NAMAs, LEDS, and MRV were relatively new concepts still under negotiation within the UN climate change talks. At the time there was a lot of international debate about the definition of these concepts. The LECB Programme contributed significantly to this debate and to awareness-raising through the capacity building at the national level in the developing countries covered by the Programme.

Main activities country-led activities on developing NAMAs and LEDS

Table 4 provides examples of national-level activities to enable the elaboration of NAMAs and LEDS. There have been a multitude of activities, so the table does not give exhaustive information on this aspect.

Table 4: Activities under Module 1.2 responding to the main activities foreseen in the EU Action Document

Capacity building activities on NAMAs and LEDS	Selected activities on NAMAs and LEDS
<i>Develop institutional capacities and support decision makers to coordinate, plan, design, implement and evaluate NAMAs and LEDS, and integrate financial planning into the design and implementation of NAMAs and LEDS in key sectors and selected countries</i>	<p>Bhutan: Study on international best practices on intelligent transport system implementation</p> <p>Thailand: 20 capacity building trainings have been conducted in the cement and steel sectors</p> <p>Morocco: 9 workshops at national and subnational level</p> <p>Moldova: a total 8 workshops and trainings were organised for capacity building</p> <p>Kenya: 3 meetings with the Thematic Working Groups and lead agencies on Transport, Waste and Energy</p> <p>Egypt: 4 national capacity building workshops presenting NAMA mapping reports in Tourism, Oil & Gas, Housing, Agriculture and Health</p>
<i>Develop decision support tools for prioritised/fast-tracked NAMAs in selected countries</i>	<p>Thailand: Data collection templates and guideline manuals have been prepared in Thai language for the transport and waste sectors to aid in quick and accurate processing and transfer of activity data between concerned institution</p>
<i>Identify and prioritise mitigation actions and low-emissions strategies in key areas/sector</i>	<p>DRC: NAMA ideas identified by WGs in the sectors of agriculture, energy, transport, waste, and construction, and prioritised in short/medium/long term</p> <p>China: Low carbon product Certification Implementation Plans designed for Chongqing city and Guangdong province</p>
<i>Identify policy, financing and technology instruments to implement mitigation actions and low-emissions strategies and establish policy frameworks to facilitate the mainstreaming and implementation of NAMAs and LEDS in selected countries</i>	<p>Ghana: The Parliamentary committee on environment proposed that in the allocation of the national budget, all projects are reviewed with reference to NDCs</p> <p>Egypt: Low Carbon Development Guide for hotel and resort investors</p> <p>Costa Rica: National Operating Manual for Livestock NAMA</p> <p>Colombia: Carbon Tax within the Tax Reform of 2016</p> <p>China: Pilots and Demonstration conducted for Low Carbon Product Certification (air conditioners, aluminium profiles, general portland cement, household electric refrigerators, flat or plate glass, motorcycles, small and medium 3-phase asynchronous motors). Low carbon product certifications were issued to six enterprises in Chongqing and to three enterprises in Guangdong</p>
<i>Establish and facilitate dialogue platforms for mitigation actions and low-emissions strategies and engage a broad constituency of national actors to create an enabling environment that accelerates mitigation up-scaling in selected countries</i>	<p>China: A low carbon products campaign was launched with the support of Chongqing Development and reform Commission on the <i>National Low Carbon Day</i> and involved of various enterprises</p> <p>Lebanon: Four training sessions have been organised between October 2016 to July 2017 and a guidebook has been prepared to assist the private sector to devise climate change actions</p> <p>Kenya: Establishment of a pilot National Technology Innovation Centre in Samburu County, as a business information centre to promote community education on green technologies</p> <p>Ghana: NAMA Private Sector Platform established with members from energy, waste, agriculture, forestry, transport and industries; NAMA Investor Guide elaborated</p> <p>Egypt: One-week workshop for media representatives was delivered with the aim of increasing the citizen’s knowledge base and raising awareness</p>

Ecuador: Training in climate change mitigation for the general public and especially for young people was also carried out through dialogues, camps and conferences
DRC: Establishing inter-institutional dialogue on the problem of emission reduction in the various economic development sectors

Results achieved in the area of LEDS and NAMAs

The expected results were to:

- Catalyse short-term mitigation actions by supporting identification of NAMAs and LEDS, including financing needs and capacity building requirements
- Support the effective formulation of NAMAs and LEDS, especially those that require international involvement or seek international recognition

The elaboration of LEDS began quite late but around 2013 many countries had made good progress. Chile, Tanzania, Lebanon, Morocco and the Democratic Republic of Congo prepared an initial LEDS while Moldova updated its LEDS. Uganda followed another path and elaborated a Green Growth Development Strategy, which was an unexpected outcome (See box 2 for details). Also, Argentina chose to elaborate 3 sectoral mitigation action plans for energy, transport and forestry. Most countries elaborated LEDS for specific prioritised sectors for e.g. energy, transport, waste, mining, construction and tourism. The Philippines elaborated a national mitigation strategy.

Table 5: Summary of LEDS and associated studies prepared under LECB Programme

Country	Low Emission Development Strategies
1. Argentina	<ul style="list-style-type: none"> • Three (3) sectoral mitigation action plans/NDC roadmaps completed (energy, transport and forestry – the latter with UN-REDD) • Two (2) sectoral plans in development (infrastructure and agro-industry)
2. Bhutan	<ul style="list-style-type: none"> • Three (3) sectoral mitigation action plans/NDC roadmaps completed (transport, human settlements, and energy efficiency) • National transport policy updated (recommendation of transport LEDS) • Intelligent Transport System analysis⁴
3. Chile	<ul style="list-style-type: none"> • One (1) Low Emission Development Strategy • Support to design of National Action Plan on Climate Change (2017-2022)
4. Colombia	<ul style="list-style-type: none"> • Eight (8) sectoral mitigation action plans completed (mining, hydrocarbons, electric power, housing/ territorial development, waste/wastewater, transport, industry, agriculture). Implementation piloted sub-nationally
5. Costa Rica	<ul style="list-style-type: none"> • One (1) LEDS roadmap prepared for transport sector, including public and private sector opportunities and incentives, cost-benefit analysis and marginal abatement cost curves for low-emission technologies • One (1) vehicle fleet quantification study
6. DRC	<ul style="list-style-type: none"> • One (1) national LEDS completed (2016-2050)
7. Ecuador	<ul style="list-style-type: none"> • Supported National Mitigation Plan (inputs for energy, agriculture and waste sectors)
8. Egypt	<ul style="list-style-type: none"> • 2 LEDS completed (tourism, cross-sectoral) • 1 LECB consolidated report • 5 LECB Mitigation Action Plans (incl. MRV): for the fertilizer sector, 1 for the iron and steel sector • Mapping of mitigation actions in eleven (11) sectors
9. Ghana	<ul style="list-style-type: none"> • One (1) national GHG mitigation plan prepared

⁴ 3 million USD approved by GEF through projects from WB and UNDP to intelligent urban public transport system and electric mobility (also based on study mentioned above)

10. Lebanon	<ul style="list-style-type: none"> • 1 LEDS (will be further elaborated and integrated into national strategies through the NDC Support Programme in 2019) • Lebanon Climate Act supported
11. Mexico	<ul style="list-style-type: none"> • One (1) sectoral LEDS prepared (chemical industry)
12. Moldova	<ul style="list-style-type: none"> • National LEDS updated to 2030
13. Morocco	<ul style="list-style-type: none"> • One (1) national LEDS prepared
14. Peru	<ul style="list-style-type: none"> • One (1) sectoral LEDS prepared (construction)
15. Philippines	<ul style="list-style-type: none"> • One (1) national mitigation strategy and goals
16. Tanzania	<ul style="list-style-type: none"> • One (1) national LEDS framework prepared
17. Trinidad and Tobago	<ul style="list-style-type: none"> • Four (4) sectoral low carbon development action plans completed • Policy and legislation recommendations to advance mitigation actions prepared
18. Uganda	<ul style="list-style-type: none"> • One (1) Green Growth Development Strategy developed and launched by prime minister (in collaboration with the Global Green Growth Institute (GGGI))

A summary of the most advanced NAMA proposals designed to date is provided in Table 6. In total, 17 NAMA concepts and 48 detailed NAMAs⁵ were prepared and an additional five NAMAs are under implementation. Three countries also implemented pilot activities associated with NAMAs to inform the design process. Seventeen out of 21 countries prioritised elaborating a NAMA in the energy sector. Therefore, 35% of the detailed NAMAs are within energy. Fourteen countries identified the need for developing a NAMA in the transport sector while 12 countries elaborated a NAMA in the waste sector. Nine countries prioritised the agriculture while only two selected forestry. Thirteen countries identified the need for mitigation within different industrial sectors and there were 3 countries that worked with NAMAs in other sectors.

Table 6: Advanced NAMAs prepared under the LECB Programme, by country

Country	Stage	Sector	NAMA title	Status of implementation
1. Bhutan	Detailed	Transport	NAMA for Enhancing Urban Transport in Bhutan	Seeking funding (may be funded through World Bank)
	Detailed	Waste	Municipal Solid Waste NAMA	Seeking funding
2. Chile	Concept	Waste	Energy Utilisation of Waste by the Generation of Biogas	De-prioritized at concept stage
3. Colombia	Detailed	Agriculture	Colombian Coffee NAMA	Directly contributing to the agricultural sector targets and actions in NDC implementation plans
	Detailed	Agriculture	Productive & Technological Reconversion of Panela Sector	Directly contributing to the agricultural sector targets and actions in NDC implementation plans
	Detailed	Agriculture	Sustainable Bovine Livestock NAMA	Directly contributing to the agricultural sector targets and actions in NDC implementation plans. Prioritized highly.
	Detailed	Energy	Renewable Energy for Off-Grid Areas NAMA	Seeking funding

⁵ A concept is defined as a NAMA containing around 10-30 pages of description, but no financing or MRV plan, while a detailed NAMA contains 50-100 pages of description including all key information. Many countries also developed fact sheets on promising NAMA ideas as part of the NAMA prioritization processes that took place in-country.

	Detailed	Energy	Energy Efficiency in Hotels NAMA	Seeking funding
	Detailed	Industry	Industry NAMA (Logistics optimisation and transport)	Directly contributing to the NDC implementation planning in the industry sector. Being further developed through the NDC Support Programme.
4. Costa Rica	Detailed	Agriculture	Livestock Farms NAMA	Piloted on 20 farms
5. Democratic Republic of Congo	Detailed	Energy	Capture of methane from gas/oil flaring	Seeking funding
	Detailed	Energy	Sustainable charcoal production	Seeking funding
6. Ecuador	Detailed	Energy	Program of Efficient Cooking	Under implementation and contributing to NDC targets
	Detailed	Energy	Optimisation of Power Generation and Energy Efficiency	Under implementation and contributing to NDC targets
	Detailed	Energy	Hydropower Development Program	Under implementation and contributing to NDC targets
7. Egypt	Detailed	Agriculture, boilers, charcoal, EE&RE, industry, river transport, waste to energy	Use of biomass (agricultural waste) 5 sector NAMAs (incl. MRV) for boilers, charcoal, EE & RE in industry, river transport, waste-to-energy	Seeking funding. Targets fulling incorporated in NDC
	Concept	Energy/Water	Water pumping using solar energy	De-prioritized at concept stage
8. Ghana	Detailed	Energy	Access to Clean Energy through Establishment of Market-Based Solutions in Ghana	Seeking funding
9. Indonesia	Concept	Housing, biodiesel, solar PV	Energy Efficiency Measures in City Hall (Block H)/DPRD DKI Jakarta Office Toward Green Building Government sign-off of 2 NAMAs (Solar PV, biodiesel)	De-prioritized at concept stage
	Detailed	Transport	Bus rapid transit, Greater Jakarta	Seeking funding
	Concept	Biofuel	Utilisation of Used Cooking Oil Biodiesel in Building Sector Toward Green Building	De-prioritized at concept stage
	Concept	Energy	Installation of Solar PV Toward Green Building in DKI Jakarta	De-prioritized at concept stage
10. Kenya	Detailed	Energy	Market based approach for cleaner cooking solutions and income (activities powered by renewables)	Pilot in Samburu County
	Detailed	Waste	Emission Reduction through Sustainable Solid Waste Management in Nairobi with focus on reuse and recycling	Pilot in Nairobi country running, intention of upscaling to Nakuru County.

	Detailed	Transport	E Bus Rapid Transport system (eBRT) in greater Nairobi	Seeking funding
11. Lebanon	Detailed	Waste	Municipal Solid Waste Sector	The NAMAs were approved by the Council of Ministers which guarantees implementation in the long-term. Both have been included in the Lebanese NDCy
	Detailed	Transport	Private Road Transport Sector	
	Concept	Energy	National Grid Assessment and Grid Code for the Integration of Wind and Other Renewable Energy Sources	Picked up and further developed by WB
12. Malaysia	Concept	Forestry	Avoided Emissions from Peat Swamp Forest Management and Central Forest Spine Ecological Connectivity in South East Pahang	De-prioritized at concept stage
	Concept	Waste	Support to Integrated E-Waste Management System for State of Sabah	De-prioritized at concept stage
	Concept	Transport	Towards Energy Efficient Two-Wheelers in Malaysia	De-prioritized at concept stage
	Concept	Energy	Feed-in Tariff recognition	De-prioritized at concept stage
	Concept	Habitat	Eco-territory NAMA in Langkawi Island	De-prioritized at concept stage
	Concept	Energy	Power generation	De-prioritized at concept stage
13. Mexico	Detailed	Energy	Energy Efficiency in the industrial sector (Combined Heat and Power)	Seeking funding
14. Moldova	Detailed	Energy	Replacing incandescent bulbs with energy-efficient LED bulbs in public sector buildings	Seeking funding
	Detailed	Forestry	Afforestation of degraded, impracticable for agriculture, lands	Seeking funding
	Detailed	Power	Promotion of small-scale CHPs	Seeking funding
	Detailed	Waste	Construction of a regional landfill and transfer stations for solid wastes for the cities, Ungheni, Nisporeni, and Calarasi	Seeking funding
15. Morocco	Detailed	Agriculture	Promotion of 'arganiculture' (Argan oil)	Under implementation with GCF funding, US\$39.4 million
	Detailed	Housing	GHG mitigation strategy in the Housing sector	Seeking funding
	Detailed	Waste	NAMA study for Household Waste	Seeking funding
16. Peru	Detailed	Construction	NAMA for the Brick sector	MRV in operation designed by Swiss Contact
	Detailed	Construction	NAMA for the Cement sector	The World Bank initiative: Partnership for Market Readiness (PMR). Co-processing in cement production now allowed in Solid Waste Management Law

	Detailed	Construction	NAMA for the steel sector	Seeking funding
17. Tanzania	Concept	Transport	Dar es Salaam Bus Rapid Transport (DAR BRT) NAMA	De-prioritized at concept stage
18. Trinidad & Tobago	Detailed	Energy	Renewable Energy Promotion in the Power Sector	Seeking funding
	Detailed	Industry/ Mining	Flaring and Venting Reduction in the Industry Sector	Seeking funding
	Detailed	Industry	Financial Incentives for Emission Reduction in the Petrochemical and Heavy Industry Sub-sector	Seeking funding
	Detailed	Transport	Integrated public transport system	Seeking funding
19. Uganda	Detailed	Energy	Integrated Sustainable Energy Solution for Schools in Off-grid Areas in Uganda Promotion of the use of efficient stoves in educational institutions NAMA	NAMA Facility DPP phase, Euro 15 million
	Detailed	Energy & Transport	Fuels and Transport Energy Efficiency in Uganda	Seeking funding
	Detailed	Waste	Concepts for Wastewater Treatment for agro-processing and Solid Waste RRR in Kampala City merged for GEF project: Integrated Waste Management & Biogas Production	Under implementation, GEF funding
	Concept	Transport	Bus Rapid Transit (BRT) for Kampala	De-prioritized at concept stage
	Concept		Periodic vehicle inspection for emissions and roadworthiness NAMA	De-prioritized at concept stage
	Detailed Concept	Agriculture	Climate-Smart Dairy Livestock Value Chains in Uganda Promoting cultivation of high-yielding upland rice in Uganda	Seeking funding
20. Vietnam	Detailed	Fertilizer	Fertilizer NAMA	Seeking funding
	Detailed	Cement	Cement NAMA	Seeking funding
21. Zambia	Detailed	Agriculture	Sustainable Agriculture through Integrated Crop and Livestock Farming	Seeking funding
	Detailed	Energy	Implementation of Selected Small Hydro Projects in Zambia	Seeking funding
	Detailed	Energy/ forestry	Increasing Efficiency in Harvesting, Processing and Use of Charcoal	Seeking funding
	Detailed	Waste	Integrated Waste Management	Seeking funding
	Detailed	Transport	Green Urban Mobility Solution for Zambian City Integrated Tramway (ZAMCIT)	Seeking funding

Module 1.3 MRV systems

The overall objective of Module 1.3 is to develop MRV systems to support implementation and evaluation of NAMAs and/or LEDS. LECB supported the public and private sector in 24 countries designing MRV components under the LECB Programme (Argentina, Bhutan, Chile, Colombia, Costa Rica, DRC, Ecuador, Egypt, Ghana, Indonesia, Kenya, Lebanon, Malaysia, Mexico, Moldova, Morocco, Peru, Philippines, Tanzania, Thailand, Trinidad & Tobago, Uganda, Viet Nam and Zambia) to address a range of needs – from defining NAMA-specific methodologies and reporting templates to higher-level indicators for LEDS and national development plans. Table 7 give specific examples on national activities to promote MRV systems.

Main country-led activities on setting up MRV systems

In most cases, the development of MRV systems was directly linked to the elaboration of NAMAs and LEDS. There was also a strong correlation to the work on national GHG inventory systems. Many LECB countries were assessing how the inventory systems could inform and provide a basis for a more comprehensive national MRV system that take stock of progress on mitigation policies and actions and eventually even the (I)NDC.

Chile, Ecuador and Bhutan were undertaking Climate Public Expenditure and Institutional Reviews, or Climate Public Expenditure and Institutional Reviews (CPEIRs), through the LECB Programme⁶ The CPEIR was intended as a useful tool for the MRV of finance by helping Ministries of Finance, Planning and Environment to work together to gather evidence on the full breadth of climate change related expenditures in the domestic budget and identify how to strengthen the budget process to better address climate change. Fifteen other LECB countries have previously conducted CPEIRs with either UNDP or other development partner support.

Table 7: Key activities on development of MRV systems

Overall activities MRV systems	Selected capacity building activities
MRV systems to support implementation and evaluation of NAMAs and LEDS developed	
<i>Build capacity in MRV-related schemes for high government officials to support mitigation actions and low-emissions strategies and map/ engage institutions, criteria and mechanisms needed to request, approve, disburse, execute and report climate change mitigation expenditures in selected countries</i>	Egypt: MRV training, 31 January-1 February 2018, Cairo Morocco: 148 entities received capacity building in MRVs, exchange workshop was organised with the countries of the MENA region in collaboration with the EU Clima-South project in Marrakech on 16-17 April 2015, exchange workshops organised within the framework of the Africa Carbon Forum organised from 12 to 15 April 2015 in Marrakech Mexico: One day or half day seminars where companies from all sectors, learned how to use the internet on-line reporting platform
<i>Design MRV systems to support the implementation and evaluation of mitigation actions and low-emissions strategies</i>	Mexico: 10 feasibility studies were elaborated at different industrial plants to evaluate the viability of installing cogeneration systems, the study "A Mapping of Instruments, Actors and Recommendations for the General Structure of the MRV System in Mexico carried out by NAMA Net consortium
<i>Develop national information and monitoring technology systems including credible and country owned systems for tracking capital, debt and grant disbursements for climate change mitigation (select countries) and comprehensive sectoral MRV systems to support prioritised/fast-tracked NAMAs, in preparation for financial sources due</i>	Colombia: The MRV team of the Climate Change Division at the Ministry of Environment has developed a national MRV system that links to a National Registry of Emission Reductions, a Voluntary Corporate Reporting Program and MRV of financing. The system, which has been developed with inputs from international experts, will be rolled out in phases due to the complexity and time required to develop other system components Philippines: The NICCDIES (<i>National Integrated Climate Change Database and Information Exchange System</i>) system of the was

⁶ In Bhutan, LECB provides only partial funding while UNDP's Regional Service Centre in Bangkok provides remainder.

diligence, monitoring and result based budgeting systems

Strengthen capacities in NAMA development teams and finance officers to elaborate a sound financial structure and assessment criteria in prioritised/fast-tracked NAMAs in selected countries.

officially launched in October 2015. It consolidates climate change mitigation data and supports the three elements of the Philippine MRV system: (i) GHG Inventory; (ii) mitigation actions and LEDS; (iii) and MRV of support. The NICCDIES is intended as a “one-stop-shop” climate change information portal

Chile: The Climate CPEIR was completed. The Chilean Climate Change Financing Strategy will be further refined on the basis of the public and private finance flows mapping studies

Ecuador: The CPEIR was conducted in parallel with an analysis of private climate finance flows. The LECB climate finance team then organised two meetings in April 2016 with key experts to define scope and methodological approach, followed by a workshop in May at the Ministry of Finance to collect initial information with the participation of 32 technical officers from the public sector. The CPEIR team is also learning from the experience of the UNDP-supported BIOFIN analysis that has taken place in Ecuador and is collaborating closely with Chile on this work

Bhutan finalised its CPEIR which was conducted jointly with a BIOFIN study on biodiversity expenditures and, uniquely, also addressed poverty reduction dimensions at the request of the government

Results achieved in the area of National MRV systems

The expected result is to identify and address key barriers to enhance scaled-up mitigation action in the framework of LEDS/NAMAs/MRV.

Table 8: Summary of country MRV activities under LECB Programme

Country	MRV Systems Developed
1. Argentina	• 1 MRV system for NDC designed, based on implementation and operational indicators
2. Bhutan	• MRV proposed for three NAMAs (transport, solid waste and energy efficiency)
3. Chile	• MRV proposed for several NAMAs and support on integration into 1 national MRV system (collaboration with British Embassy and GIS) • One methodology for mapping private finance flows
4. Colombia	• National MRV document
5. Costa Rica	• MRV proposed for one NAMA (livestock)
6. DRC	• MRV proposed for NAMAs designed under LECB
7. Ecuador	• MRV system designed to support 3 NAMAs under implementation • One methodology for mapping private finance flows
8. Egypt	• MRV components developed as part of the NAMAs
9. Ghana	• MRV proposed for NAMAs designed under LECB
10. Indonesia	• MRV proposed for NAMAs designed under LECB • One methodology for mapping private finance flows
11. Kenya	• MRV proposed for NAMAs designed under LECB
12. Lebanon	• MRV proposed for NAMAs designed under LECB
13. Malaysia	• Verification guidelines for NAMAs, MRV guidelines, institutional arrangements for MRV prepared
14. Mexico	• One (1) national MRV system design proposed
15. Moldova	• Legal act for national MRV system prepared • Draft Government Decision for MRV prepared
16. Morocco	• MRV proposed for NAMAs designed under LECB
17. Peru	• MRV proposed for NAMAs designed under LECB

18. Philippines	<ul style="list-style-type: none"> • One (1) online platform for MRV (NICCDIES) designed • One (1) national MRV system design elaborated
19. Tanzania	<ul style="list-style-type: none"> • One (1) national MRV system was completed including analysis of sectoral emissions MRV portal (in prep.)
20. Thailand	<ul style="list-style-type: none"> • One methodology for mapping private finance flows
21. Trinidad and Tobago	<ul style="list-style-type: none"> • MRV proposed for NAMAs designed under LECB
22. Uganda	<ul style="list-style-type: none"> • MRV proposed for NAMAs designed under LECB
23. Vietnam	<ul style="list-style-type: none"> • MRV proposed for NAMAs designed under LECB • One methodology for mapping private finance flows
24. Zambia	<ul style="list-style-type: none"> • MRV proposed for NAMAs designed under LECB

3.2 Component 2: Mitigation actions and MRV by selected industries

Component 2 targeted countries with a more developed industrial sector, and thus larger potential for participating in emission reduction strategies. The main criteria for selecting countries for Component 2 were the degree to which the industrial sector was developed (i.e. with relatively high emissions) and the potential of the private sector to strengthen its capacity to play a proactive role in mitigation actions in the future. The component focused on the private sector's aims and needs in order to catalyse preparedness and readiness for implementation of selected mitigation actions. In addition, complementary support to public sector capacity-building in Component 2 countries was organised in order to foster synergies and cooperation between the public and private spheres.

The countries that were initially selected by the LECB Steering Committee to have a required private sector/industry work component under the LECB Programme were: Argentina, China, Egypt, Mexico, Indonesia, Malaysia, Thailand, and Viet Nam. However, Ghana and Chile also included nationally-tailored outcomes to directly target the private sector, namely the preparation of a NAMA Investor Guide to target private sector investment in the case of Ghana and a voluntary carbon reporting Programme in Chile. Peru's NAMAs were focused entirely on the private sector, namely the construction sector⁷. So that totalled 11 countries. Furthermore, five countries were selected for also carrying out the mapping of private climate finance flows, namely: Chile, Ecuador, Indonesia, Thailand and Viet Nam.

Module 2.1 Mitigation actions in selected private sectors established

Due to the strong demand from the majority of LECB countries to better engage the private sector in mitigation actions, the LECB Programme conducted a series of regional dialogues in 2014 and 2015 in Latin America, Asia and Africa and the Arab States regions. One of the key takeaways from that meeting was that the private sector sought demonstrated government commitment either through clear and strong policy frameworks to build trust among stakeholders and signal long-term commitment or through financial levers that reduced investor risk. This governmental commitment was not only important for funding partners, but also for long-term project partners who might have to make substantial investments (e.g. in infrastructure). However, the need for trust-building was also a two-way street – public sector participants voiced concerns with the profit-seeking motives of the private sector, which highlighted the importance of ensuring that private sector initiatives be fully aligned with the national sustainable development agenda.

⁷ Chile, Ecuador, Indonesia, Thailand and Viet Nam were included for Private Climate Finance Mapping when the so-called Enhanced Support of 5 million Euro was launched in April 2013

Box 3: National Outcome Chile

Huella Chile - Measuring Carbon Footprint in the public and private sectors in Chile

Huella Chile (www.huellachile.cl) is a free web-based platform managed by the Ministry of Environment that enables private and public sector organizations to use the same methodology for calculating their greenhouse gas emissions using international standards. At the end of 2016, there were 69 platform users and the calculations of GHG emissions of 35 local governments and public offices and 11 companies have been verified. Huella Chile, which adheres to ISO 14064, establishes an entrance for the private sector to contribute to Chile's compliance with international commitments.

During set up a pilot-testing was carried out with 43 companies from a wide range of sectors that provided feedback and recommendations for improvement. Thereafter, a series of trainings were conducted for different stakeholders approx. 900 people. A working group was created with the participation of over 10 verification organizations that had the objective of seeking agreements on the verification process and proposing actions to be integrated into the project. Huella Chile is integrated with the "Clean Production Agreements" (APL) and is used in various stages of APLs.

Through Huella Chile, the Ministry of Environment gives public recognition to the participants, which is highly valued by companies to give good publicity. "Logos" of recognition are issued for GHG quantification, reduction, neutralization and excellence in management. Up to December 2017 it had given 118 logos of recognition.

The Huella Chile methodology and process is a highly replicable product for the region.

Module 2.2: MRV systems to support and monitor mitigation actions created

As can be seen from table 9, 17 countries selected to work with the energy sector, 14 countries worked with the transport sector, and 12 countries selected waste. Thirteen countries worked within different industrial products and processes.

Under Module 2.1 the LECB Programme was improving capacity-building efforts in selected developing country industries in order to support industry to identify mitigation actions, facilitate carbon market access, level the playing field for sectors competing in global markets, provide incentives to technology cooperation, and create export opportunities for environmental industries.

Under Module 2.2, the LECB Programme contributed to private sector uptake of international GHG emission standards by fostering use of common and harmonised procedures to provide reliable, quality and comparable data and information on mitigation actions, results, and needs.

In the table below, selected country activities are mentioned to highlight the diversity and complexity of the activities supported as well as the background for the results achieved.

Table 9: Main private sector activities under Component 2 (MRV) compared to expected main activities

Expected main activities	Selected country-led activities
Module 2.1 Mitigation actions in selected private sectors established	
<i>Identify target sectors and mitigation potential.</i>	<p>Malaysia: review of the country's portfolio of CDM activities to identify the potential for NAMA. A study on NAMA potential in the cement and iron & steel sectors was also undertaken and presented to stakeholders at a workshop</p> <p>Argentina:</p>

Assess data collection capacity of private sector stakeholders.

- Mitigation measures were identified in the fertilizer and petrochemical sectors according to their economic effects, mitigation potential and co-benefits. Based on this and stakeholder consultations was prepared.
- Sector-based mitigation technologies were evaluated, and a cost-benefit analysis undertaken on the identified options
- Assessment of the whole industry sector's mitigation potential for compatibility with the INDC as part of the cornerstone of a new national climate change strategy

Analyse NAMA possibilities and applicability in the selected sectors

Argentina:

- Monitoring systems were analysed at pilot petrochemical plants to identify data improvement opportunities.
- Survey of the procedures used to calculate GHG inventories, and having analysed the monitored data
- Standardised monitoring plan for petrochemical plants that includes parameters such as the units to be reported, their origin, frequency of monitoring, and quality control processes
- Possibility to upload data from a given plant and have the GHG emissions calculated automatically

Egypt: A training was organised for cement companies on the use of a GIZ tool to estimate GHG emissions from the sector

Egypt: Development of sectoral studies, including proposed mitigation actions and an MRV plan for two fertilizer factories and two iron & steel factories, of which one is a public sector entity and one a private sector entity in each Sector.

Mexico: Comprehensive analysis on installing Combined Heat and Power (CHP) systems in 10 industrial facilities to participating firms, the chemical and mining associations engaged in the LECB process, government actors and UNDP.

Peru: The cement NAMA and an implementation readiness timetable were presented to stakeholders with a goal of working towards a legal agreement operationalizing a Cleaner Production Agreement (CPA). At least three national companies (Andean Cement Union, Cementos Inka and Cemento Nacional) plan to participate in the CPA.

Engage business associations and private sector actors to define the enabling environment to support low-emission goals

Mexico: To better understand private sector perspectives for the Combined Heat and Power (CHP) NAMA, the National Institute of Ecology and Climate Change, the business association and the UNDP participated in one-day visit to a DOW Chemical Company plant

Ghana: NAMA Investor Guide promoted by the Private Enterprise Federation to the business community and sensitise the private sector on investment opportunities in climate change mitigation

Colombia: Meetings were held with companies and trade associations to raise awareness about the Colombian Climate Change Policy, especially mitigation measures and forthcoming regulations and private sector instruments

Thailand: NAMA Net support focused on preparing a study on using energy crop as substitution for fossil fuels for Siam Cement and developing a "NAMA teaser" highlighting the business case for private sector cement companies to enter a NAMA framework.

The Philippines: Annual Business Summit on Climate Change held as part of the annual National Climate Change Consciousness Week Celebration

Enhance capacities to design and implement LEDS-framed NAMAs

Vietnam engaged the iron and steel sector through the LECB project by identifying four producers to participate in voluntary agreements to reduce GHG emissions and sign cooperation agreements. The enterprises then received technical support to assess areas for GHG reductions, identify site-specific technical solutions and formulate detailed mitigation action plans. The goal was to showcase the potential for financial savings associated with energy conservation in the production chain.

Mexico, two business associations, the chemical industries association and the mining association elaborated sectoral LEDS

Module 2.2: MRV systems to support and monitor mitigation actions created

Identify appropriate sector measurement tools and ways for the diffusion and use of these tools.

Argentina: A GHG inventory methodology and calculation tool for the petrochemical and fertilizer industries was tested, completed and validated at pilot “benchmark” companies. Monitoring plans for each sector were then prepared and presented to stakeholders. These efforts increased interest from firms in having standardized calculation procedures, follow-up systems and further trainings on the maintenance of GHG inventories.

Peru: A standardized baseline methodology proposed by the UNFCCC Regional Collaboration Center was explored for a NAMA for the brick sector.

Vietnam: Under NAMA Net a finance and MRV readiness assessment for chemical fertilizer and steel sector NAMAs was completed, focusing on the institutional structure of Ministry of Industry and Technology.

Build capacity to implement data collection frameworks and diffuse methodologies and guidelines for measurement and reporting.

Mexico: It is now mandatory for all facilities with annual emissions over 25,000 tCO_{2e} in the energy, industrial, transport, agricultural, commercial services, and waste sectors to report on direct and indirect GHG emissions. To support this reporting, a new electronic platform, COA-Web, has been launched.

Chile: The country has been scaling up voluntary reporting of the carbon footprints of businesses and industries through the carbon management Programme, Huella Chile. (See Box 3)

Lebanon: The country developed a simple reporting template ([Decision 99-1 - Greenhouse Gas Reporting Template](#)) to be used by businesses to voluntarily report GHG emissions in support of Ministerial Decision 99/1 (on CO₂ reporting). In order to encourage use of the tool, the Ministry of Environment created a Programme whereby firms that report and are certified are awarded certificates of recognition during an Annual Award Ceremony. Through an MOU with the Ministry of Industry, the LECB team reviewed, validated and certified the CO₂ emission reports of 41 commercial institutions in 2015 up from 32 in 2014.

The Philippines: Elaborated a GHG Inventory Reporting Protocol and Management Plan to support the business sector to produce high-quality, corporate-wide GHG inventory reports based on a common GHG inventory protocol, including a plan to reduce and manage GHG emissions that will be submitted to a reporting platform.

Communicate optimal data frameworks and reporting conditions to government bodies, the UNFCCC and international business peers

Peru: Training to firms that will participate in the cement NAMA on the proposed MRV system, which is based on the “Getting the Numbers Right” report of the Cement Sustainability Initiative of the World Business Council for Sustainable Development. Participating cement companies had already been sending data for the NAMA baseline. The World Bank Partnership for Market Readiness project, which will fund the NAMA in 2017, will provide further support on the MRV institutional framework and registration.

Engage business associations with governments to introduce a business-compatible MRV scheme

Chile and Ecuador are working jointly on the [private climate finance mapping](#) exercise. The international consultant contracted by LECB provided training to stakeholders and country teams in both countries. Chile selected to first conduct the public finance work and undertook scoping work in the renewable energy, grid networks, and mining sectors. Ecuador did scoping of small scale renewable energy, energy efficiency in buildings and transport/electric vehicles.

Indonesia: The scoping mission/training with the international expert and first stakeholder consultation were conducted with BAPPENAS, the Indonesia Climate Change Trust Fund (ICCTF) team, the Indonesian Business Chamber, Ministries of Finance and Industry, the International Finance Corporation, a USAID-ICED project, renewable energy developers, financing institutions (PT SMI, Bank Rakyat Indonesia), renewable energy and energy efficiency associations, and the Indonesia Global Compact. The energy, industry and forestry sectors were proposed for the scoping phase given the level of private investments and data availability.

Thailand: A national team undertook a preliminary scoping assessment of three sectors (renewable energy, energy efficiency in buildings and energy companies) that included

Build capacities for the private sector and facilities for monitoring, reporting and verifying GHG emissions for the prioritized NAMAs in selected countries and sectors.

institutional structure, policy framework, and data availability in order to analyse the government's private sector mobilisation mechanisms and formulate an approach for the implementation phase. LECB Project Board prioritised renewable energy as the focus for the implementation phase analysis due to data availability, least complexity and size of the market. A contracted company undertook the data analysis, which was finalised and endorsed in 2018.

Viet Nam: The private finance flows work is expected to contribute to on-going government efforts to improve access to green growth financing and pilot green projects to the private sector. The sectors prioritised for scoping were: renewable energy generation (wind, hydro, solar/thermal, solar/PV, geothermal), renewable and energy efficiency for agriculture (esp. fisheries and biogas); commercial sector and industrial sector (pulp & paper, cement); agriculture and forestry; and transport. The scoping revealed that governmental data does exist, but access requires direct engagement with departments within ministries and their provincial counterparts. The private climate finance mapping was officially endorsed in mid-2018.

Chile: The final MRV system was designed for the organic waste NAMA, consisting of a key component of awareness raising and capacity building among project partners in the waste sector.

Mexico: Contributing to the design of a national MRV system, extensive stakeholder consultation and mapping were conducted.

Viet Nam: The NAMA MRV sectoral assessment and gap analysis were presented in a training workshop; this included applying an MRV Readiness Test and resulted in drafting an MRV Assessment Report.

Lebanon: In support of developing the Monitoring Management and Quality Assurance System (MMQAS), consultations were conducted with key partners to conduct a sectoral assessment and gap analysis.

Results achieved in the area of private sector mitigation actions

Looking at the results of the private sector actions for mitigation, it is clear there have been widely different approaches in each country depending on the national approach to mitigation, the different sectors prioritised and the dynamics of the private sector. China opted for elaboration of a standard for low carbon products. Chile launched the voluntary carbon management program HuellaChile. Ghana did a NAMA Investor Guide to attract finance. Viet Nam conducted energy efficiency pilots in four steel production facilities. There is hardly any similarity between the approaches applied in the different countries. This goes to show that there is a wide range of approaches to reach the same goal of mitigation.

Table 10: Main mitigation achievements of the private sector

Country	Private sector mitigation achievements
1. Bhutan	<ul style="list-style-type: none"> Two (2) sectoral mitigation action plans completed (industry and cleaner production)
2. Chile	<ul style="list-style-type: none"> One (1) voluntary carbon management program (HuellaChile) designed and under implementation. By 2017, 320 private and public organisations had joined. 38 workshops held in 2015-16 for private sector actors on GHG emission calculations and management (731 participants) One (1) analysis of financial instruments to attract investment in energy sector
3. China	<ul style="list-style-type: none"> Low Carbon Product Certification Implementation Rules developed and piloted for 2 districts Low Carbon Product Standards and GHG Accounting Methodologies developed for 2 products
4. Ecuador	<ul style="list-style-type: none"> One (1) analysis of private finance flows
5. Egypt	<ul style="list-style-type: none"> One (1) mitigation action plan for fertilizer industry

6. Ghana	<ul style="list-style-type: none"> • One (1) NAMA investor guide prepared to attract private finance • One (1) business network launched for climate action
7. Lebanon	<ul style="list-style-type: none"> • Voluntary carbon emission reporting awards launched • Private sector GHG inventory reporting system via national annual income tax platform established • Technical support provided to Business Knowledge Platform • De-risking Renewable Energy Investments (DREI) analysis completed
8. Mexico	<ul style="list-style-type: none"> • Rules of operation prepared for National GHG Emission Registry • Feasibility studies conducted at ten (10) industrial plants for Combined Heat-Power systems
9. Peru	<ul style="list-style-type: none"> • Legal framework for cement NAMA implemented and cleaner production agreements agreed with target firms
10. Philippines	<ul style="list-style-type: none"> • One (1) private sector LEDS nearing completion • Private sector recognition awards designed & ready for launch • Business engaged through national and regional summits on climate change
11. Thailand	<ul style="list-style-type: none"> • One (1) survey of steel production data completed • One analysis of private finance flows in renewable energy sector underway
12. Vietnam	<ul style="list-style-type: none"> • Baseline audits conducted for fertilizer NAMA • Energy efficiency pilots conducted at four (4) steel facilities • One (1) analysis completed of private finance flows in renewable energy sector

3.3 Component 3: Support to elaboration of INDCs

For Component 3, countries were selected if they were not already receiving substantial financial or technical support from other donors or agencies for the development of their Intended Nationally Determined Contributions. Consideration was given to ensuring that approximately 50% of the countries in Component 3 were LDCs and/or SIDS. Elaboration of an INDC was voluntary for LDCs and SIDS. During COP 20 in December 2014, it was agreed “that special provisions would apply to LDCs”, i.e. that their INDCs “may communicate information on strategies, plans and actions for low greenhouse gas emission development reflecting their special circumstances”⁸. This meant that while the INDCs of developed countries were expected to include absolute or economy-wide emission reduction commitments, LDCs could draw on specific strategies, plans or projects to formulate their contributions, and specify the component of the contribution that would be conditional upon receiving international finance or other support.

A total of 26 countries⁹ were financially supported through the LECB for the INDC design process: Argentina, Barbados, Bhutan, Bolivia, Ecuador, Egypt, El Salvador, Ghana, Honduras, Indonesia, Lao PDR, Lebanon, Morocco, Nigeria, Paraguay, the Philippines, St Vincent & the Grenadines, Samoa, Sierra Leone, Solomon Islands, Suriname, Tanzania, Trinidad & Tobago, Uganda, Vanuatu, Zambia.

The contribution of the LECB was capacity building to enhance the opportunities for developing countries to prepare their INDC.

The LECB gave substantial support to the development of the INDC and advocated for countries to build on their LECB results and use the institutional framework and coordination mechanisms of the national projects when designing their INDCs. In fact, the countries to a large extent were able to build on the capacity created in the area of GHG inventories, NAMAs and MRV. In several countries, the NAMAs were directly integrated

⁸ CDKN – A guide to INDCs, second edition May 2015

⁹ The 26 countries include three countries - Argentina, Egypt and Lebanon - where funds from GIZ were provided for the elaboration of their INDC.

into the INDC; one example is Lebanon. LECB assisted the mainstreaming of gender into Bhutan’s INDC and in making the Indonesia INDC pro-poor. In Trinidad & Tobago, an NDC implementation plan was drafted with support of LECB. In general, the countries could also make use of the stakeholder platforms and processes established for the consultation on the draft INDC.

Main activities to enhance capacity of the public sector to elaborate INDCs

The expected main activities to support the elaboration of INDCs were quite specific and concise as can be seen in the left column of table 11 below.

Under Module 3.1, countries undertook a substantive review of existing national information in order to make critical decisions about the scope/content of their INDCs in a way that maximised both climate change and development benefits and fully embedded the INDC in the national development process.

The GSU, on behalf of UNDP, played a key role in cooperating with the UNFCCC Secretariat on arranging regional dialogues to exchange views on INDC preparation and later on NDC implementation.

In February 2016, the GSU conducted a survey of developing countries that had participated in the regional technical dialogues to gain greater understanding of capacity development and support needs post-Paris¹⁰ Fifty-eight countries responded. The survey found that the main challenges going forward were:

- Converting plans and goals outlined in INDCs into concrete actions
- Building institutions and systems to manage NDC implementation
- Costing and mobilising resources to implement climate change measures. Awareness raising was also seen as an important necessity to maintain momentum

Countries are at different stages of NDC implementation and, for many, continued support from the international community will be critical during this process.

Table 11 below presents a few selected country examples from the LECB support for INDC elaboration. A variety of document reviews, scoping reports, stakeholder consultations, breakfast meetings, and data analyses were carried out in the 26 countries with national resources and LECB support.

Table 11: Main overall activities of the EU Action Document and Specific country activities

**Main activities of Comp 3: Selected Country-specific activities
Capacity building to INDC**

Module 3.1 Countries supported to undertake substantive review of information in order to make critical decisions about the scope/content of the INDCs

Prioritise sectors to include in INDC

The Philippines applied a multi-criteria analysis to prioritise mitigation actions for the sectors solid waste, transport, energy, wastewater and forestry. A long list of mitigation options was developed, which were eventually considered in the INDC. With support from the LECB project, the approaches for achieving the national mitigation goal (i.e. 70% emission reduction from business-as-usual (BAU) were agreed by the relevant authorities.

Vanuatu held preliminary meetings with relevant National Communications' thematic working groups to identify the key GHG-intensive sectors and agree on institutional arrangements for the preparation, implementation and monitoring of the INDC. In addition to the national communication, data and information from other relevant

¹⁰ <https://www.undp.org/content/undp/en/home/librarypage/climate-and-disaster-resilience-/country-needs-support-for-implementation-of-nationally-determine.html>

sources were reviewed to identify and prioritise key sectors. Stakeholder consultations, including with private sector and civil society, were then held to choose and finalise the mitigation and adaptation contributions for Vanuatu's INDC. A national stakeholder validation was organised prior to submission to the UNFCCC.

Analysis for **Honduras'** INDC was undertaken by an international consultant with support from UNDP and the national LECB team. This included prioritisation of sectors based on national capacities and mitigation potential, reconstruction of GHG inventories building on the available information, opportunities for funding and national circumstances. A total of eight scoping studies and two summary reports were prepared during the design process, and 20 bilateral meetings conducted. There were also two national workshops and four sectoral capacity building workshops organised engaging public servants and representatives from more than 30 government institutions in the context of preparing the INDC. The workshops were important to raise awareness, particularly of key ministries. After approval of the Inter-institutional Climate Change Technical Committee, a high-level presentation of the INDC was made prior to its submission on 30 September 2015.

In **Nigeria**, a national stakeholder workshop was organised to kick start the INDC design process followed by six technical expert consultative workshops. Two scoping studies and three summary reports were developed as inputs to these consultations, drawing upon information in the national communications, national development strategies, and policy documents and data from ministries, departments and agencies. A high-level inter-ministerial breakfast meeting was held to seek approval for the INDC prior to submission on 27 November 2015. One important aspect of the INDC was ensuring strong alignment with national priorities and the sustainable development agenda.

Colombia: The LECB Project supported the development of (Sectorial Mitigation Action Plans) SMAPs for Mining, Hydrocarbons, Electricity, Transportation, Waste, Housing, Industry and Agriculture. The SMAP process was the first effort for sectorial engagement in mitigation action in Colombia. These plans played an important role in allocating responsibilities for the INDC and are now called "Sectoral Mitigation Implementation Plans".

Propose type of INDC

In **Bhutan**, two rounds of stakeholder consultations were held in July to agree upon the main elements of the INDC, which was submitted on 30 September. The INDC reaffirms the government's commitment to remain carbon neutral and sets out intended measures to achieve this goal, including promotion of low-carbon transport which has been supported by the LECB project and World Bank.

Given the information available in **St. Vincent and the Grenadines**, an outcome-based target was used and applied to a business-as-usual scenario target (2025) taking into account economic and population growth projections. The contribution was applied on an economy-wide basis to provide further transparency and demonstration of ambition. The National Social and Economic Development Plan 2013-2025 was the core document for setting national priorities on climate change and the INDC is driven by non-climate related impacts that support developmental priorities – in particular, reduced spending on imported fossil fuels. Extensive consultations (11) were held with key stakeholders during the preparation of the INDC to gain buy-in, identify information sources and validate the final document prior to submission on 18 November 2015.

To set targets, **Indonesia** reviewed a number of key policy decisions including, a moratorium on the clearing of primary forests and by prohibiting conversion of peat lands from 2010-2016, a mixed energy use policy in which at least 23% of the energy matrix must come from new and renewable energy by 2025 as well as a national policy directive on the development of clean energy sources, and a commitment to further reduce emissions in the waste management sector by 2020.

Select reference point for INDC

DRC., the **LECB national team** was closely involved in the decisions and analysis to put forward a fully conditional INDC on 18 August 2015 with a **baseline scenario** target of 17% emissions reduction by 2030 within three prioritised sectors (LULUCF, agriculture and energy). The LECB project coordinator and the LECB senior expert on LEDS also participated in COP 21 as two of the five lead negotiators for DRC.

Quantify expected GHG emissions reductions

Indonesia: A base year of 2010 for the business as usual scenario was selected based on a historical trajectory (2000-2010). Assumptions for the 2020-2030 scenario are: 1) long term economic growth will still be influenced by land use governance, energy consumption tenure issues, and quality of infrastructure connecting the archipelago; and 2) sector behaviour and economic growth can be primarily attributed to GDP per capita, population growth, energy intensity, value added, and increasing domestic and international demand for natural resources based commodities.

Tanzania: Estimates for the mitigation scenario elaborated based on the national power master plan and national development plans and priority activities were then presented by stakeholders. It was estimated that Tanzania can reduce GHG emissions by 10-20% by 2030 relative to the business as usual scenario of 173 Mt CO₂e by 2030 but this is dependent on availability of financial resources.

Peru: With technical assistance from the UK Department of Energy & Climate Change (DECC) used DECC's "2050 calculator" to develop simulation models for different emission scenarios for Peru's INDC, drawing information from PLAN CC. The INDC, included an unconditional target of a reduction by 20% in GHG emissions below BAU by 2030 and a conditional target of a 30% reduction relative to BAU levels by 2030. Colombian experts also provided Peru with training and guidance to Peruvian experts, with DECC support, due to their experience.

Samoa: After engaging stakeholders to define priorities, information on current and future GHG emissions, current mitigation actions, and mitigation potential of additional actions and their costs was collected in order to formulate and quantify expected GHG reductions for the energy sector. Key documents were the Energy Sector Plan 2012 – 2016, Electricity Act (2010), Greenhouse Gas Abatement Strategy, Climate Change Policy (2007) and the draft Energy Efficiency Act. The INDC was prepared using the 2006 IPCC guidelines and the GHG inventory was updated using the latest available data. Key assumptions and drivers were drawn from the Second National Communication (2009) for business as usual projections, based on continuing economic and population growth with no GHG mitigation measures. Samoa used a consultative process to design the INDC that included key energy and climate change governmental entities and NGOs.

Determine non-GHG benefits

Morocco: Organised the first Global Forum on Alliances and Coalitions Post-Paris on 20-24 June 2016 that included a panel discussion on the link between voluntary initiatives, NDCs and Sustainable Development Goals.

Suriname: four non GhG benefits identified: natural mangrove regeneration leading to increased fish production, apiculture, increased tourism and reduced poverty levels.

Lebanon: As part of the celebration of the UN's 70th anniversary in on 21 October 2015, the LECB team organised a discussion panel on synergies between climate change and sustainable development moderated by a prominent environmental journalist.

Assess feasibility of proposed contributions to ensure realistic and achievable INDCs.

Sierra Leone: The INDC preparation process included a review of the existing relevant policy and regulatory framework to identify gaps. A recommendation has been made for a national climate change Act. INDC priorities will also be integrated into the national development priorities. Post-Paris, a workshop was conducted for parliamentarians in April 2016 to increase their knowledge on climate change issues and especially the Paris Agreement. One major outcome of the workshop was a decision to launch a Climate Change Advocacy Network at Parliament to ensure that all necessary laws and regulations are fast-tracked and passed as legislative tools for effective monitoring of the country's low carbon and climate resilient efforts.

Costa Rica: The final draft of the INDC was presented to national and international experts, including World Bank and UNDP, in September, prior to submission on 30

September 2015. The LECB transport and agriculture experts were involved in the INDC preparation, supporting the Ministry of Environment and Energy.

Uganda: The LECB project supported several stakeholder consultations to agree upon the elements of the INDC, and then three regional stakeholder consultations to discuss and validate the proposal prior to submission.

Suriname: Hosted a national Climate Change Conference on 11 November 2015 in advance of COP 21, supported by UNDP and LECB, to raise awareness on the INDC.

Results achieved on elaboration of INDCs

All countries receiving support from LECB submitted their INDCs to the UNFCCC and signed and ratified the Paris Agreement.

The table below shows activities related to the INDC and/or elaboration of the NDC that LECB supported post-Paris. To note: Chile, Colombia and Moldova received INDC support through other funding sources but benefitted from the technical capacity support provided through the GSU.

Table 12: I/NDC implementation results under the LECB Programme

Country	I/NDC design and implementation
1. Argentina	<ul style="list-style-type: none"> National Cabinet for Climate Change enforced (19 national ministries, local governments, private sector, civil society, academia, and NGOs) National NDC dialogue with representatives from all Provinces 26 training workshops at subnational level to enlarge participation on mitigation actions to support NDC implementation
2. Chile	<ul style="list-style-type: none"> One (1) Climate Public Expenditure and Institutional Review to better track public budget expenditures on climate change
3. Colombia	<ul style="list-style-type: none"> Technical analysis on sectoral prioritisation of measures for compliance with NDC. Roadmap for valuation of organic waste
4. Ecuador	<ul style="list-style-type: none"> One (1) Climate Public Expenditure and Institutional Review to better track public budget expenditures on climate change
5. Ghana	<ul style="list-style-type: none"> NDC Progress Aggregator designed to track the NDC implementation progress
6. Lebanon	<ul style="list-style-type: none"> Management Information System on Climate Action (MISCA) developed and launched for tracking progress of NDC goals (in collaboration with EU-ClimaSouth) One (1) NDC roadmap and implementation plan prepared
7. Moldova	<ul style="list-style-type: none"> Support for signing of Paris Agreement and draft Law on ratifying Paris Agreement
8. Philippines	<ul style="list-style-type: none"> One (1) NDC roadmap and implementation plan nearing completion
9. Trinidad and Tobago	<ul style="list-style-type: none"> One (1) NDC roadmap and implementation plan prepared

3.4 Challenges to implementing the LECB Programme

The country-driven nature of the LECB Programme resulted in many positive outcomes such as high-level buy-in, retained institutional knowledge, and increased awareness of mitigation actions among policy and decision makers alike. However, the LECB Programme also encountered some common challenges during the implementation of the Action related to its coordination with government institutions. Firstly, various countries mentioned that the start-up phase took longer time than foreseen. Due to administrative procedures and political decisions of government institutions, several country programs were delayed in the beginning. This challenge was overcome by applying certain flexibility to the LECB implementation such as adjusting timelines and extending national projects.

In many countries, **elections, new governments, reshuffling of ministers and job rotation and changes in leadership led to disruptions in the flow of implementing activities**. On the one hand these changes are part and parcel of working with the public sector, and there are also ways to work around it. During the course of implementation, LECB increasingly **worked with existing institutions rather than individuals** and this tended to create more stability because institutions usually last, but individuals are often rotated to other functions. At the same time, one of the successful approaches applied was to identify **champions** in the institutions that could contribute to build motivation and ownership and speed up implementation. Both approaches had its advantages and disadvantages, so to find the right mix was very context dependent.

The LECB Programme was initiated at a time when many countries i.e. Kenya, Uganda, Tanzania had just completed their National Climate Change Plans (NCCP), which was a good stepping stone for working further with mitigation as the NCCPs addressed both adaptation and mitigation. However, adaptation and disaster risk reduction in general figured much higher on the political agenda, e.g. in Philippines (See Box 4), so it was a challenge to create awareness about the countries' responsibilities and opportunities to contribute to mitigation and the available mitigation options. Other countries e.g., Lebanon had an influx of refugees on top of its political agenda. **The different and often opposing political agendas** in combination and often associated with the changes in government required intense stakeholder consultations in order to secure full validation and ownership of governments.

Box 4: National Outcome
National Climate Change Mitigation Framework Strategy and Mitigation Goal in Philippines

Climate adaptation ranked higher on the Government's agenda as compared to mitigation, given the Philippines' vulnerability to climate change impacts. The LECB Programme therefore had to put in significant effort to fully engage the ministries on climate mitigation. There was a concern that the elaboration of NAMAs would give further prioritization to mitigation. The project design was thus adjusted to focus on the preparation of a mitigation strategy, which involved a holistic approach to weighing in socio-economic benefits.

This document includes guiding principles, a national mitigation action plan, an institutional framework, an MRV system (including key performance indicators for benefits and impacts), and a capacity building needs assessment and action plan.

Added to these challenges was the **limited time and resources in government institutions** to participate in the project. As the Kenya Country Summary points out: *“Technical backstopping, Technical Working Groups, UNDP GSU were short term approaches to fill gaps in relation to time and resource short falls”*. In some cases, the shortfalls were exacerbated by serious fiscal constraints, e.g. in oil producing Trinidad and Tobago that saw its revenues plummet because of the drop in world oil prices in 2015. These fiscal constraints made it considerably more difficult for the national governments to contribute to the implementation of activities. Despite these shortfalls, a high number of countries report the creation of internal technical and expert capacity on mitigation, NAMAs, and GHG inventories, the existence of dialogue between ministries and cross-sector working groups and connections between public and private sector as some of the results that will remain on after the Programme closes. To address the challenge of limited time and resources in government institutions the Programme developed the NAMA Net component (reflected in budget as *Regional Centers of Excellence/International Consultants*) to provide more technical assistance and backstopping than previously planned for, both at the national level and the international level (see 4.2 *Changes introduced under implementation*, pg. 38). This was an intervention that was foreseen and included in the inception of the Programme, but the flexible budget allowed for more support to be offered to countries that were in more need.

Coordination between various institutions, donors, the private and public sector was a common challenge due to differing agendas and lack of coordination mechanisms. Again, the flexibility and cross-sector nature of the LECB Programme helped considerably in establishing good cooperation and working relationships both between donors and between public sector institutions.

This is also linked to the topic of hiring and involving **international experts** for the implementation of the Programme, which was seen as a limitation to the capacity building of national partners. In some cases, the difficulty was to guarantee a proper hand-over of the work done to the institutions as external technical experts only delivered the product without the accompanying documentation of the working process and applied methodologies. Because the mitigation topics were new and therefore there was a lack of internal expertise in the public institutions or in the private sector, there was a necessity to use external national experts or international experts. However, it is noted that this is not the ideal scenario and the transmission of their knowledge to the institution or private companies, when achieved, was considered a very positive outcome. This was the case in Zambia, which collected data with international consultants resulting in enhanced internal capacity. In Lebanon, an international firm was hired in collaboration with a national firm to complete the Derisking Renewable Energy Investment (DREI) analysis and exercise. This model allowed both firms to learn from each other (context and contacts from the local firm and technical expertise in the field from the international firm) and for the capacity developed to remain in the countries.

As it could be foreseen, there was a special challenge regarding the mitigation agenda launched by the LECB Programme. Some countries in particular the LDCs had little awareness of mitigation and low emission pathways and there was no clarity on the need for embarking on these pathways. Some countries like the Philippines prioritised adaptation over mitigation. This type of risk was already considered high in the Action Document Risk Analysis and could also be seen as one of the *“raison d’être”* of the LECB Programme as such. The approach to address this challenge was to conduct extensive stakeholder analysis, capacity building exercises that allowed for unique national outcomes (See Text boxes) in order to **secure the buy-in to the mitigation agenda** from the national governments as well as the private sector. Countries like Peru, Mexico, Costa Rica, Vietnam, China and Indonesia had already begun their low emission pathway a few years earlier with support from e.g. the EU, US EPA or GIZ. In these countries, when there were mitigation opportunities in countries, it was easier to launch LECB activities and create results.

In some countries, language was a challenge, either because most capacity building materials were only available in English or, as was the case in China, that all written material was in Chinese. In the latter case, the GSU collaborated with the UNDP Country Office to overcome language barriers and translate to English so that the GSU was able to accompany the development.

Challenges encountered regarding support to setting up GHG inventories

Throughout the Programme many countries reported various challenges that were encountered in the development and improvement of national GHG inventories.

Knowledge is power and **data collection**, compilation and analysis generates knowledge. It is therefore not surprising that the issue of **data availability** and access appeared in almost every country. Firstly, in many developing countries there is not a consolidated practice of collecting environment-related statistics and the technical capacity to do so is limited. Hence, data is often related to specific (donor-funded) projects, geographically limited, or outdated, (e.g. forestry data date back to colonial times in some countries). The Programme helped to address this issue through focusing on the development and strengthening of the GHG

emissions data collection systems in the majority of countries. This included supporting countries to systematize and institutionalize their data collection process.

Secondly, there can be mistrust regarding the use of data and confidentiality also associated to the issue of accountability towards a wider audience. Thirdly, the level of influence of Ministries of Environment (the key government partner in most LECB countries) is limited, complicating data collection from other ministries. And, finally, several countries were concerned with the threat that reliable GHG inventories could pose for economic development, especially if this development is based on exploration of oil and gas. Points two through four were mitigated by the Programme focusing specifically on the development of institutional coordination mechanisms in-country that helped to build trust and familiarity with the process, enabled the production of MOUs between ministries and third-party data providers and build awareness on the use of the data while simultaneously building trust. Accurate, systematized and institutionalized GHG inventory systems was always prioritized and considered a critical foundation for other Programme components.

Although a few countries made considerable progress on establishing reliable GHG reporting system and strong MRV frameworks (e.g. in Uganda), that requires capacity building to use more advanced tools for emission scenarios, such as Long-range Energy Alternatives Planning (LEAP). However, it remains a considerable challenge to maintain interest in providing the underlying data for mitigation action that are reliable and make the basis for securing funding for the low emission pathway.

Box 5: Legal framework and feasibility studies on cogeneration can pave the way for energy efficiency in Mexico

The 2015 Energy Transition Law requires Mexican industries to increasingly consume clean energy. The regulation allows for a certain percentage of the energy generated by efficient combined heat and power (CHP) systems to be considered clean energy.

A NAMA focused on CHP for mid-sized industries in the chemical and mining sectors. Ten feasibility studies were elaborated at different industrial plants to evaluate the viability of installing cogeneration systems to achieve greater energy efficiency in their processes and reduce GHG emissions. The feasibility studies demonstrated that CHP systems are achievable and profitable, with an average internal rate return of 23%, and at the same time reduce GHG emissions by an average of 16%.

The studies also showed that installing cogeneration systems in mid-sized industries is profitable and achievable by overcoming certain barriers such as reducing uncertainty over timeframe for investment returns. As a result of the feasibility studies, a Forbes 500 company – Dow Chemicals – changed its mindset through this bottom-up approach and showed interest in installing cogeneration systems in 2 of their 3 plants in Mexico.

However, some important barriers prevented adoption, including: insufficient availability of natural gas; difficulties in obtaining approvals and permits to install new generation equipment and connect to the grid; lack of technical knowledge by plant managers; and lack of access to investment finance.

Although countries successfully set up their GHG inventory systems with word templates or databases, it remains a significant challenge to ensure that key institutions will be able to maintain and regularly update the **GHG inventories** in the future. The LECB Programme sought to reduce this risk by providing examples of MOUs for ministerial coordination to national teams and guiding the countries to include descriptions of the institutional arrangements and coordination efforts established under LECB in National Communications to create greater ownership and legitimacy of efforts.

Challenges encountered in developing NAMAs

In general, and in particular regarding NAMAs because of the financial aspect, it was important to **secure the buy-in both at the technical and policy level**. In some cases, the technical level in the ministries was fully engaged, but when it

came to promote the NAMAs, the engagement among the decision-makers was weak or absent.

It was also often a challenge to ensure the interest of the private sector with high emissions in the elaboration of NAMAs. The private sector **perceived NAMAs as enormously risky** because there was rarely a commitment from the Government to establish the right framework for investment, such as putting in place financial and administrative incentives for the private sector to mitigate GHG emissions. The case in Box 5 illustrates that even with a favourable legal framework and reasonable returns on investment, there can still be a number of challenges to overcome before private companies make an investment decision.

Once the private sector became engaged there were challenges with establishing effective cooperation because of **differences in working culture**, with lengthy decision-making processes in the public sector and more swift processes in the private sector. Occasionally, the private sector lost interest waiting for processes to move.

The **technical requirements** to elaborate a detailed NAMA can be very complicated and vary from sector to sector. Although many NAMAs related to the energy sector, many other sectors were also covered and within these there were highly specialised areas such as cement production, steel production, and peat swamp management. There was limited expert capacity on mitigation in general in the sector ministries as well as limited specific technical knowledge on the different sectors and sub-sector areas. As mentioned under the GHG inventory it also took an effort from LECB country team and core partner to establish cooperation between the different sector ministries. The limited knowledge was mirrored by limited knowledge in the private sector on conceiving and implementing the NAMAs. This was of course foreseen by the Programme, which was specifically established to build capacity, and subsequently the focus was on capacity of the public sector under Component 1 and the private sector in Component 2.

The biggest challenge related to NAMAs was to **secure funding** for their implementation. As can be seen from table 6 that very few of the 47 detailed NAMAs that have been elaborated have obtained funding and are under implementation. The NAMA Facility rejected NAMA funding applications for various reasons, e.g. for not including private sector sufficiently, for not leading to transformational change, for not having enough leverage, and also due to governance-related weaknesses. Other important limitations were the lack of national capacity on financing and delays in seeking endorsement for co-financing, which is a prerequisite for obtaining NAMA Facility financing. Table 4 gives an indication of the effort that went into elaborating NAMAs but also that the activities directed towards financing had limited success. One big lesson learned from the process is that financing should be integrated from the beginning into the elaboration of the NAMAs and that partnerships with financial institutions should have been established earlier.

Associated to the financing constraints came the “NAMA fatigue” meaning the countries partners became somewhat tired of continuing to put effort into elaborating NAMAs when financing was not obtained for implementation. The GSU applied different tools, such as marketplaces, direct technical support, and presentations to financing institutions to obtain funding.

Top-down approach in NAMA Net support

Some, but not all, LECB national teams felt insufficiently consulted in the development and procurement of NAMA Net, and as a result, the ToR for the NAMA Net consortia were either not fully in line with LECB national projects or inadequately responded to the reality and needs of the countries. For example, in Chile the focus of NAMA Net support was on developing MRV for a specific NAMA (waste), but LECB Chile was not engaged in individual NAMAs, but in setting up the general framework systems for NAMAs. In Indonesia, the consortium’s ToR were to help the country with NAMA identification, but Indonesia had already NAMA identification tools established, and the Government did not find the NAMA Net support relevant. Moreover,

in some cases, the countries were not at the anticipated development stage, and the consortia had to wait for extended periods of time until the country had the necessary information and structures in place, e.g. some NAMAs lacked details necessary for the consultant's work on the NAMA financing, and in some countries the national consultants had not yet been recruited. As a result, NAMA Net implementation was behind schedule in many countries. In a number of countries, the consortia in dialogue with the countries and GSU reoriented the focus to respond better to the national needs and stage of development, such as focusing on supporting NAMA design instead of, or in addition to, MRV system design, although a challenge was that such activities were not budgeted for in their contracts.

Challenges encountered in developing MRV systems

The challenges related to the development of MRV systems were interrelated to some of the challenges mentioned in relation to GHG inventories and NAMAs such as availability of data and systems to regularly collect and analyse data and thus directly mitigated through the measures mentioned above, such as tailored support to strengthen and institutionalize data collection methods and adoption of robust institutional coordination mechanisms.

Challenges encountered in the elaboration of INDCs

Apart from the general lack of available relevant data, no particular challenges related to elaboration of the INDC were found.

4. Programme management, technical support and monitoring

This chapter presents the main features of the overall progress of the Programme, the technical support delivered, and the monitoring carried out.

4.1 Management of the LECB Programme

The Global Steering Committee comprised UNDP and the donors and provided overall strategic guidance for LECB implementation. UNDP's Global Support Unit was responsible for overall management of LECB, liaison with donors, technical support and guidance for the LECB national projects. The UNDP country offices were responsible for the administration and implementation oversight of the national LECB projects.

At the national level, there was a National Project Steering Committee in each country to govern the LECB national project. They comprised representatives from national governments, key non-government stakeholders, the UNDP Country Offices and donor representatives. To facilitate day-to-day implementation of the LECB national projects by the national governments/national teams, UNDP Country Offices contracted National Coordinators, many of whom, by design often sat within the Ministry of Environment. Moreover, core teams of government staff and consultants responsible for implementing the activities of LECB national project were in place. Nine consortia of consulting firms were contracted to provide targeted technical support on NAMA design to LECB national projects. This support measure, coined "NAMA Net" became operational since early 2014.

In the beginning 15 countries were covered by support from LECB and this number increased to 38 in the beginning of 2015. The scope of work varied by country and while some participating in all 3 components, others only took part in component 3. The increase in the number of beneficiary countries and the addition of activities and not the least the addition of Component 3 in 2015 on support to elaboration of INDCs, required a high level of adaptive capacity by the GSU and also staff increases. The GSU aimed at adapting the skills and knowledge to the new requirements.

UNDP was at the time implementing a large portfolio of projects related to mitigation at all these levels. This provided a unique opportunity for LECB to benefit from other UNDP actions. The GSU collaborated with the UNDP-GEF Unit on the provision of technical support and on keeping abreast on the developments in the regions and LECB countries. Through this collaboration and coordination, it was better ensured that overlaps between projects were avoided and possible synergies were capitalised upon.

During implementation the UNDP GSU elaborated four formal reports to the European Commission:

- LECB Progress Report, December 2010 – June 2012
- LECB Progress Report, July 2012 – June 2013
- LECB Progress Report, July 2013 – June 2015
- LECB Progress Report, July 2015 – June 2016

Furthermore, quarterly reports were elaborated throughout the Programme and delivered to the global steering committee.

The first 18 months of the implementation period was used to complete the inception phase, identify country needs for capacity building, develop national level programme action plans and documents and hire national level staff. There were some delays compared to the initial implementation plan.

From 2013, the country project had been defined and the Programme was well underway. Most countries had made major advances in project implementation and were delivering a range of technical outputs that were fully “owned” by national stakeholders. From 2015 with the new component 3, the GSU was actively engaged with Programme countries to ensure that these outputs were used as inputs to the INDC design process.

Through 2015 and 2016, the LECB Programme continued to assist developing countries to strengthen capacities to bring about low-emission development. The structure with five modules and country-driven focus of the Programme were strengths that allowed the Programme to adapt to the emerging needs of participating countries, including their responses to key decisions of the UNFCCC. This was evidenced by the incorporation of a new Programme objective in 2015 to support the preparation and implementation of INDCs.

4.2 Changes introduced under implementation

The LECB Programme annually assessed the risks identified in the Action Document and looked to ways to reduce the risks that might affect the success of the LECB Programme. It was found that the risks did not change over the implementation period, so there was no need to make changes to the Programme on that account. However, there were several other major changes during the implementation period.

Initial adjustments

South Africa and Brazil were initially selected but did not join the Programme, so they were substituted by Indonesia and Argentina, which were selected because they also had a relatively high level of emissions in industrial sectors.

Financial support from the Australian Government

Due to additional funding from the EU and from the Australian Government it was possible to increase the beneficiary countries from 15 to 25. The expansion of the Programme enhanced its global nature and gave a greater regional balance. The wider set of countries also gave a broader set of experiences and lessons. The expansion responded to demands from developing countries to be involved in the Programme.

At the same time, the implementation period was extended from 48 months to 60 months i.e. to the end of 2017 to allow the additional ten countries to plan and implement their activities. These changes were agreed in Amendment no 1 to the initial EU agreement to Contribution Agreement EuropeAid/DCI-ENV/2010/243-093/TP.

The donor group now comprised two donors i.e. Germany and Australia apart from the EU and UNDP, so the Steering Committee decided to change the title “EU-UNDP Climate Change Capacity Building Programme” to “Low Emission Capacity Building Programme” which better reflected the new reality.

NAMA Net

NAMA Net was launched in February 2014, since the GSU and donors realised that the LECB national projects needed more capacity development support than that the GSU and existing national project funds could provide to tackle the challenges of detailed NAMA development. This was also exacerbated in some countries by more limited availability of government institutions (see *Challenges to implementing the LECB Programme*, pg. 32).

The support from the EU was increased with 5 million Euros (Amendment no. 2) at the end of 2012. These funds were among other things allocated to enhance NAMA Net. Seven NAMA Net consortia were contracted to give technical support to the countries in three key areas of NAMA design: scenarios and sustainable development impacts; finance; and MRV systems.¹¹

The objective of NAMA Net was to bridge the gap between the original LECB project outputs, which were mostly focused on NAMA concept development, and the financial and technical diligence required for detailed NAMA proposals that are seeking to attract investments. The support ultimately provided under NAMA Net was further tailored in all cases to address different capacities and government needs. While the support in all cases has been useful, some countries – especially LDCs – could have benefitted from more intensive support. Furthermore, in most cases, there continued to be challenges in designing NAMAs that were attractive to the private sector or recognised the need to improve the broader enabling environment for investors using both policy and financial levers. Two consortiums developed detailed NAMA budgeting methodologies, including Excel tools.

Enhanced support

LECB received 5 million Euros from Germany to provide so-called Enhanced Support to select countries. The Enhanced Support facility was launched in April 2013. The support was particularly directed to overcome barriers related to institutional weaknesses in the public sector regarding the decision-making and institutional processes to mainstream climate change actions, approve budgets, disburse resources, execute activities, monitor performance, and report results. It was found that problems were related to quality and effectiveness of execution rather than budget constraints. Building up and supporting centres of excellence i.e. the NAMA Net consortia contributed to address institutional, technological and capacity gaps in the areas of MRV, NAMAs and climate finance readiness for countries. In this completion report the Enhanced Support is not treated as a separate component but as integrated in the three existing components.

¹¹ The companies/consortiums were: 1. DNV KEMA, 2. Ernst & Young (India), 3. Kommunalkredit (lead) with Climate Focus, Germanischer Lloyd GmbH, Instalaciones Inabensa, 4. NIRAS (lead) with CarbonBW Colombia, Perspectives GmbH, 5. Carbon Partners Asiatica; 6. Grue + Hornstrup (lead) with First Climate and Adelphi, 7. POCH Ambiental S.A. (lead) with Factor CO2 Integral Services S.L. and Perspectives GmbH, 8. Grue + Hornstrup (lead) with TUV-NORD and KyotoEnergy, and 9. Grue + Hornstrup (lead) with TUV-NORD and First Climate.

The Mid-Term Evaluation (MTE)

The six overall recommendations from the MTE were grouped into two categories, namely a) those that be incorporated as adjustments of the on-going LECB Programme and b) those that were integrated in NDC Support Programme. For those countries that were not selected to continue in the NDC Support Programme there was a focus on implementing an appropriate exit strategy.

From 2016 there was an increased effort from the GSU and the national project coordinators to tailor the NAMAs to the requirements of different potential donors in order to facilitate financing and the government institutions were encouraged to always inform their partners of the NAMA and mitigation actions. There were also a number of initiatives to involve the private sector companies in the NAMA design process from the beginning.

Regarding technical support and knowledge management, the LECB Programme opted for setting up regional clusters and knowledge sharing platforms to facilitate discussion between countries elaborating and implementing NAMAs. Also, databases with all documentation were created as well as with lists of experts in different sectors.

The recommendations on strengthening the result and outcome indicators in the Monitoring and Evaluation System (M&E) were integrated in the development of the new NDC Support Programme.

Capacity building to elaborate INDCs

The objectives of the Programme were expanded through Amendment no 3 (signed on 16 June 2015) to incorporate a third objective to build public sector capacities to prepare INDCs, which was a key component for reaching the Paris Agreement. In addition to nine existing LECB countries that will undertake this INDC work, 13 new countries have also been included to undertake Component 3.

Since all developing countries have made INDC preparation their highest priority in 2015, it was agreed with donors to extend the end date of the Programme by one year from 15 December 2016 to 15 December 2018 to ensure that LECB countries have sufficient time to complete all their other deliverables described in the national project documents, since in many cases there are unanticipated delays as a result of the INDC preparation.

Collaboration with the Project for Market Readiness (PMR)

Given the similarities in scope and ambition, and the fact that both the LECB Programme and PMR are EU flagship programmes the two programmes made a concerted effort to find synergies where possible and avoid any duplication. PMR personnel were invited to and attended 2 global LECB meetings, informal calls were conducted between World Bank programme management and LECB programme management, and UNDP agreed to serve as the implementing agency for PMR in both Peru and Indonesia resulting in national project staff working together on respective project outputs.

4.3 Technical Support

To support the country projects, the Global Support Unit carried out a large number of diverse activities including global annual meetings, thematic meetings, management of detailed technical support from NAMA

Net, newsletters, knowledge products, knowledge exchange, etc. The country support responsibility was originally divided on a regional basis, but since the countries in Africa generally needed more support than countries in Latin America and the Caribbean or Asia and the Pacific, the regional division of responsibility was abandoned; this also enabled the GSU staff to better bring lessons from one region to other regions. Acknowledging that it is not feasible for the GSU to provide support for all countries on all technical issues, the GSU focused on specific Programme aspects, such as NAMA Net and financial flows.

The GSU carried out 81 technical visits to assist the countries with defining and implementing their country projects. The number of visits to each country depended on the dynamic of the public institutions and the private sector and the expressed demand of the individual countries but also on the capacity of the GSU to carry out these visits. The seven NAMA Nets were the main sources of technical support regarding the elaboration of NAMAs.

An important activity of the GSU was to develop, or engage experts for the development of, knowledge products (e.g. good practice analysis on LEDS, NAMAs and MRV) and guidelines (e.g. on NAMA design, INDC design, and LEDS process facilitation). Several such products were produced and made publicly available on the LECB website. The products typically take departure in the concrete results and lessons learned in the LECB countries. (See table 13 below)

Another central activity of the GSU, and one that was particularly appreciated by national teams, was the provision of opportunities for LECB countries to interact, share experience and learn from each other. Sharing was promoted through a number of channels. The most prominent were the Annual Global Meetings where all LECB national teams were brought together with the GSU, LECB donors and selected guests (e.g. from the UNFCCC Secretariat). Moreover, the GSU arranged global and regional workshops on key topics (e.g. on INDCs, GHG inventory systems, private sector engagement). The opportunities for sharing were highly appreciated by national teams, who found that the Annual Meetings and workshops covered important subjects and new/emerging themes. (See table 13 below). 700 people from country teams and development partners participated in the seven annual global meetings. 532 people participated in the ten thematic meetings held. Two thematic working groups convened in 2015 and 2016, respectively on waste sector NAMAs (in collaboration with the International Solid Waste Association (ISWA) and mapping of private climate finance flows. A cost-effective way of knowledge sharing, and general technical support were the 34 webinars organised on topics such as GHG inventories, the basic of NAMAs and good practices.

Knowledge, information and news were also shared via electronic newsletter, *the lowemissiondevelopment.org webpage* and also via nationally created webpages. Thirty LECB Monthly Round Up emails were published, featuring 77 country articles as well as six quarterly newsletters. The actions on visibility carried out by the GSU are described in chapter 5 (forthcoming).

Table 13: Overview of key support activities by the Global Support Unit

Type of activity	Summary of events
<i>Technical support to countries</i>	<ul style="list-style-type: none"> • 81 technical support missions to 25 countries by Global Support Unit or representatives to support inception meetings, trainings, and/or assess progress in-country. • NAMA Net Facility, comprising seven consortiums, assisted countries on NAMA design elements, ranging from scenarios and NAMA design to financial modelling and MRV fitness tests.

Knowledge exchange

- 34 webinars held (majority in partnership) on topics including: GHG inventory systems; baseline emissions scenarios; NAMA fundamentals, design and prioritisation; climate finance; MRV; NDC planning; and good practices. 3 keynote presentations recorded on climate finance. More than 5100 views via either webinar attendance or YouTube visits.

Seventeen (17) knowledge products prepared on GHG inventory systems, NAMA design, LEDS, MRV private sector engagement, climate finance, INDCs, and good practices:

- NAMA Finance case study & Excel worksheet v 1.0, September 2013 for LECB annual global meeting (v1.3 updated October 2014 by UNDP)
- Facilitating the LEDS Process: Guidance Template (UNDP, October 2013)
- Guidance for NAMA Design: Building on Country Experiences (UNDP/UNFCCC/UNEP, Dec. 2013; updated November 2016)
- Thematic factsheets on LEDS, NAMAs, MRV and National GHG Inventory Systems (April 2014)
- LECB Information Brief: Strengthening National Greenhouse Gas (GHG) Inventory Systems & Greenhouse Gas Inventory System Toolkit (UNDP, April 2014)
- Mobilizing private sector engagement in LEDS and NAMAs: Lessons Learned from UNDP's LECB Programme (UNDP, May 2014)
- Barriers in Developing National Mitigation Strategies and Actions in Developing Countries: Lessons Learned from UNDP's LECB Programme (UNDP, May 2014)
- Global Good Practice Analysis on LEDS, NAMAs and MRV V1.0 (UNDP, International Partnership on Mitigation and MRV, June 2014)
- Measurement, Reporting and Verification: Technical Paper (UNDP, December 2014)
- Tracking Private Climate Finance Flows at the National Level: Proposed Country-Level Methodology v2.0 (UNDP, January 2015)
- LECB Information Brief: Incorporating Gender-Sensitive Considerations into Low-Emission Development Planning & Implementation and Toolkit (UNDP, January 2015)
- Designing and Preparing Intended Nationally Determined Contributions (INDCs) (UNDP, World Resources Institute, May 2015)
- Gender Mainstreaming in Mitigation and Technology Development and Transfer Interventions: Capacity Building Package (UNDP, GGCA, November 2015)
- Global Good Practice Analysis on LEDS, NAMAs and MRV V2.0 (UNDP, International Partnership on Mitigation and MRV, January 2016)
- INDC Country Support Analysis (UNDP, May 2016)
- NDC Implementation Readiness Checklist (UNDP, WRI, August 2016)
- Gender Equality in National Climate Action: Planning for Gender-Responsive Nationally Determined Contributions (UNDP, GGCA, Nov 2016)

Organisation by the Global Support Unit of global meetings and International exchange

- 9-10 Nov. 2011, Berlin, Germany;
- 1-4 Oct. 2012, Marrakech, Morocco;
- 25-27 Sep. 2013, Hanoi, Viet Nam;
- 14-16 Oct. 2014, Brussels, Belgium;
- 16-18 Sept 2015 in Santo Tomás, Costa Rica;
- 13-14 June 2016 in Brussels, Belgium;

<i>Thematic meetings</i>	<ul style="list-style-type: none"> • 2-5 May 2017 in Berlin, Germany: as a collaboration with GIZ and the LEDS Global Partnership (the 2017 Global NDC Conference) • Latin American Workshop on National GHG Inventory Systems, 15-17 May 2013, in Santiago, Chile. 60 participants. • Expert consultation on UNDP/UNFCCC/ UNEP NAMA Guidebook, 15 June 2013, in Bonn, Germany. 38 participants • Regional meeting on GHG inventory systems for Africa & Arab States, 25-27 Feb. 2014 in Livingstone, Zambia. 28 participants to LECB workshop stream. • NAMA Net inception, 26-28 Feb. 2014 in New York City, US. 41 participants. • Latin America & Caribbean regional meeting on engaging private sector, 14-16 May 2014, in Santiago, Chile. 79 participants o Tracking Private Climate Finance Flows, 18 May 2015, in Beijing, China. 18 participants • Asia regional meeting on engaging the private sector, 19-21 May 2015, in Beijing, China. 62 participants • LECB/GIZ Global Workshop on INDCs, 14-17 Apr. 2015, in Berlin, Germany. 136 participants • Africa regional meeting on engaging the private sector, 3-5 Nov 2015, in Accra, Ghana, 61 participants. • INDC Country Support Analysis (UNDP, May 2016) o NDC Implementation Readiness Checklist (UNDP, WRI, August 2016) • Gender Equality in National Climate Action: Planning for Gender-Responsive Nationally Determined Contributions (UNDP, GGCA, Nov 2016)
<i>Newsletters</i>	<ul style="list-style-type: none"> • Six (6) quarterly newsletters published between March 2012 and June 2013, featuring six country articles (superseded by the LECB Monthly Round Up email newsletter) • Thirty (30) LECB Monthly Round Up emails published between January 2013 and December 2015, featuring 77 country articles (superseded by LECB Programme Update blog and email in 2016) • Fifteen (15) LECB Programme Updates published between January 2016 and December 2017 (also serving as transition to newsletter for the NDC Support Programme), featuring 46 country articles. o 56 newsletters in total, featuring 129 country articles.
<i>Articles on partner websites, blogs</i>	<ul style="list-style-type: none"> • 67 articles on LECB results published in partner news channels • 13 blogs on UNDP and partners websites between November 2015 and December 2017
<i>Other visibility products</i>	<ul style="list-style-type: none"> • Results and impacts publication (in prep.) • LECB Programme overview poster and flyer • 15 NAMA briefs and posters prepared • Ten (10) Voices from the Field case studies published in December 2014 for COP 20
<i>Outreach through global and regional events</i>	<ul style="list-style-type: none"> • Side events at seven (7) UNFCCC meetings (Doha, Nov. 2012; Bonn, Jun. 2013; Warsaw, Dec 2013; Peru, Dec 2014; Paris, Dec 2015; Marrakech, November 2016; Bonn, December 2017).

- Presentations/participation in 74 international/regional events to promote visibility of Programme and contribute to international dialogue on climate change mitigation and ambition.

4.4 Monitoring

In the monitoring system set up for the Programme, the GSU had the overall task of monitoring overall programme progress while the UNDP country offices monitors national project implementation. Progress was reported on a quarterly basis by the national project coordinators who filled in short narrative report templates containing brief descriptions of progress, activities and outputs under each national outcome area. The GSU compiled the national progress reports in the global quarterly report and added a brief update on the global level activities and the enhanced support and provided these on a quarterly basis to the Steering Committee comprised of the EC, and representatives from Germany and Australia. Progress Reports were in-turn communicated to country delegations via the respective EC DGs. This process was established to accommodate for contact changes in EC delegations.

EC representatives also participated in the main monitoring and evaluation missions relating to action performance. An EC Results-Oriented Monitoring (EC ROM) of the LECB was conducted in early. It awarded the Programme the top ranking with respect to how the intervention was responding to the needs of the target groups, as well its alignment with EU development policies and strategies.

The EU, along with other Steering Committee member bodies were invited to all global fora (including LECB Global Annual Meetings) and in-country delegations were invited to and attended many of the national level meetings and workshops. Although not formally tracked, EU delegates were present at all Global Annual Meetings 2011-2017 and national delegates attended many inception workshops. The participation and coordination among country level delegations varied by country.

An independent midterm evaluation (MTE) was carried out in mid-2015. The MTE found that *“LECB is very relevant, and will remain so, as long as it responds to new demands and emerging themes and supports countries in addressing critical challenges such as financing and private sector involvement.”*

In addition to the above monitoring, the LECB Global Support Unit provided regular in-formal updates through visibility and communication pieces, including digital newsletters and ad-hoc requests for information prior to bi-lateral meetings or UNFCCC annual meetings.

5. Financial execution

	Annex III-Budget of the Action as per Addendum 3			Expenditures
	Unit	# of Units	Budget (Euro)	Euro
Human resources Salaries (Programme Management, Programme Assistant and Technical staff)			4,784,316	5,156,783
Travel and Per Diem			440,000	371,801
Equipment and Supplies			52,430	44,304
Office Expenses and Communication			270,000	289,298
Seminars and Workshops at the sub-regional/global level to exchange experiences and lessons learned			1,022,897	903,197
Publications, Lessons Learned, Dissemination and Communication Strategy			350,000	295,750
Regional Centers of Excellence/International Consultants			4,650,000	3,983,502
Country Level Projects/National Activities			18,318,207	18,843,215
Sub - TOTAL			29,887,850	29,887,850
Administrative cost		7.00%	2,092,150	2,092,150
TOTAL PROJECT COST			31,980,000	31,980,000

* Of the EUR 31,980,000 presented above, EUR 31,980,000 corresponds to eligible expenses (as per IPSAS terminology) and there are no legal commitments currently in force between UNDP (or UNDP's implementing partners) and a third party.

Financial summary (as per Addendum 2)

Total cost of the Action	31,980,000	EUR
Total EU contribution	18,000,000	EUR
First pre-financing EUR	1,100,000	EUR
Forecast pre-financing/interim payments	2,850,000	EUR
Forecast pre-financing/interim payments	4,850,000	EUR
Forecast pre-financing/interim payments	4,850,000	EUR
Forecast pre-financing/interim payments	3,850,000	EUR
Forecast final payment (to be requested)	500,000	EUR
Expenditures	31,980,000	EUR

6. ANNEX1 - Visibility and Knowledge Production

Refer to Annex 1 - LECB Programme contributions to global visibility and knowledge exchange

7. ANNEX 2 - Logical Framework

Refer to Annex 2 – Low Emission Capacity Building Logical Framework

8. ANNEX 3 - National Products developed under the programme

Refer to Annex 3 - Table of Contents of materials