

MAY 2012

# FY2009-11 ESMAP PORTFOLIO REVIEW





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# ABBREVIATIONS AND ACRONYMS

AAA	Analytical Advisory Activities	GWh	Gigawatt hour
ABG	Annual Block Grant	HEAT	Hands-on Energy Adaptation Toolkit
ADB	Asian Development Bank	HTG	“How to” Guide
AFR	Africa Region	ICR	Implementation Completion Report
AFREA	Africa Renewable Energy Access Program	IEG	Independent Evaluation Group
AIS	Activity Initiation Summary	IFC	International Financial Corporation
APL	Adaptable Programmatic Loan	INFRA	Infrastructure Recovery and Assets Platform
AUS	Activity Update Summary	JICA	Japan International Cooperation Agency
ACS	Activity Completion Summary	KSF	Knowledge Exchange Forum
ARA	African Refineries Association	LCR	Latin America and Caribbean Region
AUSAID	Australian Agency for International Development	LTMS	Long Term Mitigation Scenarios
CAS/CPS	Country Assistance Strategy/ Country Partnership Strategy	MACTool	Marginal Abatement Cost Tool
CDR	Client Document Review	MNA	Middle East and North Africa Region
CE	Clean Energy	MW	Megawatt
CF	Carbon Finance	M & E	Monitoring and Evaluation
CFL	Compact Fluorescent Lamp	PCN/PAD	Project Concept Note / Project Appraisal Document
CIF	Climate Investment Funds	PSF	Proposal Summary Form
COP	Conference of the Parties (to UNFCCC)	POL	Policy Note
CPF	Carbon Partnership Facility	PPA	Power Purchase Agreement
CSP	Concentrated Solar Power	PPIAF	Public Private Infrastructure Advisory Facility
CTF	Clean Technology Fund	PT	Partnership
DANIDA	Danish International Development Agency	RE	Renewable Energy
DFID	UK Department for International Development	REMTI	Renewable Energy Market Transformation Initiative
DPL	Development Policy Loan	RPT	Report
EA	Energy Access	SAR	South Asia Region
EAP	East Asia and Pacific Region	SEG	World Bank Department of Sustainable Energy
EASP	Energy Assessments and Strategies Program	SSA	Sub Saharan Africa
ECA	Europe and Central Asia Region	Sida	Swedish International Development Cooperation Agency
EE	Energy Efficiency	SIL	Specific Investment Loan
EECI	Energy Efficient Cities Initiative	SME	Small Medium Enterprise
EFFECT	Energy Forecasting Framework & Emissions Consensus Tool	SREP	Scaling-Up Renewable Energy Program
ESCO	Energy Services Company	TA	Technical Assistance
ESMAP	Energy Sector Management Assistance Program	ToU	Time of Use
ESW	Economic and Sector Work	TRACE	Tool for Rapid Assessment of City Energy
FIP	Forest Investment Program	TTL	Task Team Leaders
GEF	Global Environment Facility	UNFCCC	United Nations Framework Convention on Climate Change
GFR	Grant Funding Request	UNDP	United Nations Development Programme
GHG	Greenhouse Gas	WBG	World Bank Group
GIS	Geographical Information System	WBI	World Bank Institute
GPOBA	Global Partnership for Output Based Aid		
GRM	Grant Reporting Monitoring		

# 1 | INTRODUCTION

In accordance with its 2008-2013 Strategic Business Plan, ESMAP developed a portfolio monitoring and evaluation (M&E) system to assess the effectiveness of its activities in enabling client countries to achieve energy security, address energy poverty, and mitigate and adapt to climate change. The M&E system is designed to strengthen ESMAP's focus on outcomes and results at the beneficiary level while ensuring relevance to ESMAP's mission and implementation strategy. In this regard, a results framework was developed with specific outcomes and indicators for every single project supported by ESMAP in alignment with the World Bank's current results framework for analytical advisory activities (AAA)<sup>1</sup>. This portfolio review is part of ESMAP's ongoing effort to implement the results framework and M&E system, with a view to assessing the impact of ESMAP's its upstream activities on World Bank lending operations, government policies, country capacities, and development community's interventions in the energy sector.

## Methodology and Data Sources

This portfolio review takes stock of the results and outcomes of ESMAP projects and activities approved and implemented since fiscal year 2009 (July 2008) under four major themes, namely: *Energy Assessments and Strategy Program (EASP)*, *Energy Access (EA)*, *Energy Efficiency (EE)*, and *Clean Energy (CE)*. For this purpose, a three step multilayered approach was followed:

**Step 1 – Research and Data Collection:** First, an inventory was undertaken of ESMAP activities that were implemented since fiscal year 2009, with a view to developing a comprehensive picture of the services delivered by ESMAP through its knowledge and technical services and a detailed review of activities' status, theme, country/regional breakdown, and outputs and key deliverables. For this purpose, ESMAP conducted a desk review of key project documentation from identification and approval until completion and dissemination. The following key documents were reviewed:

- *Proposal Summary Form (PSF)*
- *Project Concept Document (PCN)*
- *Decision Review Meeting package*
- *Grant Funding Request (GFR)*
- *Activity Initiation Summary (AIS) / Activity Completion Summary (ACS)*
- *General project documentation (i.e. office reports, aide memoires, workshop proceedings, minutes and miscellaneous correspondence, general financial data)*
- *Activity Outputs & Deliverables (sector assessments, studies, best practice toolkits, dissemination seminars and workshops, training and other forms of advisory and analytical assistance).*
- *Grant Reporting Monitoring (GRM)*

These documents were accessed through World Bank information systems and selected databases including SAP, WBDocs, Operations Portal, Business Warehouse, Image Bank, Trust Funds systems, and ESMAP publications database and website.

**Step 2 – Assessment of Results and Outcomes Achieved:** The assessment then focused on an ex-ante analysis of completed activities – before the ESMAP activity was carried out or implemented – evaluating the World Bank lending portfolio, knowledge and capacity of clients, as well as the

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<sup>1</sup> The World Bank updated the results framework for its economic sector work (ESW) and technical assistance (TA) during the first quarter of fiscal year 2012 to better reflect the evolving role of the World Bank, not only as a producer of knowledge, but as a customizer and connector. ESMAP has adopted the outcomes and indicators developed under the Bank's new results framework.

regulatory, policy, and institutional framework in the energy sector for each one of the countries supported by ESMAP to establish a baseline to conduct the assessment. Using the baseline as a benchmark for comparison, an ex-post assessment was then conducted on five high-level outcomes<sup>2</sup> defined under the ESMAP M&E framework: (i) Development Finance Informed (ii) Policy / Strategy Informed (iii) Client Capacity Increased (iv) Knowledge Increased and (v) Innovative Approaches & Solutions Generated. The achievement of each outcome (or outcomes) for each completed project or activity is assessed and measured based on a set of indicators developed for each outcome.

**Step 3 – Triangulation:** Finally, the findings of the desk review were triangulated with information from other sources including direct feedback from the Task Team Leaders (TTLs) of the activities, Country Assistance Strategies (CAS), Country Partnership Strategies (CPS), World Bank’s Independent Evaluation Group (IEG) reports, selected websites from ministries, agencies, and organizations from client countries governments.

### Key considerations and Limitations of this Portfolio Review

- The assessment was conducted for ESMAP activities approved since fiscal year 2009 through fiscal year 2011 under the four major themes (EASP, Energy Access, Energy Efficiency, and Clean Energy). Activities from previous fiscal years but finalized during early fiscal 2009 were not considered under the review.
- For the purpose of this review, primarily completed activities under each of the portfolios were considered. A substantial portion of activities are still ongoing, and therefore it would be premature to assess their outcomes. It should be noted however, that in some particular cases, certain ongoing activities were included, as they have already started to demonstrate some results.
- The review assessed ESMAP’s influence and informing role, *direct and indirect*, on the World Bank Group’s lending operations and strategy on the energy sector. In most cases, although there is evidence of ESMAP activities informing Bank lending operations, it was not possible to segregate the specific loan amount directly linked to an ESMAP project from the full loan amount.
- For the purpose of this review, *World Bank Group lending* refers to contributions from sources of IBRD, IDA, IFC, GEF, and financing from Climate Investment Funds (CIF) including CTF, FIP and SREP. Influenced investments, lending or contributions from external partners or donors are listed but not included on the total amount of lending informed or influenced. In addition, amounts of lending operations currently in pipeline and expected to be approved during FY2012 and FY2013 are noted but *not included* on the total influenced lending amount.
- Given the complex set of factors that affect outcomes, attribution to specific ESMAP activities is often difficult. In many cases however, a direct link between ESMAP interventions and subsequent downstream activities is more evident.
- There was limited availability of adequate baseline data in many of the projects assessed. In such cases baseline values were determined based on review of status/country data before the ESMAP intervention. The use of appropriate baseline data is critical for performance assessment. Although most interventions plan to collect baseline data for results monitoring and possible impact evaluation, often such data are not collected.
- No country surveys or visits were undertaken for any of the activities evaluated. Research and analysis were conducted solely based on the sources of information listed above.

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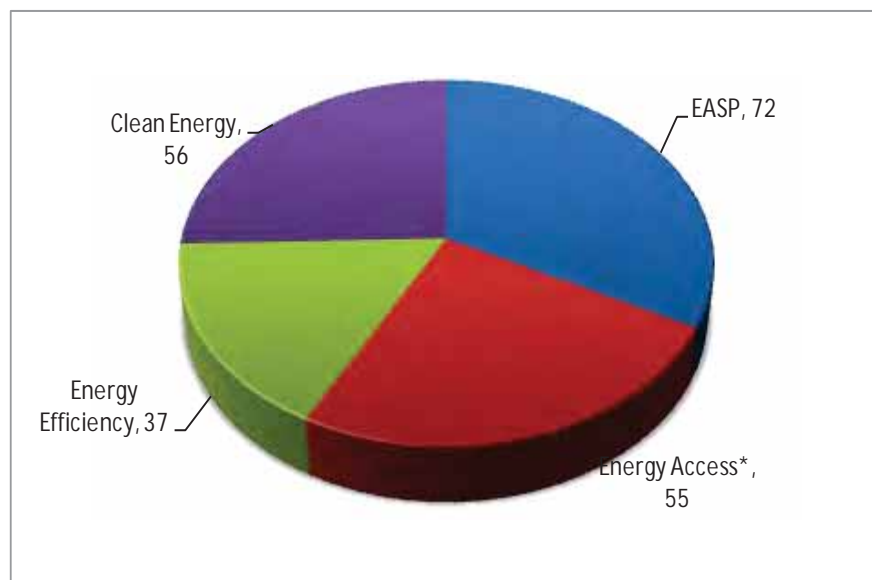
<sup>2</sup> Adopted from the results framework of the World Bank for Economic Sector Work (ESW) and Technical Assistance (TA) implemented during FY2012.

- The assessment focuses only on tracking the results and outcomes directly influenced by ESMAP activities. Since ESMAP activities also have substantial indirect impacts, the results and outcomes compiled in this report are likely to under-report the overall influence of ESMAP activities. Also, given the upstream nature of these activities, the report does not cover impact assessment considering the longer time frame required for its proper tracking and measurement.

### ESMAP Portfolio Overview

ESMAP's portfolio comprises 220 activities<sup>3</sup> under the four ESMAP portfolio themes (*EASP, EA, EE, CE*) for the FY2009-11 period with total grant allocation of \$65<sup>4</sup> million and total disbursements of about \$52 million<sup>5</sup> (Figure 1 and 2).

Figure 1 - Number of Activities under ESMAP Portfolio by Theme



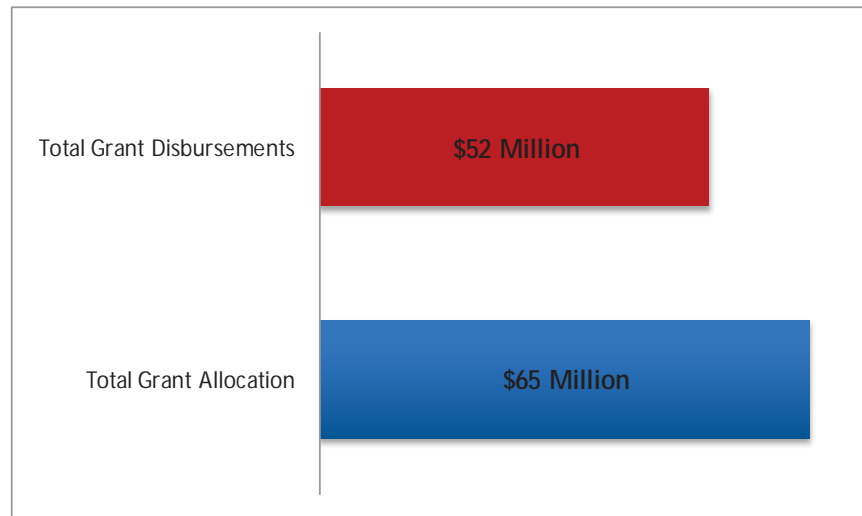
<sup>3</sup> As of June 30<sup>th</sup>, 2011

<sup>4</sup> Including projects implemented under the AFREA program

<sup>5</sup> As of end of March 2012



**Figure 2 – Total Grant Allocation and Disbursement under ESMAP Portfolio (\$ Million)**



Fifty-one activities (23%) under the portfolio are global or targeted to multiple countries. Allocation at the regional level is similar across the six regions, although there is a slightly higher number of projects implemented in the Africa region with 37 (17%), followed by Latin America and the Caribbean with 32 (15%), Middle East and North Africa region with 28 (13%), East Asia and Pacific with 26 (12%), Europe and Central Asia with 25 (11%), and finally the South Asia region with 21 projects (10%). However, in terms of grant allocation, the Europe and Central Asia region has the lowest with only 6% of the funds. The breakdown of number activities by region and grant amount is shown in Figures 3 and 4.

**Figure 3 – Number and Percentage of Activities Implemented by Region**

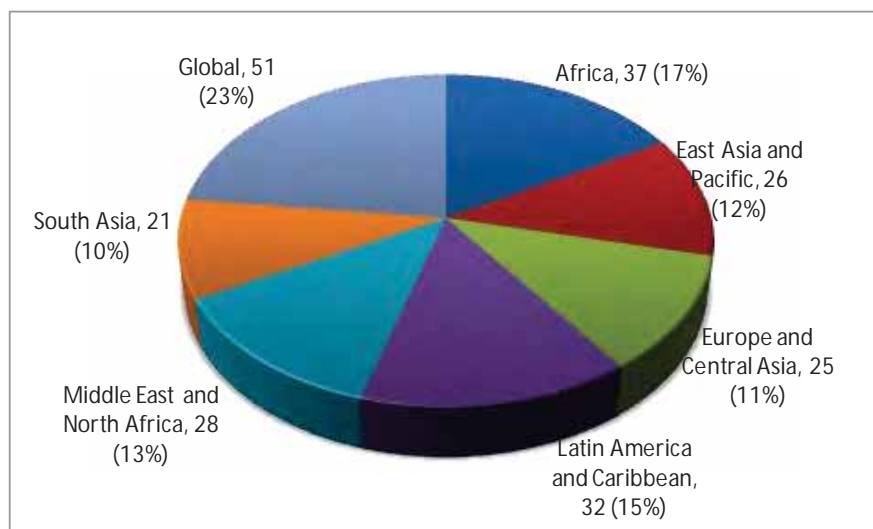
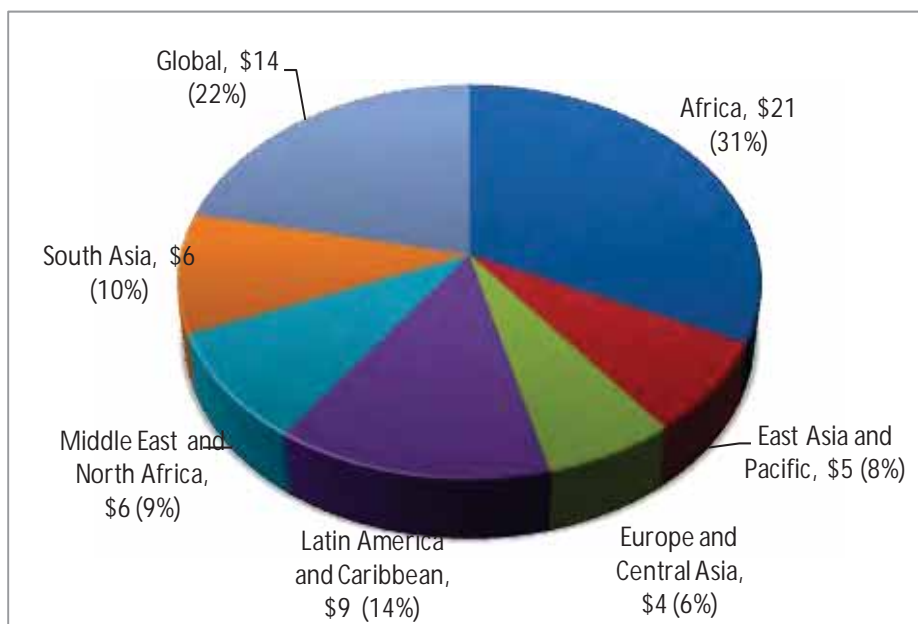


Figure 4 – Grant Allocation by Region of ESMAP Activities



### Summary of Outcomes Observed

The assessment provided evidence that 191 outcomes were achieved to date through ESMAP projects and activities, as measured against key performance indicators. While the influence of activities was more evident in informing or influencing World Bank Group lending and strategy, there is also important evidence of ESMAP’s contribution to government policies, enhancing country capacity, disseminating knowledge and introducing cutting-edge solutions<sup>6</sup>. Figure 7 shows the number of outcomes observed by indicator type under each of the four themes.

Following are some key conclusions and insights.

- ESMAP has played an active role in influencing and improving, directly and indirectly, the direction and quality of the World Bank Group’s lending in the energy sector. A total of 69 outcomes provided evidence of influencing or informing development lending of about \$12 billion.<sup>7</sup> The ECA and LCR regions alone accounted for about half of the total development financing informed by ESMAP activities (about \$5.9 billion). However, in terms of number of outcomes achieved, the EAP region had the highest number with 14 instances and the ECA had the lowest with only five. This is explained by the size and amount of World Bank lending operations which are typically much lower for countries in regions such as Africa and South Asia compared to countries in the ECA or LCR regions. Amounts and number of outcomes of development financing influenced *directly or indirectly* by ESMAP FY09-11 broken down by region is showed in Figures 5 and 6.

<sup>6</sup> Some ESMAP activities contributed to achieving one or more outcomes. Therefore, some activities could account for one or more outcomes under a particular portfolio.

<sup>7</sup> This amount excludes World Bank Group loans currently in pipeline and loans influenced by ESMAP activities but approved during fiscal year 2012.

Figure 5– Development Financing Influenced by ESMAP Activities by Region (\$ Million)

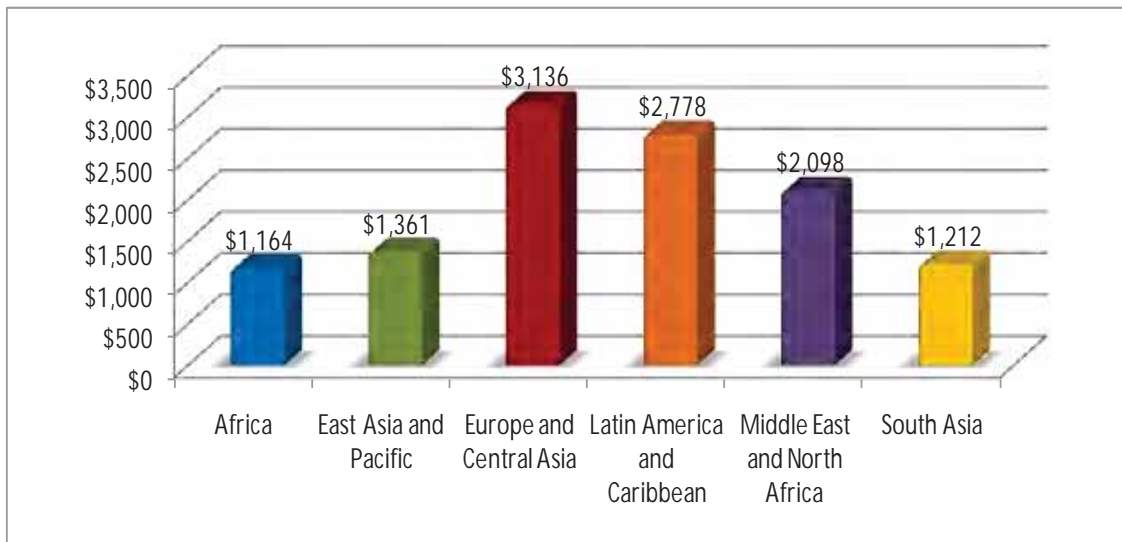
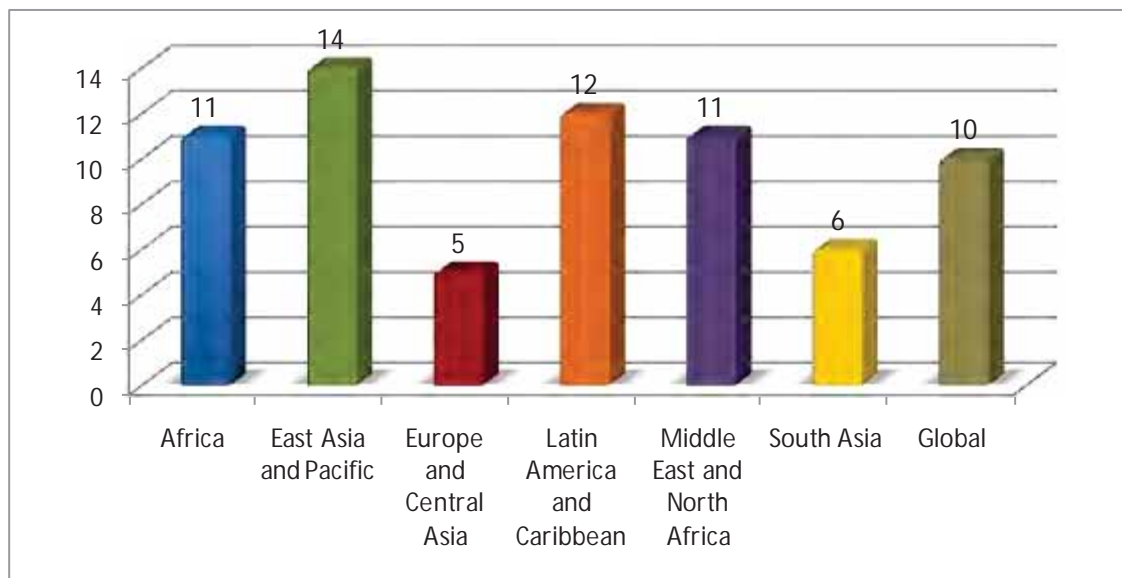


Figure 6– Number of Outcomes Observed by Region: Development Financing Informed by ESMAP Activities (\$ Million)



- A key role that ESMAP fulfills is to provide policy advice to client countries on strategically important energy sector issues. ESMAP’s assistance has helped client countries make better-informed policy decisions and translate those decisions into strategies and programs which often lead to new legal and regulatory frameworks, adoption of sector strategies and implementation plans, compliance with existing laws, or other policy formulations in the energy sector. During the FY09-11 period, there were 58 outcomes in which ESMAP activities influenced energy policies in more than 40 countries.
- ESMAP has also supported client countries to build or enhance their capacity to implement policies, programs and strengthen institutions in the energy sector. This is undertaken in a number of ways including advice on client-owned blueprints for institutional strengthening, operational advice on policy formulation and hands-on implementation, preparation of technical notes, good practice manuals, and sharing international good practice. During the FY09-11 period, 30 outcomes

demonstrated that ESMAP activities have contributed to capacity building in more than 40 client countries.

- While virtually all ESMAP activities have contributed to expanding and strengthening client's knowledge and supported the achievement of other outcomes, there were 19 instances in which ESMAP has been particularly effective in disseminating knowledge and facilitating exchange of best practices with clients and partners.
- ESMAP has undertaken original analytical work and developed innovative approaches and cutting edge solutions to help respond to energy sector challenges of client countries. Cutting-edge solutions have been used not only by governments but also by a wide array of stakeholders including the private sector and nongovernmental organizations. Since FY2009, there have been 15 outcomes of innovative products benefiting the wider energy practice in client countries.
- The review concluded that direct results and outcomes could not be tracked or observed for 39 activities. Several factors accounted for this, including a delay in the delivery of outputs, changes in political and institutional context of activities, poor quality of outputs, and/or activities completed too recently to appropriately measure impacts or results.

**Figure 7 – Number of Outcomes Observed under all Themes by Indicator Type**

Outcomes and Indicators	No. of Outcomes Achieved by Theme and Indicator Type				
	EASP	EA	EE	CE	Total
<b>1. Development Financing Informed</b>					
1.1 Preparation of new operation informed	17	10	8	10	45
1.2 Existing operations informed	4	7	3	2	16
1.3 Mobilization of non-Bank resources informed	0	7	1	0	8
1.4 Government expenditure informed	0	0	0	0	0
<i>Subtotal Outcome 1</i>	<b>21</b>	<b>24</b>	<b>12</b>	<b>12</b>	<b>69</b>
<b>2. Policy/strategy Informed</b>					
2.1 Government policy/strategy informed	14	7	5	13	39
2.2 Public debate stimulated/initiated	0	1	0	0	1
2.3 Contributed to stakeholder involvement	1	1	0	0	2
2.4 Development community/partner policy/strategy informed	0	2	0	0	2
2.5 Bank country strategy (CAS/CPS) informed/influenced	0	2	1	0	3
2.6 Bank sector strategy informed/influenced	5	4	1	1	11
<i>Subtotal Outcome 2</i>	<b>20</b>	<b>17</b>	<b>7</b>	<b>14</b>	<b>58</b>
<b>3. Client Capacity Increased</b>					
3.1 Design capacity strengthened	3	0	2	6	11
3.2 Implementation capacity strengthened	5	10	1	2	18
3.3 Monitoring & Evaluation capacity increased	0	1	0	0	1
3.4 Clients are recognized with good practice or similar awards	0	0	0	0	0
<i>Subtotal Outcome 3</i>	<b>8</b>	<b>11</b>	<b>3</b>	<b>8</b>	<b>30</b>

<b>4. Knowledge Increased</b>					
4.1 Facilitated exchange of best practice with clients	2	3	2	5	12
4.2 Facilitated exchange of best practice with partners	0	0	0	3	3
4.3 Disseminated best practices	1	0	1	2	4
<i>Subtotal Outcome 4</i>	<b>3</b>	<b>3</b>	<b>3</b>	<b>10</b>	<b>19</b>
<b>5. Innovative approaches &amp; solutions generated</b>					
5.1 New innovative approach fostered	0	0	3	0	3
5.2 New innovative approach developed	2	5	2	2	11
5.3 Client is able to adopt/harness new technologies, innovative ideas, know-how.	0	0	1	0	1
<i>Subtotal Outcome 5</i>	<b>2</b>	<b>5</b>	<b>6</b>	<b>2</b>	<b>15</b>

### How this Report is Organized

The report dedicates a chapter for each one of the four themes – Energy Assessments & Strategy Programs (EASP), Energy Access (EA), Energy Efficiency (EE) and Clean Energy (CE). Each chapter provides an overview of the ESMAP portfolio under the theme with a summary of the outcomes observed followed by a section with highlighted projects. The annexes provide complete details on the outcomes achieved by each of the activities under the portfolio themes.

## 2 | ENERGY ASSESSMENTS AND STRATEGIES PROGRAM

### 2.1 INTRODUCTION

Since the early years of its inception, ESMAP has helped client countries undertake comprehensive assessments to help prepare energy strategies and to inform legal, institutional, and regulatory framework. These assessments cover a wide range of topics such as electricity market design, regional electricity trade, energy pricing reform, transmission planning, gas sector development and assessment of the impact of high oil prices. The current ESMAP business plan consolidates the vast majority of such activities undertaken by ESMAP under the Energy Assessments and Strategies Program (EASP)<sup>8</sup>.

### 2.2 ESMAP'S PORTFOLIO OF ENERGY ASSESSMENTS AND STRATEGIES PROGRAMS (EASP) (FY2009-11)

ESMAP's FY2009-11 EASP portfolio comprises 72 activities<sup>9</sup> implemented by both the World Bank regional departments through the Annual Block Grants (ABGs) and the World Bank's Sustainable Energy Department (SEG). Total grant allocation for activities under the EASP portfolio was \$17.2 million with total disbursements of about \$14 million<sup>10</sup> (Figure 8).

There are 63 activities implemented through ABGs, and 9 (global) implemented by the Bank's Energy Department, four of which are directly own-managed by ESMAP. The largest number of EASP activities was implemented in the Middle East and North Africa region with 16, followed by Europe and Central Asia with 12, South Asia region with ten, Latin America and Caribbean with eight, East Asia and Pacific with nine and finally Africa with eight activities. Although the number of activities implemented in Africa was low, the value of disbursement was substantial due to the relatively large size of the activities. The breakdown of activities by region and implementing unit is shown in Figures 9 and 10. Grant allocation for each of the regions is shown in Figure 11.

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<sup>8</sup> It is important to note that several energy efficiency and renewable energy activities are incorporated under the Energy Assessment and Strategies Program (EASP), where energy sector policy and institutional development cut across themes such as energy efficiency and renewable energy.

<sup>9</sup> As of June 30<sup>th</sup>, 2011

<sup>10</sup> As of end of March 2012

Figure 8 – EASP Portfolio Grant Allocations and Disbursements (as of March 2012) (\$ Million)

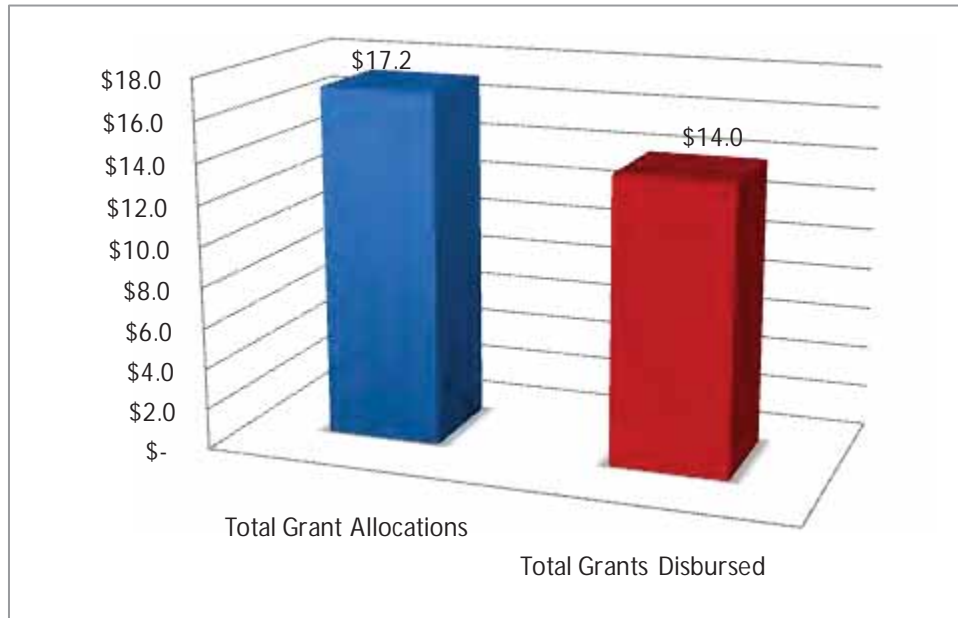
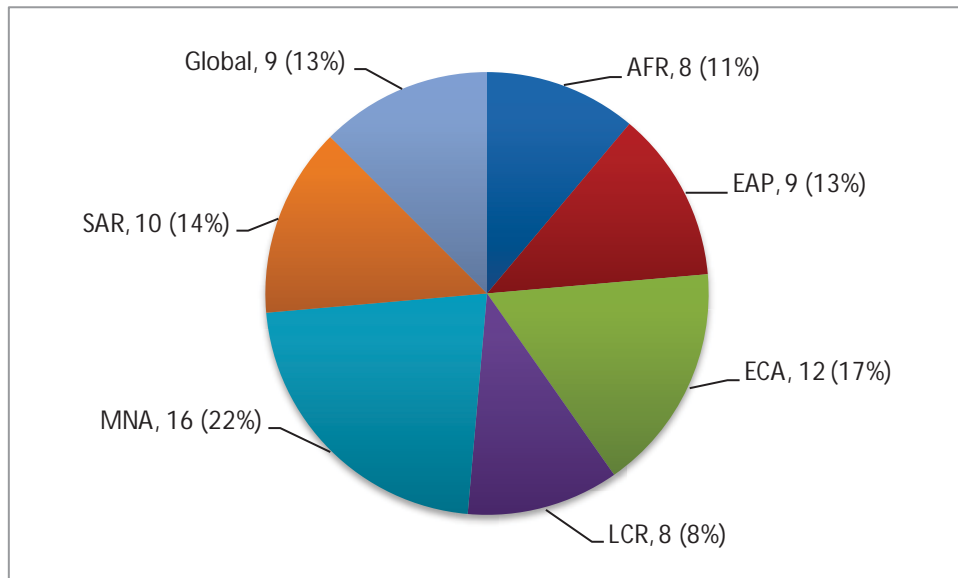


Figure 9 – Number of ESMAP EASP Activities by Region



AFR: Africa, EAP: East Asia and Pacific, ECA: Europe and Central Asia, LCR: Latin America and Caribbean, SAR: South Asia

Figure 10 – Number of ESMAP EASP Activities by Implementing Unit

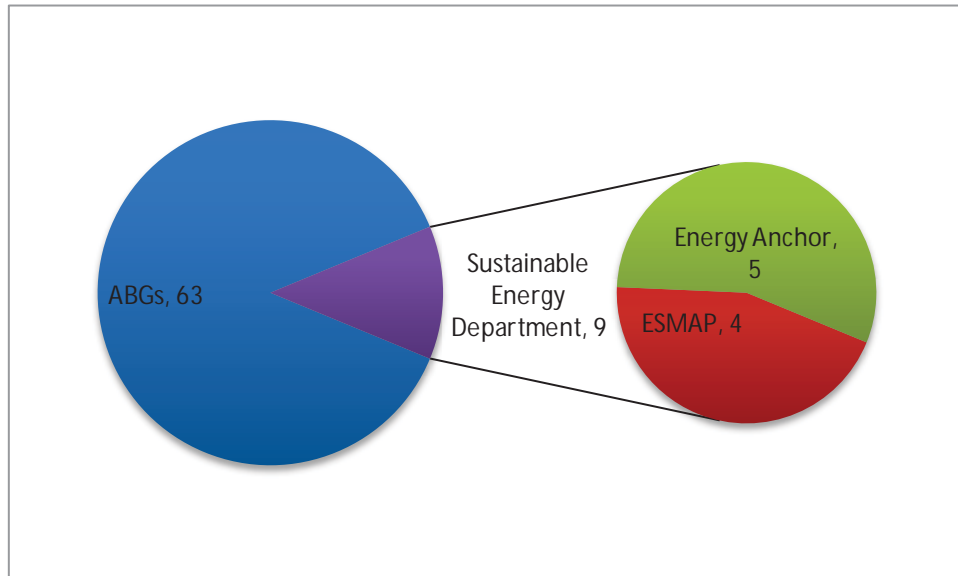
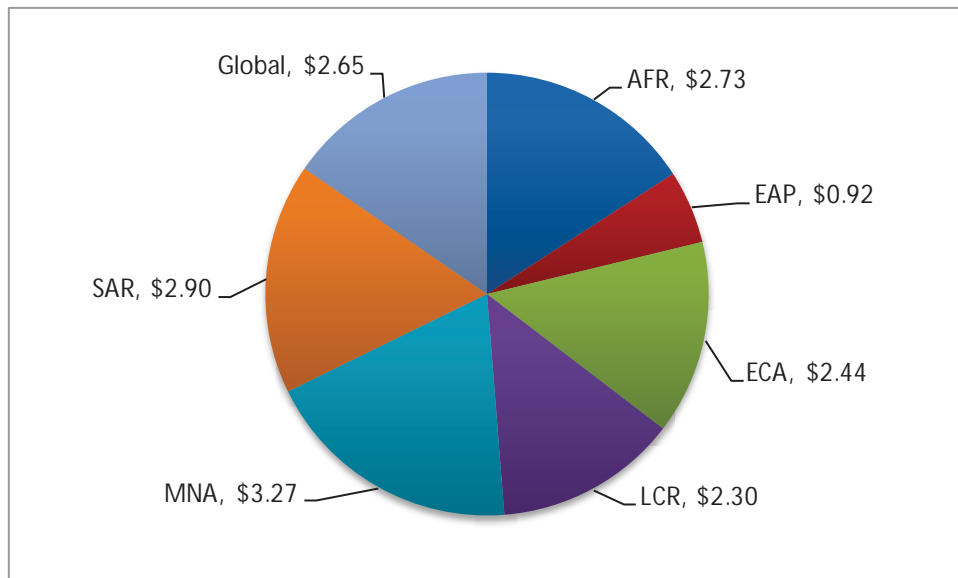


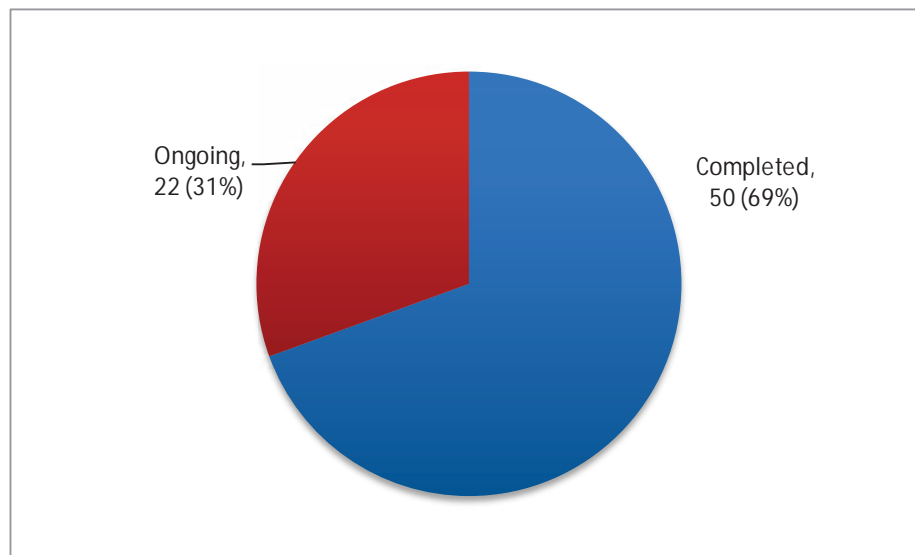
Figure 11 – Grant Allocation by Region under EASP Portfolio (\$ Million)



Of the total 72 activities under the EASP portfolio, 50 (69%) have been completed and delivered to clients and 22 (31%) are still ongoing (Figure 12). Although most ongoing activities have not yet delivered final outputs and therefore it is premature to discern results, some have been included as part of assessment as they documented early noticeable outcomes.



Figure 12 – Number of ESMAP EASP Activities by Status



## 2.3 ASSESSMENT OF OUTCOMES AND RESULTS

The assessment provided evidence that 54 outcomes were achieved under the EASP portfolio. Results were especially notable under the Policy or Strategy Informed and Development Financing Informed outcomes confirming the important role of ESMAP in catalyzing funds and providing key advisory services in support of sector policies and promoting energy investments in developing countries.

Figure 13 below shows the number and percentage of outcomes observed under the EASP portfolio by outcome type. Figure 14 provides a breakdown of number outcome measured by type of indicator. Refer to Annex 1 for details of outcomes achieved under each of the activities.

Figure 13 – Number of Outcomes Observed under the EASP Portfolio

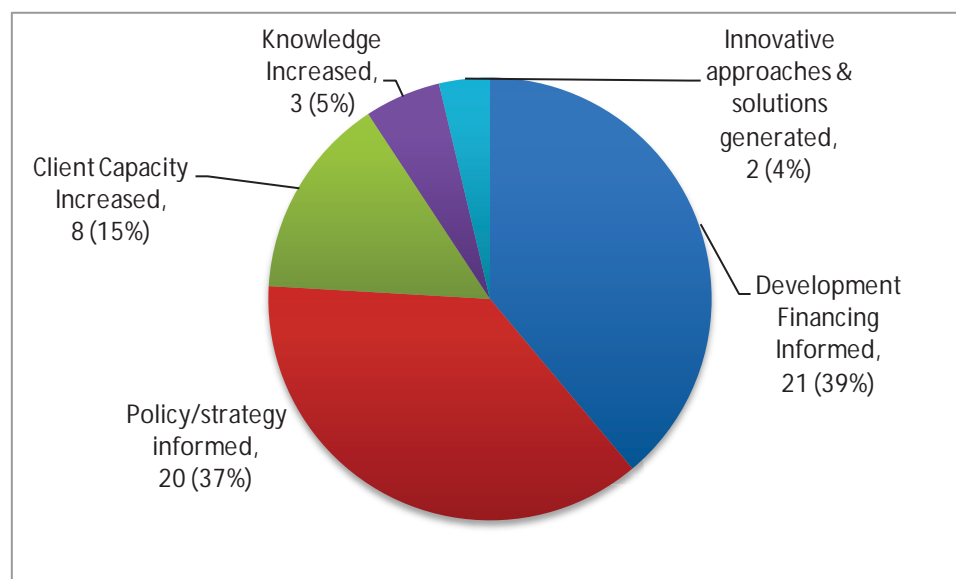


Figure 14 – Number of Outcomes Observed under EASP Portfolio by Indicator Type

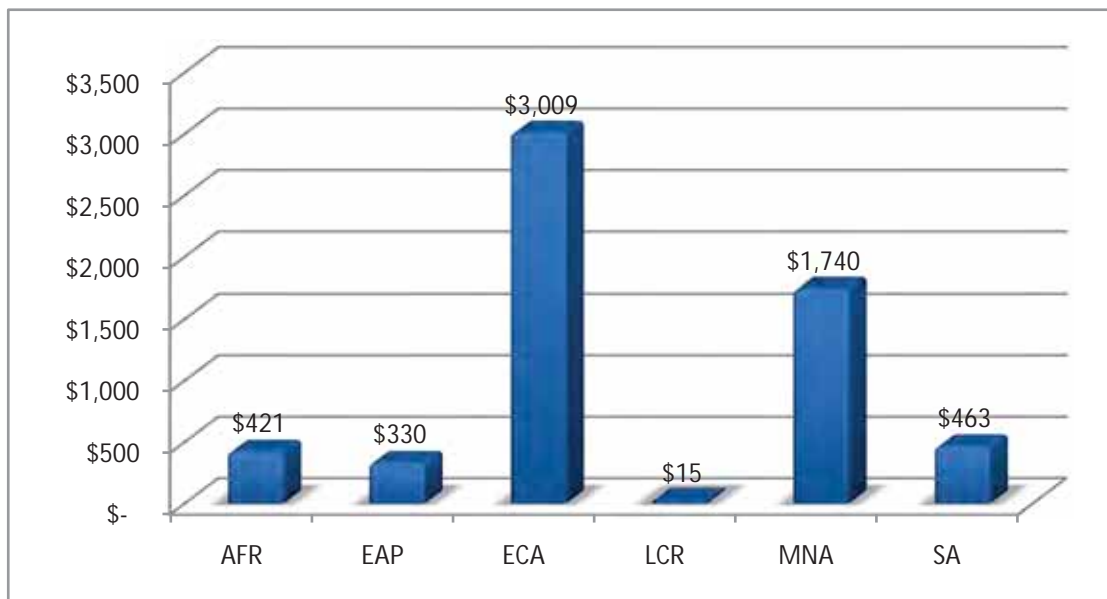
Outcomes and Indicators	No. of Outcomes Achieved by Indicator Type
<b>1. Development Financing Informed</b>	
1.1 Preparation of new operation informed	17
1.2 Existing operations informed	4
1.3 Mobilization of non-Bank resources informed	0
1.4 Government expenditure informed	0
<i>Subtotal Outcome 1</i>	<i>21</i>
<b>2. Policy/strategy Informed</b>	
2.1 Government policy/strategy informed	14
2.2 Public debate stimulated/initiated	0
2.3 Contributed to stakeholder involvement	1
2.4 Dev't community/partner policy/strategy informed	0
2.5 Bank country strategy (CAS/CPS) informed/influenced	0
2.6 Bank sector strategy informed/influenced	5
<i>Subtotal Outcome 2</i>	<i>20</i>
<b>3. Client Capacity Increased</b>	
3.1 Design capacity strengthened	3
3.2 Implementation capacity strengthened	5
3.3 Monitoring & Evaluation capacity increased	0
3.4 Clients are recognized with good practice or similar awards	0
<i>Subtotal Outcome 3</i>	<i>8</i>
<b>4. Knowledge Increased</b>	
4.1 Facilitated exchange of best practice with clients	2
4.2 Facilitated exchange of best practice with partners	0
4.3 Disseminated best practices	1
<i>Subtotal Outcome 4</i>	<i>3</i>
<b>5. Innovative approaches &amp; solutions generated</b>	
5.1 New innovative approach fostered	0
5.2 New innovative approach developed	2
5.3 Client is able to adopt/harness new technologies, innovative ideas, know-how.	0
<i>Subtotal Outcome 5</i>	<i>2</i>

**Outcome 1 – Development Financing Informed:** Since ESMAP focuses its efforts “upstream” through three core functions, a key measure of success is the extent to which ESMAP is able to influence and inform lending in the energy sector. Through its Annual Block Grant system, ESMAP activities have, both directly and indirectly, helped shape the Bank’s energy lending.

A total of 21 outcomes (achieved by 19 EASP activities) provided evidence of influencing World Bank Group lending of about \$6 billion<sup>11</sup>, of which \$4.7 billion (78%) was concentrated in the ECA and MNA regions (Figure 15).

<sup>11</sup> This amount excludes World Bank loans currently in pipeline and loans influenced by ESMAP activities but approved during fiscal year 2012.

Figure 15 - Amount of World Bank Group Lending Influenced by ESMAP FY09-11 EASP Activities (\$ Million)



EASP activities have been especially effective in influencing lending in countries such as Turkey, Egypt and Vietnam:

- In Turkey, ESMAP has helped the government establish the framework for a competitive electricity market run by the Turkish Electricity Transmission Corporation (TEDAŞ). The work supported by ESMAP has been instrumental in facilitating a significant scale up of the World Bank's lending to Turkey.
- In Egypt, ESMAP has helped the government develop an analytical framework and strategy for tariffs that are reflective of the underlying economic costs, design time of use tariffs as well as policies to mitigate the social impact of the price adjustments. These have been used as inputs in the Bank's energy sector policy dialogue with Egypt and have helped underpin the preparation of several large energy sector lending projects in the country. In addition, specific reform measures suggested by ESMAP studies, such as time of use tariff design are to be implemented as part of these loans. In parallel, an ESMAP study has helped identify the priority investments that World Bank could finance in wake of the global financial crisis.
- In Vietnam, ESMAP has been engaged in helping guide the development of the country's Master Gas Plan and in assessing the impacts of the financial crisis on the power sector. These activities have helped underpin a series of World Bank investment projects and development policy loans.

**Outcome 2 – Policy/Strategy Informed:** Another key role that ESMAP fulfills is to inform the World Bank's energy strategies and to provide policy advice to client countries on important issues in the energy sector. 20 outcomes were observed to have influenced and informed the Bank's energy sector strategies and energy policies of client countries.

- *Informing World Bank Energy Sector Strategies:* EASP activities have directly influenced the preparation of World Bank Group's overall energy strategy as well the energy strategies and work programs of East Asia and Pacific, South Asia, Central America and Middle East and North Africa. ESMAP's role in the discussions around the preparation of WBG energy strategy and East Asia and Pacific energy strategy is particularly noteworthy. For the preparation of the Bank's energy strategy, ESMAP helped prepare background papers on energy subsidy reform, clean energy technology choices, private and public sector roles in the power sector, and energy access. These papers helped frame the consultations that were undertaken around the world for the preparation of the strategy.

In parallel, the preparation of the strategy benefited indirectly from the wider body of analytical and advisory work undertaken by ESMAP over the past several years. Also, in the East Asia and Pacific region, ESMAP in partnership with AUSAID, ASTAE, and PHRD helped undertake a detailed assessment of the challenges and prospects of the energy sector. Based on this assessment, a report outlining a strategic vision of sustainable energy future in East Asia, and presenting a menu of options and successful examples of policy frameworks and financing mechanisms was prepared. The analysis and the recommendations of the activity underpin the Bank's energy strategy for the East Asia region.

- *Informing Government Policy Strategy:* EASP activities implemented during FY2009-FY2012 helped prepare or influenced energy policies in more than 10 countries. Notable policies and regulations directly influenced by ESMAP activities include India's 12th Five Year Plan, policy measures for sustainable development of coal sector in China, legislation and regulation for electricity markets in Turkey, natural gas sector regulations in Peru, and establishment of an agency for development of energy efficiency and renewable energy in Morocco.

**Outcome 3 – Client Capacity Increased:** ESMAP also partners with its client countries to improve their capacity to implement policies and programs, and develop and strengthen institutions. This is undertaken in a number of ways including advice on client-owned blueprints for institutional strengthening, operational advice on policy/program formulation and hands-on implementation, preparation of technical notes, good practice manuals, and procedural guidelines and Bank-facilitated, client-managed meetings aimed at sharing international good practice and exchanging knowledge. During FY2009-FY2012, EASP activities helped enhance capacity to undertake energy sector management activities in eight countries. ESMAP's capacity building ranged from preparation of a financial model for transmission in Philippines to the preparation of the least cost generation and transmission expansion plan for the Southern Africa Power Pool.

**Outcome 4 – Knowledge Increased:** ESMAP undertakes original analytical work and creates knowledge and innovative solutions to help Client's respond to energy sector challenges. Knowledge generated by ESMAP is used not only by governments but also by a wide array of stakeholders from academia, the private sector, and nongovernmental organizations. During FY09-11, there were three instances when ESMAP activities helped increase energy sector knowledge, including the development of policy principles for developing transmission for renewable energy, policy recommendation and lessons learned on the optimal power market structure, development of analytical tools for environmentally sustainable power development

**Outcome 5 – Innovative Approaches and Solutions Generated:** During FY2009-11, ESMAP created a number of innovative products and solutions that are likely to be beneficial to the wider energy practice. For example, an ESMAP activity helped undertake a pilot in Shangdong province in China using modern optimal dispatch software to demonstrate cost savings that would result from a change to least cost dispatching of the power plants. Similarly, ESMAP helped establish suitable capacity certificate schemes and competitive auction mechanisms to support power market reforms in Turkey.

## 2.4 HIGHLIGHTED PROJECTS



ESMAP ACTIVITY: GAS SECTOR DEVELOPMENT FRAMEWORK  
COUNTRY / REGION: VIETNAM / EAST ASIA AND PACIFIC

### Overview

Fuelled by economic growth above 7 percent for the last several years, energy demand is growing rapidly in Vietnam—15 percent annually. Much of this demand is driven by expanding access to electricity. To meet the energy needs for generating electricity, the government's 2006–15 Gas Master Plan for Southern Vietnam has identified the country's gas reserves as a key resource for power generation to improve energy access and energy security. Vietnam hopes to meet more than 40 percent of its power needs from gas-fired plants by 2015. A tripling of gas supply in 15 years is planned, almost entirely for power generation.

### Scope & Recommendations

ESMAP first helped the government of Vietnam by reviewing the Gas Master Plan. Noting inadequate consideration of economic and financial planning and market development, the review emphasized the need for a qualitative framework—including sector planning principles, a method for determining optimal utilization, pricing principles for gas, regulatory methodologies, gas market design options, and energy security—as the basis for specific gas sector and policy development decisions. Second, ESMAP provided follow-up technical support to help the government make the framework a reality, covering sector planning principles (including key trade-offs, such as between energy security and least-cost options), gas market design and sector management, pricing and regulatory methodologies, and a roadmap for implementing the market design. The Vietnam Petroleum Institute then added these insights to the ongoing Gas Master Plan for Vietnam. ESMAP is currently providing support for developing gas pricing methodology and conceptual design of the gas market, including a roadmap for its implementation. ESMAP will provide assistance for consultation process for the adoption of a gas market and support the government in develop an organizational and regulatory framework for the gas sector. Most signs point to strong ownership of these activities on the part of the government. However, the recommendations involve far-reaching changes in the current institutional setup, processes, and mind-set, and it remains to be seen how much will be adopted, and the impact that it might have on the gas sector.

### Observable Results and Outcomes

- *Informed World Bank Lending.* Approval of a Gas Master Plan by the government was one of the triggers for the World Bank loan *Poverty Reduction Strategy Credit 10* for Vietnam approved in FY2010 (\$150 M).



## Overview

Since 2001, Turkey's electricity demand has grown more than 8 percent annually. Turkey has moved swiftly to overhaul the electricity sector to meet growing demand in an efficient and cost-effective manner. The reforms—consistent with the *European Union's Acquis Communautaire* framework—have so far unbundled the sector, restructured state-owned entities, privatized the electricity distribution business, created an independent market regulator, and established a competitive electricity market.

## Scope & Recommendations

Through a series of activities, ESMAP provided technical advice and training to the government for the development and implementation of power market reforms, including launching of hourly metering and settlement, day ahead electricity market, capacity certificates in Turkey.

- *Supporting Electricity Market Operations:* Provided the basis for the design and implementation of an innovative capacity mechanism, plus an auction process, for procuring new generation in a manner consistent with the competitive market was implemented. The ESMAP activity also helped institute capacity in different aspects of market operations, such as using water value and dispatch models, determining system marginal prices based on bids and offers, and managing the settlement system through workshops, training, twinning arrangements, and toolkits. The outputs of the ESMAP activity were used as inputs into amendments to the Electricity Market Law, on supply security aspects including enabling provisions for introducing capacity measures and auctions.
- *Capacity Building for Electricity Market Operations:* Under this activity, ESMAP supported training and capacity building on market management systems and communication systems to enable TEIAS to transition to the final market design, and particularly in grid management for large scale renewable energy capacity additions. ESMAP funded external experts to provide TEIAS staff with on-call advice on implementation issues and system operations. Equally importantly, ESMAP supported a needs assessment and conceptual design for advanced automated grid type solution to assist in integrating substantial amounts of intermittent wind generation into the transmission grid without causing instability.

## Observable Results and Outcomes

- *Informed Government Policy:* Based on the recommendations from ESMAP, key regulation and legislation were approved in Turkey (i) Amendments to the electricity market law to monitor, evaluate and take measures to ensure security of supply (Law No. 5784 of July 26, 2008), and (ii) Modified balancing and settlement regulations to improve the functioning of the wholesale market (publicly issued in April 2009).
- *Informed World Bank Lending:* ESMAP's engagements have helped catalyze increase in World Bank lending for Turkey to \$1.8 billion over the FY09-FY10 period compared with \$269 million in the two years preceding that. ESMAP activities have played an important role in facilitating this scale up by helping provide the analytical underpinnings and enabling environment for Bank investment operations, as well as helping build capacity in government agencies.





## Overview

Over the last decade, residents of Maharashtra, India's second most populous state faced crippling power shortages, with outages lasting up to 10 hours daily. With power cuts emerging as the major constraint to growth and fast becoming a source of public dissatisfaction, the state launched a multi-pronged plan to produce more electricity and to deliver it more efficiently to consumers. The state government requested assistance for Maharashtra State Electricity Transmission Corporation Limited (MSETCL), which had been created in 2005 as part of the unbundling of the vertically integrated state power utility. The scale of the challenge was immense – traditionally, transmission lacked adequate investment and managerial focus on project implementation. Despite its recent corporatization, MSETCL lacked necessary systems and skills essential for achieving the objectives set before it by the government - to scale up its annual investment program from its typical US\$ 100 million per year, to US \$ 1 billion per year for each of the next four years.

## Scope & Recommendations

It was against this background that ESMAP together with the Public-Private Infrastructure Advisory Facility (PPIAF) and the World Bank initiated its assistance for MSETCL. Building on work undertaken by PPIAF, ESMAP provided support for business re-engineering and strengthening institutional capacity of MSETCL, including strengthening capacity for managing public-private contracts, implementing policies to strengthen its own human resources and building sustainable change management practices. MSETCL is now implementing a detailed Project Monitoring & Review Process and a well defined Strategic Communication Framework between the Contractor and MSETCL. This involves major changes in business processes and hierarchies within the organization. Existing roles have been re-aligned and new roles created to manage the new business processes. These revised roles and reporting system have helped create an accountability system that allows empowerment to decentralized staff at field levels, who are in touch with ground level realities. After a year of implementation and continued management support to transformation initiatives, the change is now permeating across employee levels in the organization right from management to field staff.

## Observable Results and Outcomes

- **Development Finance Informed:** The ESMAP activity served as a springboard for the These reforms have helped MSETCL attract financing from International Finance Corporation without any state guarantees which led to the approval of the IFC loan to MSETCL (\$200 M). The project supports the medium-term capital expenditure program of MSETCL, aimed at addressing system bottlenecks, replacing or upgrading aging assets, and handling the expected doubling of electricity generation in the state. As part of the loan support, recommendations were made for improving corporate governance practices and the development of a systematic framework for addressing environment and social issues.
- **Client Capacity Increased:** The ESMAP activity helped improve the institutional capacity in Maharashtra State Electricity Transmission Corporation Limited to effectively implement its proposed investment plan to bridge high demand-supply gap in power in the state of Maharashtra, effectively maintain assets and enhance competition (through transmission open access) in the state. Under the activity, several meetings, workshops and field visits were conducted for dissemination of proposed changes and to obtain feedback the changes, which resulted in better

design and implementation. The activity is expected facilitate fast-track transmission infrastructure development and improved business processes/organizational structures.



### 3.1 INTRODUCTION

Access to modern energy services remains a major global challenge. About 1.4 billion people lack access to electricity and 2.7 billion people rely on traditional biomass fuels for cooking and heating. This challenge has been at the forefront of ESMAP work. Since its inception, ESMAP has had a strong portfolio of activities aimed at increasing access to both electricity and clean cooking solutions. The energy access (EA) portfolio has encompassed a wide range of analytical and advisory services such as studies, technical guidance, development of policy notes and operational documents, training, and knowledge sharing forums. The activities' beneficiaries have been various developing countries' institutions including ministries of energy, rural energy agencies, small and medium enterprises, and agencies implementing World Bank-financed energy and mining projects.

- Energy access can be categorized under the following areas:
- *Small and Medium Enterprises (SMEs) in delivering energy services.* ESMAP provided support to improve regulations, enhance operations of rural electrification agencies, and train SMEs in order to foster favorable conditions for SMEs' involvement in energy services delivery in Laos, Cambodia, Peru, Bolivia, Haiti, Tanzania, Cameroun, and Burkina Faso.
- *Access planning.* ESMAP assisted governments of Rwanda and Kenya to develop plans to scale up electricity access. It supported the publication of background papers for the development of the World Bank's energy strategy.
- *Gender dimensions in energy projects and strategies.* ESMAP has been supporting gender assessments, action plan development and gender training in Senegal, Mali, Tanzania, Benin, and Peru. It also supported the Gender and Extractive Industries Program of the World Bank's Oil, Gas, and Mining unit (SEGOM).
- *Improved cookstoves and clean cooking fuels.* ESMAP funded pilots to disseminate cook stoves in Haiti, Uganda, and Rwanda. It is further supporting the development of a toolkit for designing and disseminating improved cook stoves in Central America.
- *Regional Initiatives.* ESMAP supported the development of the Lighting Africa and the Africa Electrification Initiative and is co-funding the expansion of both initiatives. Lighting Africa aims to mobilize the private sector to provide reliable and affordable lighting to 250 million people, while the Africa Electrification Initiative's objective is to create and sustain a living body of practical knowledge and a network of Sub-Saharan African practitioners in electrification.

### 3.2 ESMAP'S PORTFOLIO OF ENERGY ACCESS ACTIVITIES (FY2009-11)

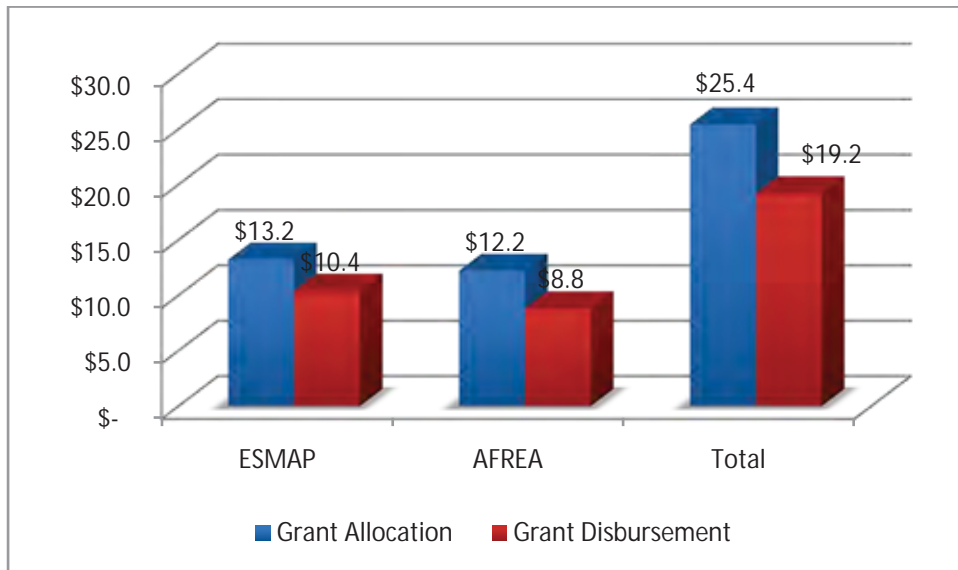
ESMAP's FY2009-11 Energy Access portfolio comprises 55 activities<sup>12</sup> implemented mostly by World Bank regional energy units, with the Africa energy unit having the largest share. Total grant allocation for activities under the energy access portfolio was \$ 25.4 million with total disbursements of about \$19.2 million<sup>13</sup> (Figure 16).

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<sup>12</sup> As of June 30<sup>th</sup>, 2011

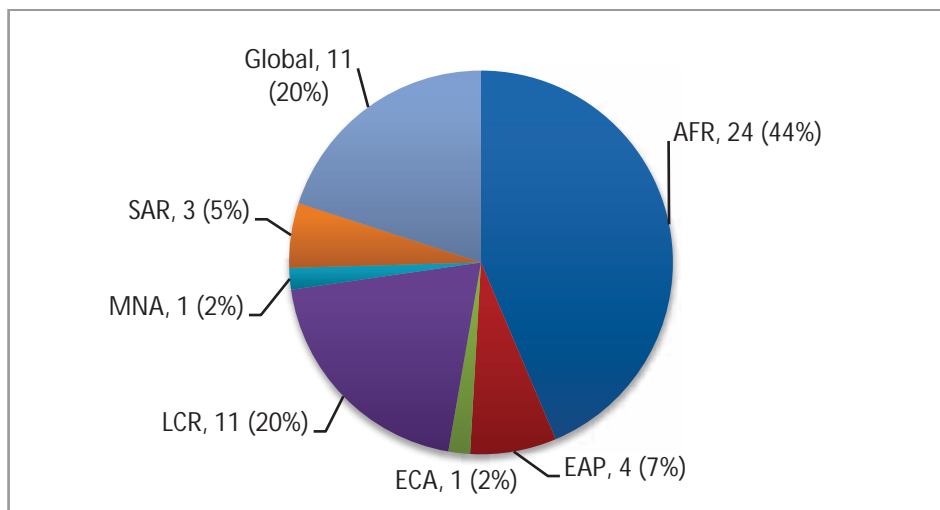
<sup>13</sup> As of end of March 2012

Figure 16 – Energy Access Portfolio Grant Allocations and Disbursements (as of March 2012) (\$ Million)



Of the 55 activities, the Africa Energy unit (AFTEG) implemented 24 activities (12 through AFREA, 2 through ABGs, and 10 through both AFREA *and* ABGs), followed by the Latin America and Caribbean with 11, East Asia and Pacific with four, South Asia with three, and finally the Europe and Central Asia and the Middle East and North Africa regions with only one activity; 11 activities (Global) were carried out by World Bank’s Energy Department, seven of which are own-managed by ESMAP (Figure 17).

Figure 17 – ESMAP Energy Access Activities by Region



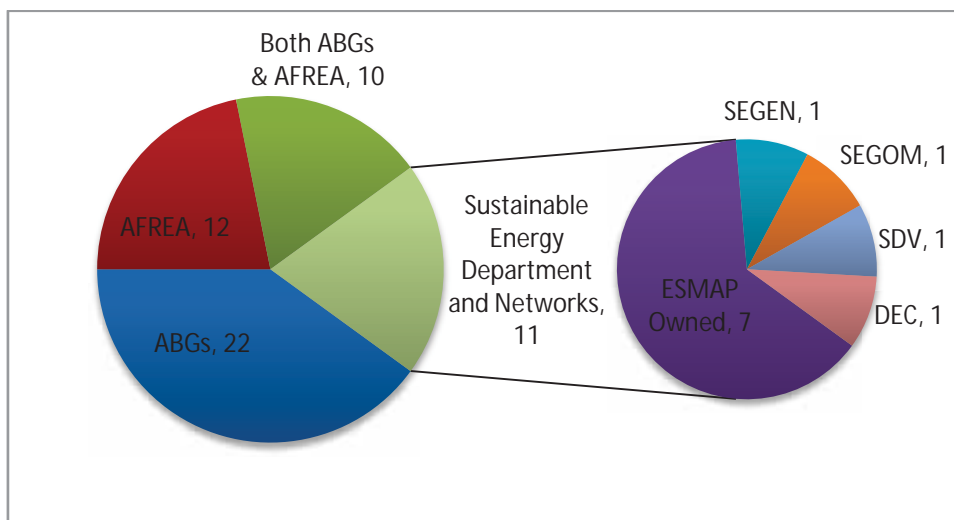
AFR: AFRICA, EAP: EAST ASIA AND Pacific, ECA: Europe and Central Asia, LCR: Latin America and Caribbean, SAR: SOUTH ASIA

AFTEG’s largest share reflects the tremendous energy access challenges that Sub-Saharan African countries face and includes the Africa Renewable Energy Access (AFREA) program<sup>14</sup>, one of ESMAP’s financing windows dedicated for Sub-Saharan Africa. It funded 12 activities separately and provided

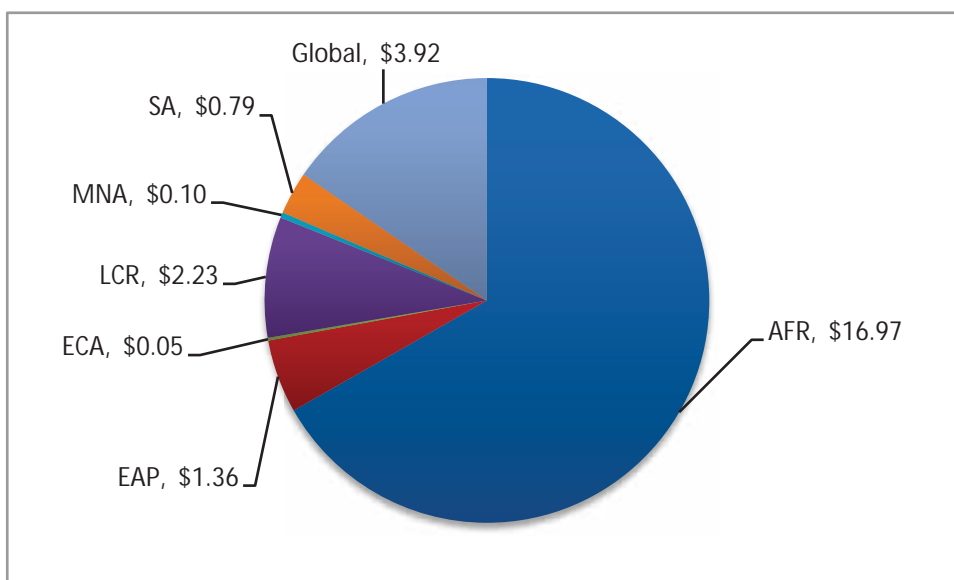
<sup>14</sup> The Ministry of Foreign Affairs (DGIS) of The Kingdom of Netherlands allocated US\$ 28.75 million equivalent fund to the ESMAP Clean Energy Investment Framework Multi-Donor Trust Fund (ESMAP CEIF-MDTF) to support deployment of renewable energy systems in Sub-Saharan Africa. ESMAP and AFTEG signed a Fund Notification agreement on February 3, 2009 under which ESMAP made the funds earmarked for the AFREA Program and available to AFTEG through a child trust fund - the AFREA Trust Fund (TF080138).

additional funding to 10 activities funded under the Annual Block Grants (ABGs), the main financing window through which ESMAP funds all regional energy units (Figure 18). Grant allocation for each of the regions is shown in Figure 19.

**Figure 18 – Number of ESMAP Energy Access Activities by Implementing Unit**



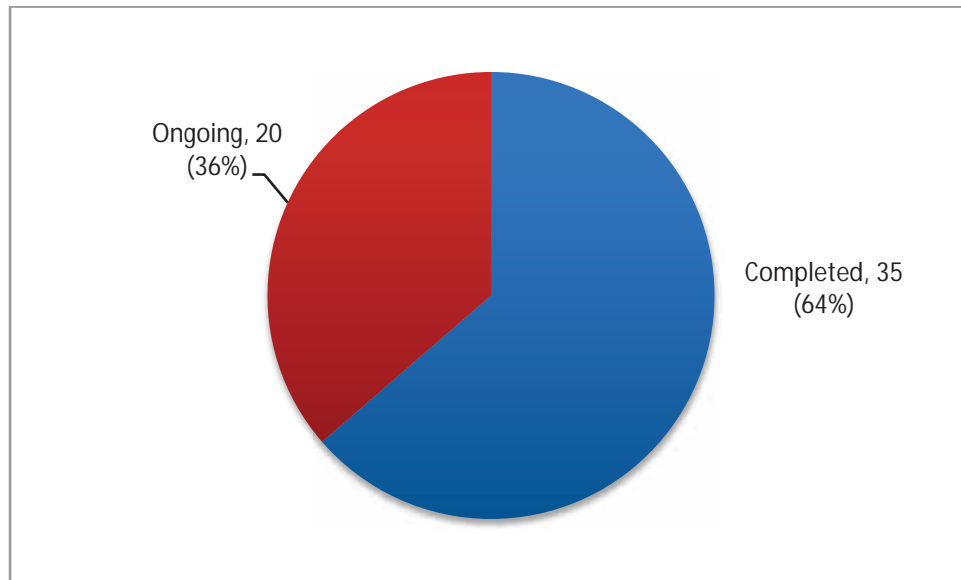
**Figure 19 – Grant Allocation by Region under Energy Access Portfolio (\$ Million)**



AFR: AFRICA, EAP: EAST ASIA AND Pacific, ECA: Europe and Central Asia, LCR: Latin America and Caribbean, SAR: SOUTH ASIA

Of the total 55 activities under the energy access portfolio, 35 (64%) have been completed and delivered to clients and 20 (36%) are still ongoing (Figure 20). Although most ongoing activities have not yet delivered final outputs and therefore it is premature to discern results, some have been included as part of assessment as they documented early noticeable outcomes.

Figure 20 - ESMAP Energy Access Activities by Status



### 3.3 ASSESSMENT OF OUTCOMES AND RESULTS

The assessment provided evidence that 60 outcomes were achieved under the energy access portfolio. Results were especially notable under the Policy or Strategy Informed and Development Financing Informed outcomes confirming the important role of ESMAP in catalyzing funds and providing key advisory services in support of sector policies and promoting energy investments in developing countries.

Figure 21 below shows the number and percentage of outcomes observed under the EA portfolio by outcome type. Figure 22 provides a breakdown of number outcome measured by type of indicator. Refer to Annex 1 for details of outcomes achieved under each of activities in the EA portfolio.

Figure 21 – ESMAP Energy Access Activities by Outcome Type

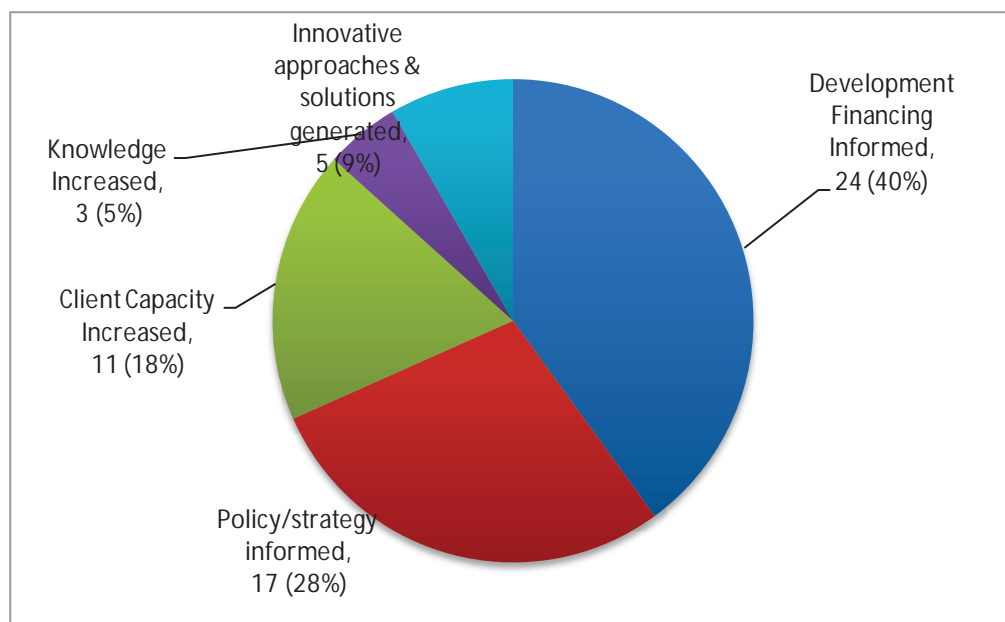


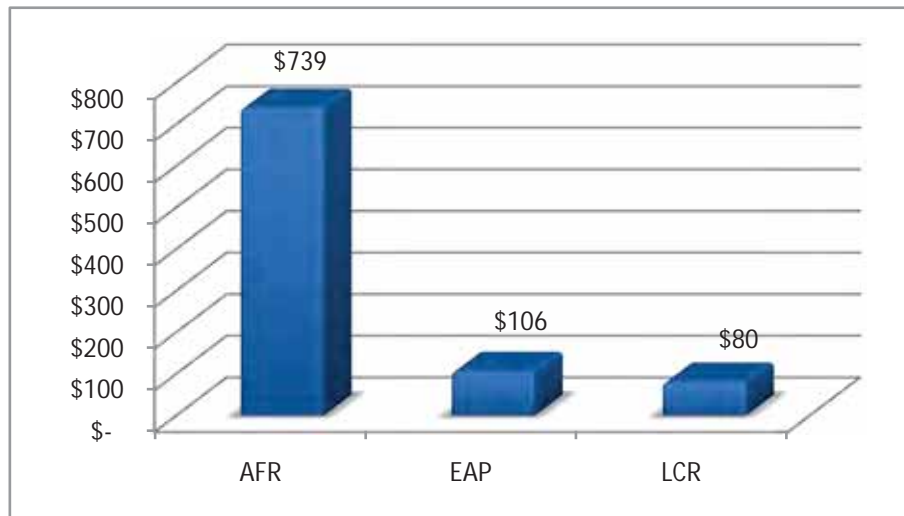
Figure 22 – Number of Outcomes Observed under Energy Access Portfolio by Indicator Type

Outcomes and Indicators	No. of Outcomes Achieved by Indicator Type
<b>1. Development Financing Informed</b>	
1.1 Preparation of new operation informed	10
1.2 Existing operations informed	7
1.3 Mobilization of non-Bank resources informed	7
1.4 Government expenditure informed	0
<i>Subtotal Outcome 1</i>	<i>24</i>
<b>2. Policy/strategy Informed</b>	
2.1 Government policy/strategy informed	7
2.2 Public debate stimulated/initiated	1
2.3 Contributed to stakeholder involvement	1
2.4 Dev't community/partner policy/strategy informed	2
2.5 Bank country strategy (CAS/CPS) informed/influenced	2
2.6 Bank sector strategy informed/influenced	4
<i>Subtotal Outcome 2</i>	<i>17</i>
<b>3. Client Capacity Increased</b>	
3.1 Design capacity strengthened	0
3.2 Implementation capacity strengthened	10
3.3 Monitoring & Evaluation capacity increased	1
3.4 Clients are recognized with good practice or similar awards	0
<i>Subtotal Outcome 3</i>	<i>11</i>
<b>4. Knowledge Increased</b>	
4.1 Facilitated exchange of best practice with clients	3
4.2 Facilitated exchange of best practice with partners	0
4.3 Disseminated best practices	0
<i>Subtotal Outcome 4</i>	<i>3</i>
<b>5. Innovative approaches &amp; solutions generated</b>	
5.1 New innovative approach fostered	0
5.2 New innovative approach developed	5
5.3 Client is able to adopt/harness new technologies, innovative ideas, know-how.	0
<i>Subtotal Outcome 5</i>	<i>5</i>

**Outcome 1 - Development Financing Informed:** 24 outcomes (achieved by 18 EA activities) provided evidence of influencing World Bank Group lending operations of about \$ 925 million<sup>15</sup>; \$739 million alone (81%) influenced loans in the Africa region (Figure 23). It is noteworthy to mention that the influenced amounts include financing from the climate investment funds, namely CTF, SREP, and FIP.

<sup>15</sup> This amount excludes World Bank loans currently in pipeline and loans influenced by ESMAP activities but already approved during fiscal year 2012.

Figure 23 – Amount of World Bank Group Lending Influenced by ESMAP FY09-12 Energy Access (\$ Million)



ESMAP's influence on energy investments for improved access to energy was notable in the following countries:

- *Rwanda & Kenya*: ESMAP helped develop energy access plans, whose implementation was supported by \$400 million loans from the World Bank and a \$1.5 billion commitment from donors.
- *Haiti*: ESMAP's assistance provided the Ministry of Public Works, Transport and Communication with coordinators on household energy and rural electrification, who are key members of a team preparing a \$100 million energy access project to be financed by the World Bank.
- *Laos*: ESMAP supported the Ministry of Energy and Mines to prepare the operational manual of a Rural Electrification Fund (REF). The support enabled the fund to be operational under a subsequent World Bank-financed rural electrification project of \$ 25.7 million.

**Outcome 2 - Policy/Strategy Informed:** 17 outcomes were observed to have influenced World Bank and government strategies and policies. Out of these, five outcomes provided evidence of influence on World Bank Country Assistance Strategies (CAS), with notable cases in Rwanda and Kenya, where energy access plans developed with ESMAP funding were further supported in subsequent country assistance strategies. Also, the World Bank's renewed focus on household energy was induced by ESMAP-funded background papers that were issued as part of the preparation of the World Bank Energy Strategy. Besides the influence on World Bank strategies, other activities' outputs have informed regulations, tariffs, and policies developed by eight developing country governments. Noteworthy examples include the following:

- ESMAP assisted Tanzania to develop standardized power purchase agreements and simplified regulatory procedures that facilitated the involvement of small power producers in electricity generation.
- The South African Government adopted ESMAP-recommended reverse auction mechanism to set up feed-in-tariffs for electricity generated from renewable sources.
- Peru's electricity sector regulator established a tariff band for individual PV systems within the national tariff framework based on ESMAP-supported analysis.
- The Ethiopian government removed duties on all off-grid lighting products that meet or exceed Lighting Africa-recommended performance targets, following a study carried out under the Lighting Africa Initiative and supported by both AFREA and ESMAP.

**Outcome 3 - Client Capacity Increased:** 11 outcomes contributed to strengthening the capacities of client agencies to design, implement, and monitor programs and projects. Agencies whose capacities were strengthened include (1) Liberia's rural and renewable energy agency of Liberia (RREA), (2) Mali's Rural Electrification and Household Energy Agency (AMADER), (3) Peru's agency implementing the rural electrification project, (4) Bolivia's largest electricity transmission company (TDE), (5) the International Institute for Water and Environmental Engineering (2IE) in Burkina Faso, and (6) The Energy Center at the Kwame Nkrumah University of Science and Technology (TEC/KNUST) in Ghana.

**Outcome 4 - Knowledge Increased:** The majority of ESMAP energy access activities have deepened clients' knowledge and led to other outcomes described above. However, three outcomes provided evidence of best practices, new knowledge, or dissemination workshops involving clients and partners, thereby facilitating exchange of best practices, and resulting into deepened client knowledge: (1) The Africa Electrification Initiative project facilitated the dissemination of best practices in designing and implementing rural electrification projects in Sub-Saharan Africa, (2) The Benchmarking Analysis of Electricity Distribution Center project overhauled an existing database on electricity distribution utilities in the LAC region and added information on new utilities, expanding the database coverage from 70 percent of the electricity connections in the region to 89 percent, and (3) The findings from project Addressing Indoor Air Pollution were used as part of the development of a household energy program in Bangladesh.

**Outcome 5 - Innovative Approaches & Solutions Generated:** Five outcomes yielded innovative solutions that have been widely disseminated. Lighting Africa (LA) has developed the first-ever universally applicable quality standards and testing methods for off-grid lighting products. In Tanzania, ESMAP helped develop light-handed licensing and power purchase agreements, which have been disseminated at regional workshops sponsored by the Africa Electrification Initiative. In Rwanda and Kenya, ESMAP promoted the use of geographic information tools in planning on-grid and off-grid electrification.

## 3.4 HIGHLIGHTED PROJECTS



**ESMAP ACTIVITY: CATALYZING RENEWABLE ENERGY IN RURAL LIBERIA**  
**COUNTRY / REGION: LIBERIA / AFRICA**

### Overview

Prior to AFREA support, Liberia has been rebuilding slowly from a series of civil wars that had led to a complete destruction of the country's energy infrastructure. Less than 1.5 percent of residents in Monrovia, the capital city, and no rural inhabitants have access to publicly provided electricity. The vast majority of the population relies on kerosene, candles, firewood, charcoal, and small gasoline and diesel generators to meet their energy needs such as lighting, air conditioning, refrigeration, and cooking.

In an effort to increase access to electricity from renewable energy sources, AFREA provided technical and legal services to the Ministry of Lands, Mines, and Energy (MLME) to help set up and build the capacities of a dedicated energy agency whose mandate will be to mobilize financing and renewable energy services for rural areas.

### Scope & Recommendations

AFREA's support resulted in President Ellen Johnson Sirleaf issuing an Executive Order establishing a Rural and Renewable Energy Agency (RREA) and its associated Rural Energy Fund as a legal entity, in January 2010. Subsequently, the agency was staffed and trained on renewable energy technologies,



annual plan development, and use of GIS-based tools for energy planning. The RREA was further supported to develop its financial, procurement, and operational manuals. AFREA funds also enabled the RREA to undertake two pilot projects (micro-hydro and solar market facilitation), which will provide modern energy services to the recipient communities while enabling the agency to learn-by-doing, enhancing its capacities for implementing future larger programs.

### Observable Results and Outcomes

- Client capacity increased: Support from the Africa Renewable Energy Access program (AFREA) has improved Liberia's institutional capacity to provide modern renewable energy services for rural areas. With the enhanced capacity, the RREA has begun preparing a rural energy master plan. It held a stakeholders workshop that identified rural energy priorities, which led to an outline of a rural electrification strategy and to a draft action plan. With the workshop outputs, the RREA applied for and received a 1.5 million Euros grant from the European Union, in August 2011, to pilot off-grid solar lighting activities in Lofa County and complete the rural energy master plan. In addition, PPIAF resources were leveraged to bridge the financing gap for the master plan. The plan will include a spatial analysis of grid extension and priority stand-alone renewable systems for remote villages, using GIS technologies.
- Sustainability. By the end of 2011, the RREA has become fully operational, and was allocated a government budget. The next step will be the official ratification of the legislation pertaining to the RREA by parliament. The capacity of the RREA will be further strengthened through a GEF grant that was approved by the World Bank's Board in January 2012 entitled "Lighting Lives in Liberia." The aim of the grant is to provide modern solar lighting products in exchange for kerosene lanterns.



**ESMAP ACTIVITY: A M&E TOOL TO BETTER DEMONSTRATE ENERGY ACCESS RESULTS**  
**COUNTRY / REGION: NEPAL / SOUTH ASIA**

### Overview

AEPC is Nepal's primary institution dedicated to develop and promote renewable and alternative energy technologies. It has been implementing a program of projects encompassing micro/mini-hydro, solar energy, water mills, biogas, and improved cook stoves. Most of its program is donor funded and the institution has been facing growing pressure to demonstrate the relationship between financial and technical inputs with physical outputs and long-term welfare outcomes.

### Scope & Recommendations

ESMAP, through the World Bank's energy unit in the South Asia region supported a technical assistance activity that contributed to increase the capacity of the Nepalese Alternative Energy Promotion Center (AEPC) to establish a M&E framework to monitor and evaluate its renewable energy program. The M&E framework incorporates key performance indicators covering the results chain of projects: from inputs to impacts through outputs and outcomes.

The framework is supported by a web-based Management Information System (MIS) that will regularly generate reports and dashboards based on monthly and quarterly program data. In addition, a baseline survey of beneficiary outcomes was carried out against which future improvements can be measured. A detailed operational manual of the M&E system for both users and administrators was developed and a number of training sessions was organized for the AEPC's M&E cell.



## Observable Results and Outcomes

- Client Capacity Increased: ESMAP's support enabled AEPC to establish priorities, set targets and allocate resources. The system-generated reports allow AEPC to make informed decisions and devise appropriate solutions. At the activity completion, AEPC was equipped with not only a state-of-the-art monitoring system to track progress and demonstrate the impacts of its program but also with trained staff who can sustainably manage and update the system, as required.



**ESMAP ACTIVITY:** LIGHT-HANDED POWER PURCHASE AGREEMENTS  
**COUNTRY / REGION:** TANZANIA / AFRICA

### Overview

On average, nearly eight out of ten Tanzanians lack access to electricity. Rural Tanzanians are more deprived with less than 2% having electricity. Such a low electricity access rate contrasts with abundant renewable energy resources including small hydro, wind, solar and various forms of biomass. The renewable resources can be tapped to produce electricity with a suitable regulatory framework that promotes the involvement of local and private investors in electricity generation and supply.

### Scope & Recommendations

ESMAP assisted the Tanzanian Energy and Water Utilities Regulatory Authority, EWURA, to develop light-handed power purchase agreements for projects under 10MW and simplified regulatory procedures for projects under 1 MW. The agreements and procedures paved the way for involving local and foreign operators in electricity generation and supply in rural areas.

This pioneering work done in Tanzania with ESMAP assistance has been disseminated for possible adoption to other African countries. It was presented at the African Electrification Initiative launch workshop, in Maputo, attended by 130 representatives from African ministries of energy, electricity utilities, regulatory entities, and rural electrification agencies. The Tanzanian SPP regulatory system was also presented to electricity regulators from 10 Southern African countries at the 2009 annual meeting of the Regional Electricity Regulatory Association of Southern Africa.

## Observable Results and Outcomes

- Enhanced regulatory framework: EWURA formally adopted, in 2009, the power purchase agreements (PPAs) and simplified tariff setting mechanisms. It further expanded on this initial work by developing guidelines for Small Power Producers (SPPs). The favorable regulatory framework for SPPs has been enhanced through the World Bank-financed Energy Development and Access project.
- Increased power generation by private operators. Under the enhanced framework, five standardized power purchase agreements have been signed with the national utility, TANESCO, for 24 MW and four letters of intent have been concluded for estimated sales of 17.8 MW. Two projects with commitment to supply 10.4 MW are selling power to TANESCO. Among the small power projects being developed are (1) the Kilocho project, which will produce and supply 12 MW of electricity to 1,500 rural households and supply 9MW to the national grid, and (2) the Mbinga Mtambazi hydro project, which will supply about 500 KW of electricity to 900 households in three off-grid villages.

## 4 | ENERGY EFFICIENCY

### 4.1 INTRODUCTION

Energy efficiency comprises supply side and end-use thermal and electricity efficiency improvement activities. Examples include efficiency improvements in industry, transport, buildings, and appliances; power generation rehabilitation, loss reduction in transmission and distribution, and improvements in the efficiency of heating systems. Hydropower rehabilitation projects are classified as energy efficiency when energy output is increased as a result of the investment with no increase in rated capacity of the installation<sup>16</sup>.

In response to demand from client countries, the World Bank has substantially increased financing for energy efficiency initiatives in recent years, while also providing analytical support for governments that are developing low-carbon energy plans. As of end 2010, energy efficiency projects accounted for about 20 percent of the World Bank's total energy sector lending<sup>17</sup>. Energy efficiency financing and implementation is delivered through several models including utility demand-side management, energy service companies, innovative financing structures, market transformation and household appliance standards, as well as incentives, subsidies and grants. Energy efficient lighting, replacing incandescent lamps with compact fluorescent light bulbs (CFLs) is at the core of demand side management.

#### ESMAP'S ENERGY EFFICIENT CITIES INITIATIVE (EECI)

In October 2008, ESMAP launched the five-year Energy Efficient Cities Initiative (EECI) to promote energy-efficient programs and planning among cities in developing countries. EECI was launched following a Practitioners Roundtable, co-hosted by the World Bank's Urban Anchor in October 2008, which brought together client cities, potential partners and other practitioners to share experiences and identify knowledge gaps. Based on the feedback from the Roundtable, along with discussions with World Bank urban staff and several potential global partners, a 5-year EECI plan was developed and presented in December 2008 at the ICLEI Local Government Climate Session side event at COP-14 in Poznan, Poland. The EECI program is specially designed to help mainstream and scale-up sustainable energy actions (such as EE) and climate change mitigation considerations in the urban context. It aims to help city mayors, planners and administrators make better informed decisions, across six key sectors – buildings, water, transport, public lighting, solid waste and heating and power.

### 4.2 ESMAP'S PORTFOLIO OF ENERGY EFFICIENCY ACTIVITIES (FY2009-11)

ESMAP's FY2009-11 energy efficiency portfolio comprises 37 activities<sup>18</sup> implemented by both the World Bank regional departments through the Annual Block Grants (ABGs) and the World Bank's Sustainable Energy Department (SEG). Total grant allocation for activities under the EE portfolio was \$6.7 million with total disbursements of about \$5.2 million<sup>19</sup> (Figure 24).

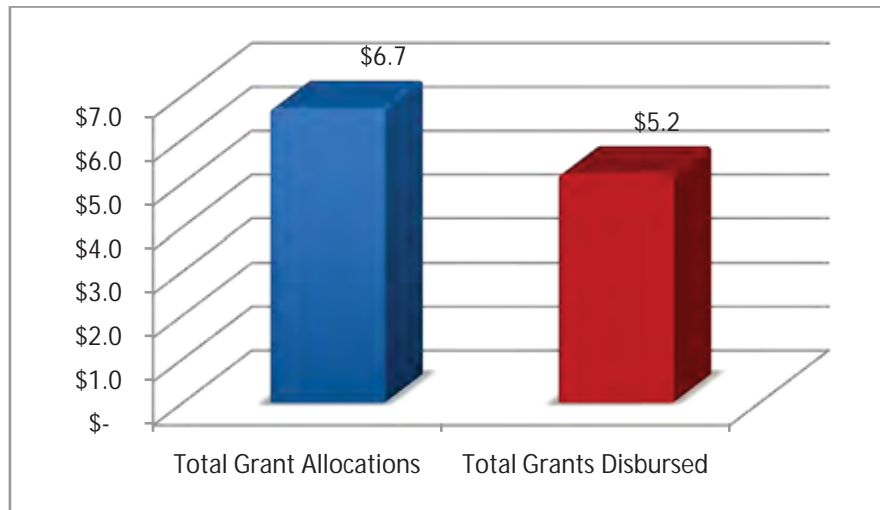
<sup>16</sup> "Renewable Energy & Energy Efficiency Financing by World Bank Group Hits All Time High" – Press release No. 2010/057/WBG, September 2009.

<sup>17</sup> "Energy Efficiency: Saving Money, Stopping Emissions a Win-win" – Featured Story: Sustainable Development Network, December 2010.

<sup>18</sup> As of June 30<sup>th</sup>, 2011

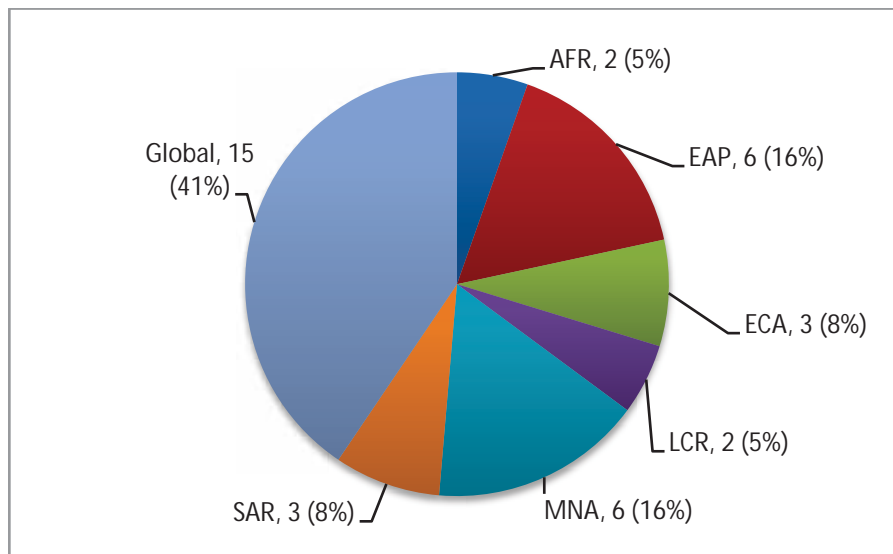
<sup>19</sup> As of end of March 2012

Figure 24 - Energy Efficiency Portfolio Grant Allocations and Disbursements (as of March 2012) (\$ Million)



There are 22 activities implemented by Regions through ABGs, and 15 (Global activities) implemented by the Bank's Energy Department, 11 of which are directly own-managed by ESMAP. The largest number of EE activities was implemented in the Middle East and North Africa and East Asia and Pacific regions each with six activities, followed by Europe and Central Asia and South Asia each with three activities, and Latin America & Caribbean with two and Africa with 2 (Figure 25 and 26). Grant allocation for each of the regions is shown in Figure 27.

Figure 25 – Number of ESMAP Energy Efficiency Activities by Region



AFR: Africa, EAP: East Asia and Pacific, ECA: Europe and Central Asia, LCR: Latin America and Caribbean, SAR: South Asia

Figure 26 – ESMAP Energy Efficiency Activities by Implementing Unit

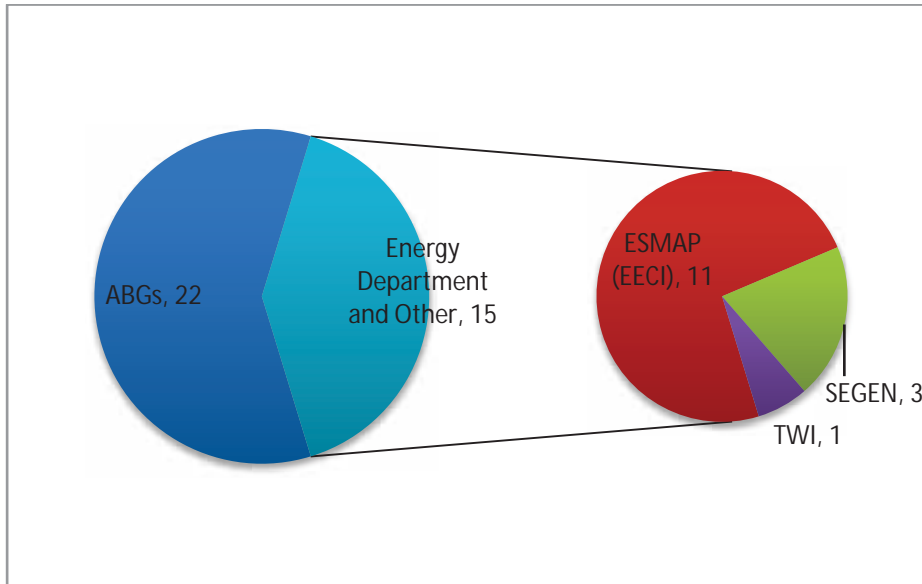
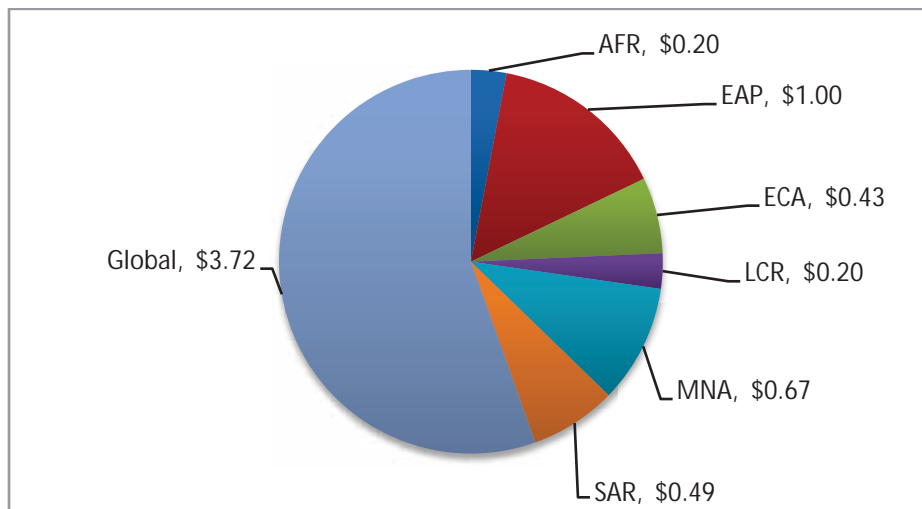
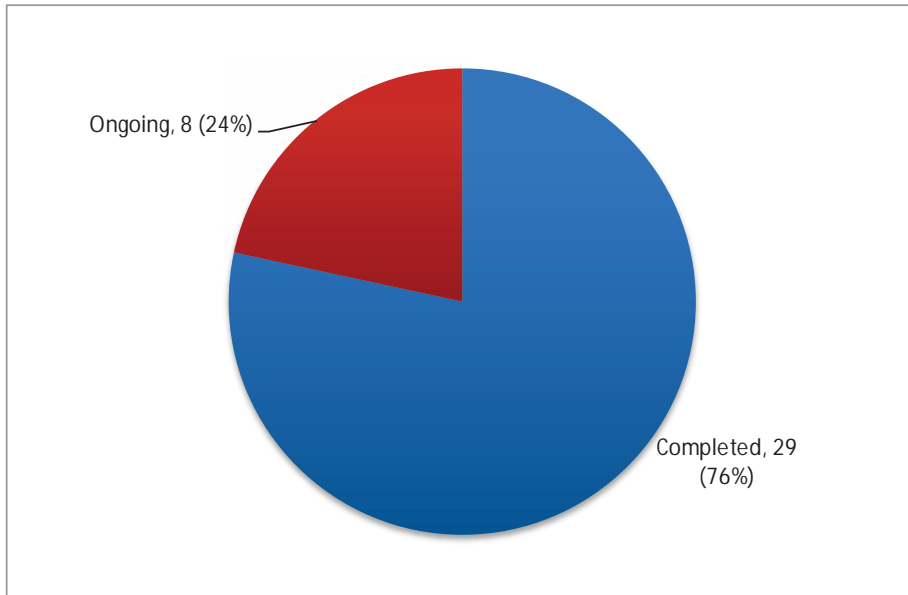


Figure 27 - Grant Allocation by Region under Energy Efficiency Portfolio (\$ Million)



Of the total 37 activities under the energy efficiency portfolio, 29 (76%) have been completed and delivered to clients and 8 (24%) are still ongoing (Figure 28). Although most ongoing activities have not yet delivered final outputs and therefore it is premature to discern results, some have been included as part of assessment as they documented early noticeable outcomes.

Figure 28 – ESMAP Energy Efficiency Activities by Status



### 4.3 ASSESSMENT OF OUTCOMES AND RESULTS

The assessment provided evidence that 31 outcomes were achieved under the energy efficiency portfolio. Results were especially notable under the Policy or Strategy Informed and Development Financing Informed outcomes confirming the important role of ESMAP in catalyzing funds and providing key advisory services in support of sector policies and promoting energy investments in developing countries.

Figure 29 below shows the number and percentage of outcomes observed under the EE portfolio by outcome type. Figure 30 provides a breakdown of number outcome measured by type of indicator. Refer to Annex 1 for details of outcomes achieved under each of the EE activities.

Figure 29 – ESMAP Energy Efficiency Activities by Outcome Type

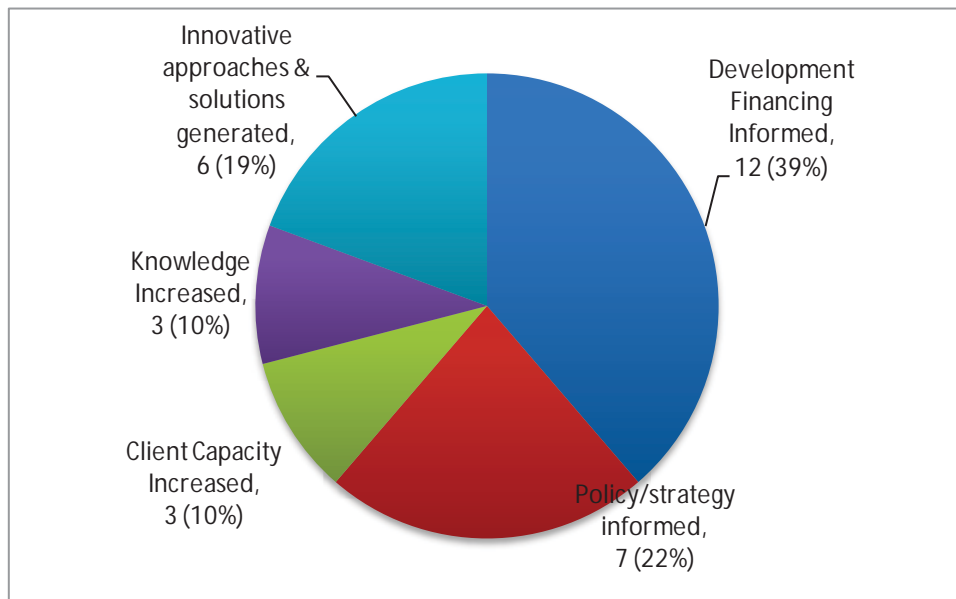




Figure 30 – Number of Outcomes Observed under EE Portfolio by Indicator Type

Outcomes and Indicators	No. of Outcomes Achieved by Indicator Type
<b>1. Development Financing Informed</b>	
1.1 Preparation of new operation informed	8
1.2 Existing operations informed	3
1.3 Mobilization of non-Bank resources informed	1
1.4 Government expenditure informed	0
<i>Subtotal Outcome 1</i>	<i>12</i>
<b>2. Policy/strategy Informed</b>	
2.1 Government policy/strategy informed	5
2.2 Public debate stimulated/initiated	0
2.3 Contributed to stakeholder involvement	0
2.4 Dev't community/partner policy/strategy informed	0
2.5 Bank country strategy (CAS/CPS) informed/influenced	1
2.6 Bank sector strategy informed/influenced	1
<i>Subtotal Outcome 2</i>	<i>7</i>
<b>3. Client Capacity Increased</b>	
3.1 Design capacity strengthened	2
3.2 Implementation capacity strengthened	1
3.3 Monitoring & Evaluation capacity increased	0
3.4 Clients are recognized with good practice or similar awards	0
<i>Subtotal Outcome 3</i>	<i>3</i>
<b>4. Knowledge Increased</b>	
4.1 Facilitated exchange of best practice with clients	2
4.2 Facilitated exchange of best practice with partners	0
4.3 Disseminated best practices	1
<i>Subtotal Outcome 4</i>	<i>3</i>
<b>5. Innovative approaches &amp; solutions generated</b>	
5.1 New innovative approach fostered	3
5.2 New innovative approach developed	2
5.3 Client is able to adopt/harness new technologies, innovative ideas, know-how.	1
<i>Subtotal Outcome 5</i>	<i>6</i>

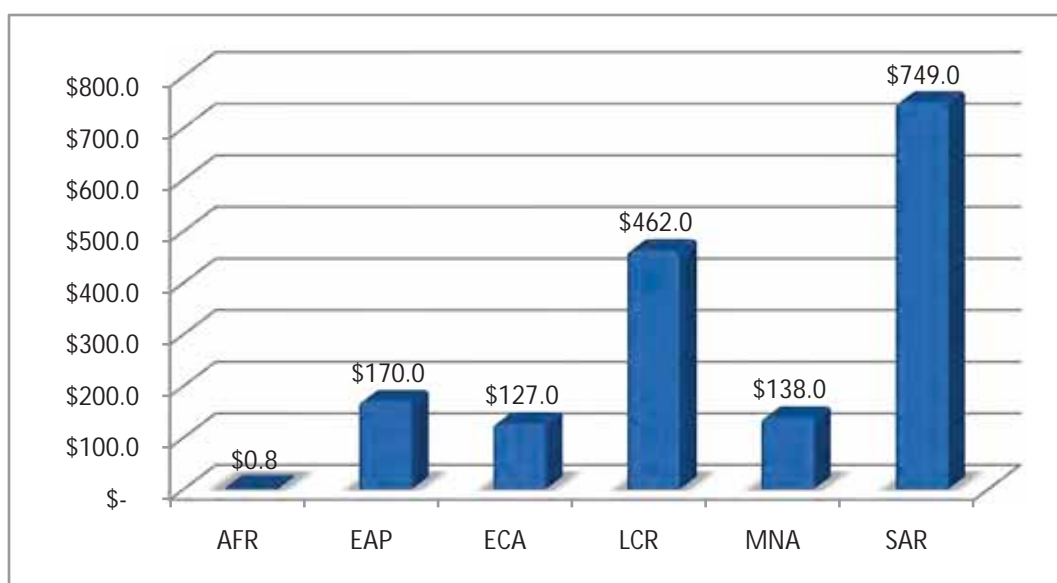
**Outcome 1 - Development Financing Informed:** A total of 12 outcomes (achieved by 12 EE activities) provided evidence of influencing and helping to mobilize, directly or indirectly, about \$1.6 billion<sup>20</sup> in financing from the World Bank. Influenced lending was highest in the South Asia region with about \$749 million, followed by the Latin America and Caribbean region with \$462 million (Figure 31).

Some examples where ESMAP's influence was important in helping catalyze funding through World Bank lending projects include:

<sup>20</sup> This amount excludes World Bank loans currently in pipeline and loans influenced by ESMAP activities but already approved during fiscal year 2012.

- In *Bangladesh*, ESMAP's technical assistance in support of the Energy Efficiency and Cleaner Technology in Brick Making in Bangladesh (P111240) helped estimate private and social profitability of selected brick making technology and helped inform a key component of the Clean Air Sustainable Environment (CASE) Project financed by the IDA.
- The approach described under ESMAP's Smart Meters project is explicitly reflected in the design of the advanced metering infrastructure (AMI) components of several Bank lending operations in *Latin America and Africa*.

Figure 31 – World Bank Lending Influenced by ESMAP FY09-12 EE Activities by Region (\$ Million)



**Outcome 2 - Policy/Strategy Informed:** Seven outcomes provided evidence that ESMAP energy efficiency activities implemented during FY09-FY12 have recommended, shaped and led to informed World Bank strategies and policies in client countries. These efforts have ranged from reviewing national heat regulations and regulatory frameworks for energy efficiency, to helping revise heating tariff methodologies and identifying saving opportunities in public buildings. Notable examples include:

- *Moldova:* Based on proposed reforms by ESMAP, the government agreed to transfer full district heating authority to the independent energy regulator (ANRE).
- *Lebanon:* the government incorporated plans for LNG re-gasification development in a key policy paper for the electricity sector in June 2010, based on ESMAP's assessment of the country's LNG supply.
- *Yemen:* Based on the Yemen's institutional framework for EE prepared by ESMAP, the government approved a national strategy for energy efficiency and renewable energy for the power sector.
- *Egypt:* ESMAP assisted policy makers to identify key barriers and best practices for promoting and improving energy efficiency.

**Outcome 3 - Client Capacity Increased:** Three outcomes demonstrated that EE activities enhanced capacity of clients to help them implement and adopt energy efficiency programs. In this regard, ESMAP has provided guidance to World Bank project team leaders, policy makers and public sector practitioners in the procurement of energy efficient services; helped municipalities assess and identify barriers and opportunities for energy efficiency, and helped client countries adopt and comply with building energy efficiency coding.



**Outcome 4 - Knowledge Increased:** While virtually all ESMAP energy efficiency activities have contributed to expanding and strengthening clients' knowledge and supported the achievement of other outcomes, two EECI's activities - *Energy Efficient Cities Small Grants (Quezon City)* and *Energy Efficiency Good Practice Database* - have been particularly effective in disseminating approaches and measures that cities in client countries have used to undertake efficiency improvements.

**Outcome 5 - Innovative Approaches and Solution Generated:** ESMAP has helped to introduce cutting-edge solutions and technologies to assist client countries to use energy more efficiently. Five outcomes achieved under ESMAP energy efficiency activities were identified as having introduced innovative solutions that have been widely disseminated. These include an operational toolkit for EE lighting to help practitioners benefit from experiences in designing and implementing large-scale residential CFL; the introduction and dissemination of a low-cost testing methodology of LED products in Africa; the applicability and option for applying a smart metering technology for public utilities; and TRACE, a city energy diagnostic tool developed to help cities quickly assess their EE performance.

## 4.4 HIGHLIGHTED PROJECTS



**ESMAP ACTIVITY:** TOOL FOR RAPID ASSESSMENT OF CITY ENERGY (TRACE)  
**COUNTRY / REGION:** GLOBAL

### Overview

The innovative city energy diagnostic tool, Tool for Rapid Assessment of City Energy (TRACE, previously named Rapid Assessment Framework) was developed to help cities quickly assess their energy efficiency performance, determine underperforming sectors and identify measures the city can take to make improvements and reduce energy cost. TRACE prioritizes sectors with significant energy savings potential, and identifies appropriate energy efficiency interventions across six sectors—transport, buildings, water and waste water, public lighting, solid waste, and power and heat. It is a simple, low-cost, user-friendly, and practical tool that can be applied in any socioeconomic setting. TRACE consists of two principal components: (i) a city energy benchmarking tool and (ii) a "playbook" of tried and tested energy efficiency interventions. These two components are woven into a user-friendly software application that takes the city through a series of sequential steps: from initial data gathering to a report containing a matrix of energy efficiency recommendations tailored to the city's individual context, with implementation and financing options.

### Scope & Recommendations

The computer based user-friendly tool was tested in Quezon City, the Philippines in March 2010, and proved effective in helping the Quezon City authorities assess their energy performance, determine underperforming sectors, and identify EE measures. The city officials envisioned organizing an interagency committee under the mayor's office to implement EE measures, which would include recommendations generated from TRACE.

TRACE has been utilized by the Bank's East Asia and Pacific region to help three cities in Vietnam, Indonesia and the Philippines assess their energy use and formulate long-term sustainable urban energy development strategies. TRACE was also piloted in the city of Gaziantep, Turkey with Bank's MNA region. Findings of the TRACE diagnosis will be used to prepare a Sustainable City Investment Program for Gaziantep, and opportunities for rolling out TRACE in other cities of Turkey will be explored during the implementation. TRACE is also being considered as the approach for developing city EE action plans

under the proposed Russia EE project. Looking ahead, ESMAP will discuss deployment of TRACE in other regions and disseminate the tool through global partners and in-country institutions.

### Observable Results and Outcomes

- Innovative approaches & solutions generated: TRACE offers better-informed solutions to make a city energy-efficient that helps reduce escalating energy costs on basic services. As a part of the capacity building exercise, ESMAP provided training of city local relevant authorities how the tool works and what it delivers. TRACE has a great potential to be adapted as an open resource, similar to many of the products the World Bank has delivered earlier. Both ECA and EAP regions have shown keen interest in implementing TRACE in a number of cities in their region. For example, under an AusAID project on Sustainable Urban Energy Program, TRACE has been deployed in three cities in East Asia namely, Danang (Vietnam), Cebu (Philippines), and Surabaya (Indonesia) with country teams.
- TRACE has been implemented in 14 cities in 13 different countries and has had substantial success. For instance in Turkey, TRACE informed the creation of the Sustainable Cities pillar in the US\$4.45 billion, 2012-2015 Country Partnership Strategy. In Indonesia, the WB used TRACE to conduct city-level case studies. Findings from the case studies are being used to create Energy and Emissions Sustainability Plan (EESP) Guidelines which will be distributed throughout the entire East Asia and the Pacific region. In Macedonia, TRACE has fed into the broader Green Growth Agenda, and is helping inform bank-financed Municipal Infrastructure Investment Project. In Georgia, TRACE results are contributing to the development of the Georgia's Municipal Development Fund, where a third generation of the fund will consider using a sustainable cities investment framework.



**ESMAP ACTIVITY: OPERATIONAL TOOLKIT FOR ENERGY EFFICIENCY LIGHTING (CFL TOOLKIT)**  
**COUNTRY / REGION: GLOBAL**

### Overview

In recent years, the World Bank Group (WBG) has been particularly active in responding to the growing demand for residential lighting programs as a means of reducing energy use, easing peak demands, mitigating environmental impacts, and easing the energy cost burdens to consumers. Since 1994, WBG-supported residential compact fluorescent lamp (CFL) programs have been completed or are ongoing in more than 20 countries. With this experience, the WBG and its Energy Sector Management Assistance Program (ESMAP) concluded there was a critical mass of operational documents and experience that would aid the design of new CFL-based residential energy efficiency programs in additional WBG member countries.

### Scope & Recommendations

ESMAP developed this “CFL Toolkit” to compile and share important operational (design, financing and implementation) elements, documents, lessons learned, results, and other relevant data into a user-friendly format. The Toolkit includes key implementation/operational aspects, such as economic analysis and financial analysis (including carbon financing), elements of program design, methodologies and survey instruments for market assessment and potential, procurement guidelines, technical specifications, bidding documents, consumer surveys, awareness campaign information, environmental and safety issues related to CFLs, program evaluations, and associated Terms of Reference for various

project activities. The overall goal of this toolkit is to review and synthesize the critical operational (design, financing and implementation) elements, including those related to carbon finance and GEF synergies from the experience of the Bank and other organizations, together in a user-friendly web-based format. The project is addressing CFL based programs primarily for the residential or small commercial markets.

The project was one of the recipients of the *2011 Sustainable Development Network (SDN) VPU Team Awards* because of its transformational impact in implementing large scale energy efficient lighting programs in several countries around the world by the Bank and by other partners leading to quick and significant energy efficiency gains, changed consumers' behavior, and reduction in GHG emissions.

### Observable Results and Outcomes

- Development financing informed: The CFL toolkit has informed key components of two Bank lending operations – the Mexico EE Lighting and Appliances GEF Project and the Additional financing for the Bangladesh Rural Electrification and Renewable Energy Development (RERED). The CFL Toolkit was also being used by IFC for an investment project in India and has been used by external partners, such as the UK's (DFID) in helping design CFL programs in Malawi. The United Nations Environment Programme (UNEP) has also referred to the Toolkit under their en.lighten initiative announced in Cancun, Mexico in 2010.
- Innovative approaches & solutions generated: the toolkit helped practitioners benefit from experiences in designing and implementing large-scale, residential compact fluorescent lamp (CFL) programs around the world. The toolkit shares the critical operational documents of CFL-based EE lighting programs (e.g., cost-benefit analysis, Terms of References and bidding documents), in a user-friendly web-based format. The value of this work was clearly demonstrated during and after the development of the CFL Toolkit.



**ESMAP ACTIVITY:** EE AND CLEANER TECHNOLOGY IN BRICK MAKING IN BANGLADESH (P111240)  
**COUNTRY / REGION:** BANGLADESH / SOUTH ASIA

### Overview

This ESMAP study estimated the private and social profitability of selected brick technologies and to provide concrete recommendations for their adoption in Bangladesh. Under the activity, ESMAP partially financed the demonstration projects comprising (i) introducing internal fuel in the green bricks, (ii) introducing semi-mechanized brick making which allow use of internal fuel, (iii) adopting better operating practices in the firing, (iv) improvements in existing designs and (v) introducing alternative technologies such as the Vertical Shaft Brick Kiln (VSBK).

### Scope & Recommendations

Partially through the ESMAP study, Bangladesh's Department of Environment (DOE) is now well informed of the huge potential benefit that carbon credits can bring in when switching to cleaner technologies. DOE has already agreed with the World Bank to prepare a potential Carbon Finance project linked with the new energy-efficient kilns to be piloted under CASE to help the entrepreneurs to reap the carbon benefit. Furthermore, the Asian Development Bank (ADB) has approached the World Bank seeking for more technical support on preparation of a new lending project for the brick sector of Bangladesh and possible collaboration with both the Bank and UNDP on the Brick Technology and Information Center in Bangladesh.

## Observable Results and Outcomes

- Development financing informed: The activity was very closely linked with and extremely informative to the brick components of the Clean Air Sustainable Environment (CASE) Project financed by the IDA (P098151, \$62 M).
- Policy/Strategy informed: Key policy recommendations in the study are being taken into serious consideration by the Government of Bangladesh to incorporate into the country's new regulatory framework, which includes the establishment of a Brick Information and Technology Center (for which the tender has just recently been launched). In addition, the ESMAP funded study analyzed the development of the brick industry in China. Through this example, concrete recommendations were made to introduce hollow bricks and alternative raw brick materials in 5 HHK and 2 tunnel kilns (funded by CASE).
- Innovative approaches & solutions generated: This ESMAP study piloted an innovative energy-efficient, clean technology called Vertical Shaft Brick Kiln (VSBK) for the brick sector in Bangladesh. After successful implementation of the pilot of the study and the demonstration of its environmental and financial benefits, the demand of the new technology has exponentially increased. A recent dissemination workshop of the study in Dhaka (September 2011) was well accepted and attracted the attention from the national media, several multilateral development organizations and international agencies. Thanks to the lessons learnt during this pilot, there are currently 7 more VSBK being installed in Bangladesh (through the CASE project).

### 5.1 INTRODUCTION

Clean Energy - Bringing together ESMAP's work on Renewable Energy, Low Carbon and Climate Adaptation

To respond to the requests for support from client countries to mainstream long-term green growth promotion, low carbon development planning and the immediate needs related to renewable energy investments and policies design and implementation, *in FY2012 ESMAP consolidated its efforts under a new Clean Energy program.*

Clean energy sources are increasingly attractive for many reasons, including supply diversification, increased energy independence, fostering new industries, reducing air and water pollution, and contributing to global efforts to reduce greenhouse gas emissions. There has been a surge in World Bank lending to low carbon energy projects, reaching US\$5.9 billion in FY2011, and a corresponding increase in demand for the analytical work and technical assistance that ESMAP helps provide to support policy development and upstream investment preparation.

This portfolio review captures activities across the Clean Energy theme, noting outcomes achieved under the Renewable Energy Market Transformation Initiative (REMTI), the Low Carbon Growth program and the initial work on Energy and Climate Adaptation.

Recent key achievements of the Clean Energy program include:

- Delivered country-specific “market transformation” strategies to help plan for large-scale integration of renewable energy for India, Peru and Mexico.
- Produced flagship report, *Climate Impacts on Energy Systems*, a comprehensive look at the potential impacts of climate trends and weather variability on energy resources, infrastructure and demand.
- Contributed to international efforts to scale up concentrated solar power in the Middle East and North Africa that are expected to accelerate local manufacturing, entrepreneurship, and job creation.
- Produced Low Carbon Growth Studies for South Africa, India and Poland that identify greenhouse gas mitigation opportunities and the financial, technical and policy requirements for transition to a low carbon development path.
- Launched HEAT, the Hands-on Energy Adaptation Toolkit, which provides step-by-step guidance for practitioners to conduct risk assessment of climate vulnerabilities and adaptation options for a country's energy sector.

## A Look Back: FY2009-11 Focus on Renewable Energy, Low Carbon and Climate Adaptation

**Low Carbon Growth Studies Program** - In 2007, the low carbon growth country studies were initiated in 5 countries (Brazil, China, India, Mexico and South Africa) in response to a G8 discussion on the Clean Energy Investment Framework. The program was subsequently expanded to include Indonesia and Poland. These studies, funded with support from DFID, helped to define development goals and priorities and greenhouse gas (GHG) mitigation opportunities, and examine the benefits and costs of low carbon growth. The studies have had impact on the development of new and existing World Bank lending and government policy and capacity development, as detailed in this review. The studies form the basis for the low carbon activities and a related knowledge program that has been initiated to share the emerging results, lessons, tools and experience from this program.

**Renewable Energy Market Transformation Initiative (REMTI)** - In 2009, ESMAP established REMTI to help countries address the preparatory work needed in the earlier stages of program development. ESMAP's RE support focused on the *upstream work* assisting countries to *become ready for pilot projects or investment projects, to help position countries to access project financing from various facilities*, such as the Clean Technology Fund (CTF), Scaling up Renewable Energy Program (SREP), the Global Environment Facility (GEF), and the Carbon Partnership Facility (CPF).

**Energy and Climate Adaptation** - In 2011, ESMAP expanded its focus on the other dimension of climate change – adaptation. ESMAP's Energy and Climate Adaptation Initiative takes an action research approach to learn by doing, leveraging current knowledge and activities and piloting work in different areas and countries. ESMAP's work on adaptation seeks to develop and test processes to mainstream climate risk management into energy sector planning and operations and to support awareness raising and knowledge transfer. The program's main focus is on knowledge and outreach, by employing a learning-by-doing approach, working with subject matter experts and testing pilot programs such as the World Bank's Global Expert Team for Adaptation and sector specialists.

## 5.2 ESMAP'S CLEAN ENERGY PORTFOLIO (FY2009-11)

ESMAP's FY2009-11 clean energy portfolio comprises of 56 activities<sup>21</sup> implemented by both the World Bank regional departments through the Annual Block Grants (ABGs) and the World Bank's Sustainable Energy Department (SEG). Total grant allocation for activities under the CE portfolio was \$16.2 million with total disbursements of about \$13.7 million<sup>22</sup> (Figure 32).

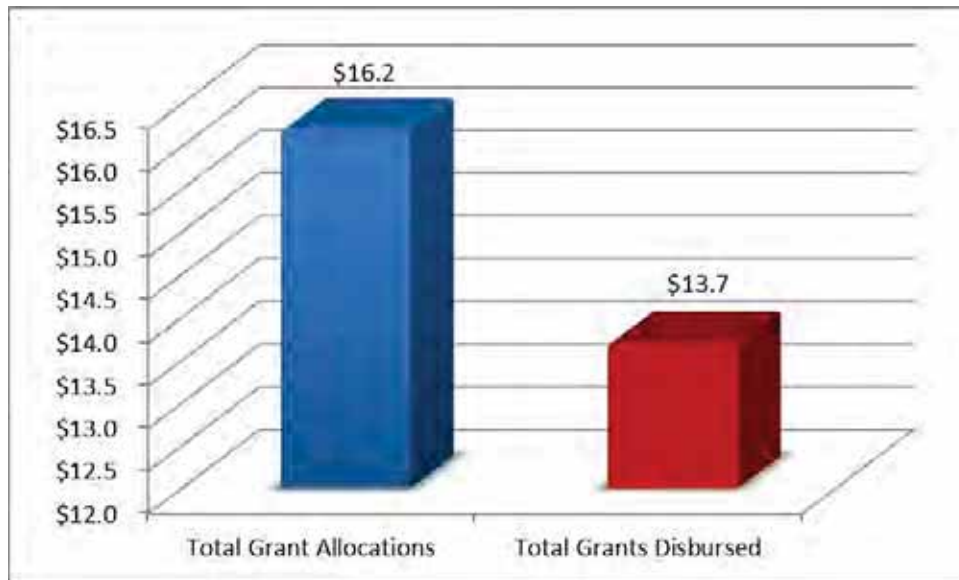
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<sup>21</sup> As of June 30<sup>th</sup>, 2011

<sup>22</sup> As of end of March 2012

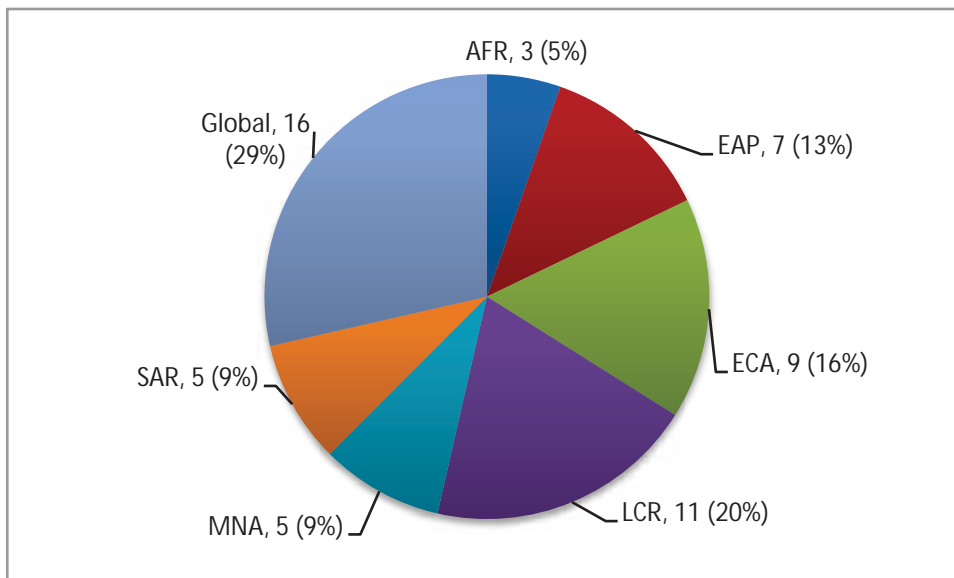


Figure 32 – Clean Energy Portfolio Grant Allocations and Disbursements (as of March 2012) (\$ Million)



There are 56 activities carried out by the Bank’s Energy, Environment and Transport anchors leading with 16 (29%) activities (Global), followed by the Latin American and Caribbean region with 11 (20%), Europe and Central Asia with 9 (16%), East Asia and the Pacific with 7 (13%), South Asia with 5 (9%), Middle East and North Africa with 5 (9%) and the Africa region with 3 (5%). The breakdown of activities by region and implementing unit is shown in Figures 33 and 34. Grant allocation for each of the regions is shown in Figure 35.

Figure 33 - Clean Energy Activities by Region



AFR: Africa, EAP: East Asia and Pacific, ECA: Europe and Central Asia, LCR: Latin America and Caribbean, SAR: South Asia

Figure 34 – Number of ESMAP Clean Energy Activities by Implementing Unit

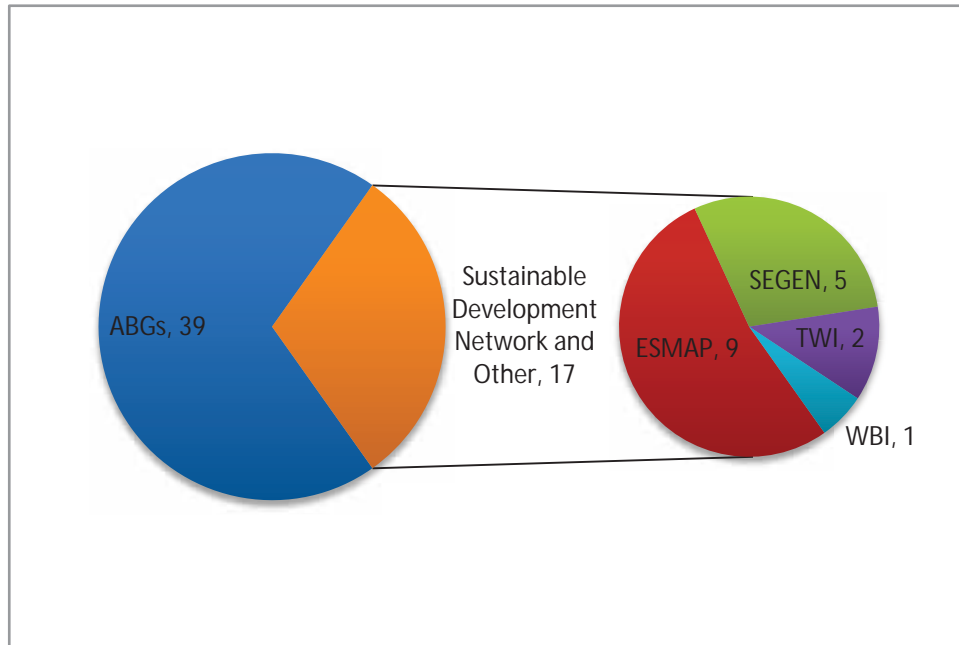
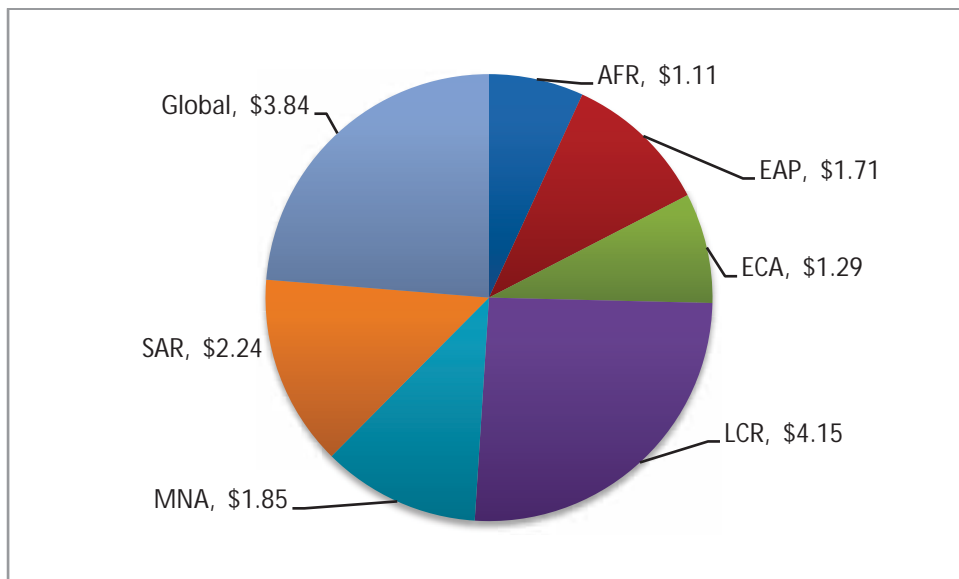


Figure 35 - Grant Allocation by Region under Clean Energy Portfolio (\$ Million)

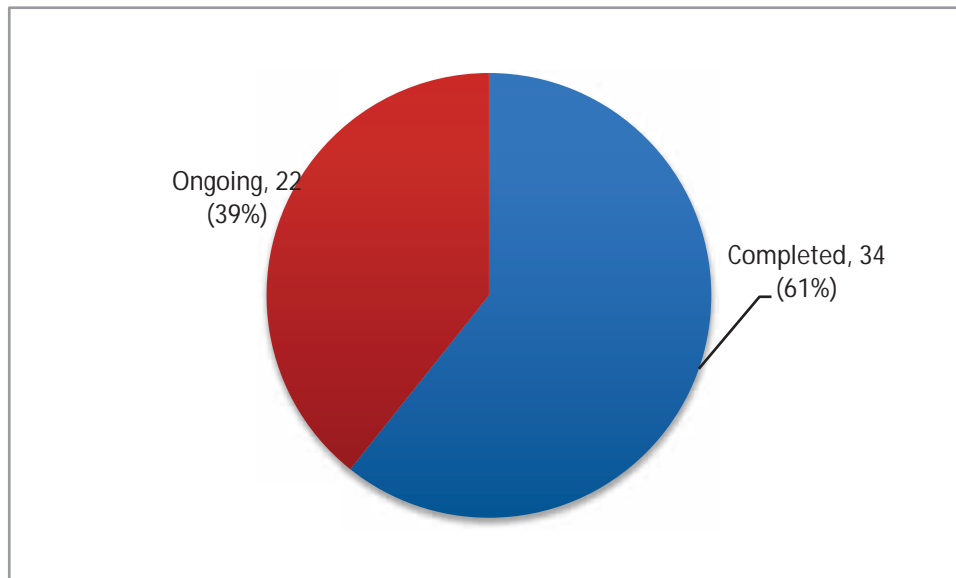


AFR: Africa, EAP: East Asia and Pacific, ECA: Europe and Central Asia, LCR: Latin America and Caribbean, SAR: South Asia

Of the total 56 activities under the clean energy portfolio, 34 (61%) have been completed and delivered to clients and 22 (39%) are still ongoing (Figure 36). Although most ongoing activities have not yet delivered final outputs and therefore it is premature to discern results, some have been included as part of assessment as they documented early noticeable outcomes.



Figure 36 – ESMAP Clean Energy Activities by Status



### 5.3 ASSESSMENT OF OUTCOMES AND RESULTS

The assessment provided evidence that 46 outcomes were achieved under the clean energy portfolio. Results were especially notable under the Policy or Strategy Informed and Development Financing Informed outcomes confirming the important role of ESMAP in catalyzing funds and providing key advisory services in support of sector policies and promoting energy investments in developing countries.

Figure 37 below shows the number and percentage of outcomes observed under the CE portfolio by outcome type. Figure 38 provides a breakdown of number outcome measured by type of indicator. Refer to Annex 1 for details of outcomes achieved under each of the CE activities.

Figure 37 – ESMAP Clean Energy Activities by Outcome Type

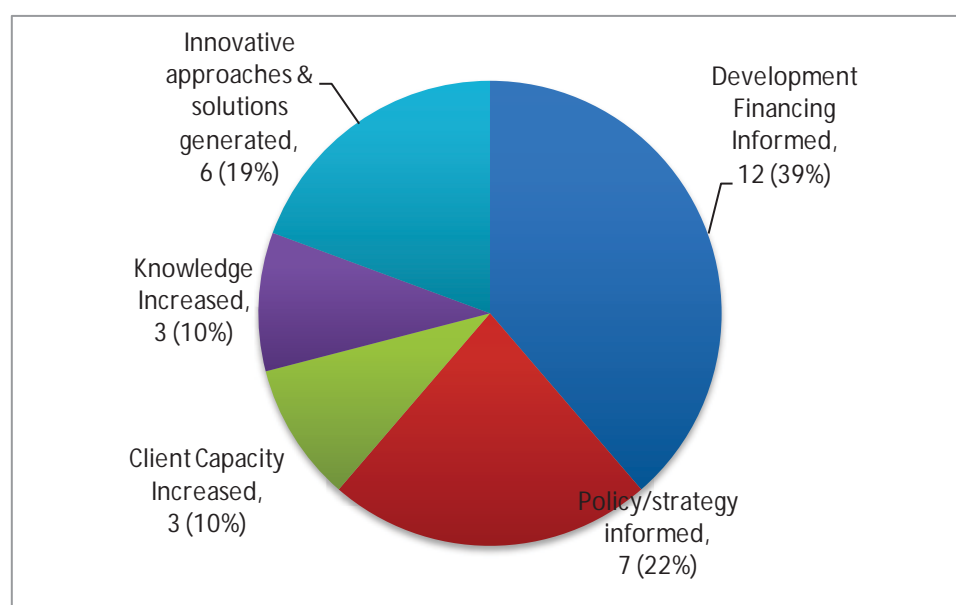


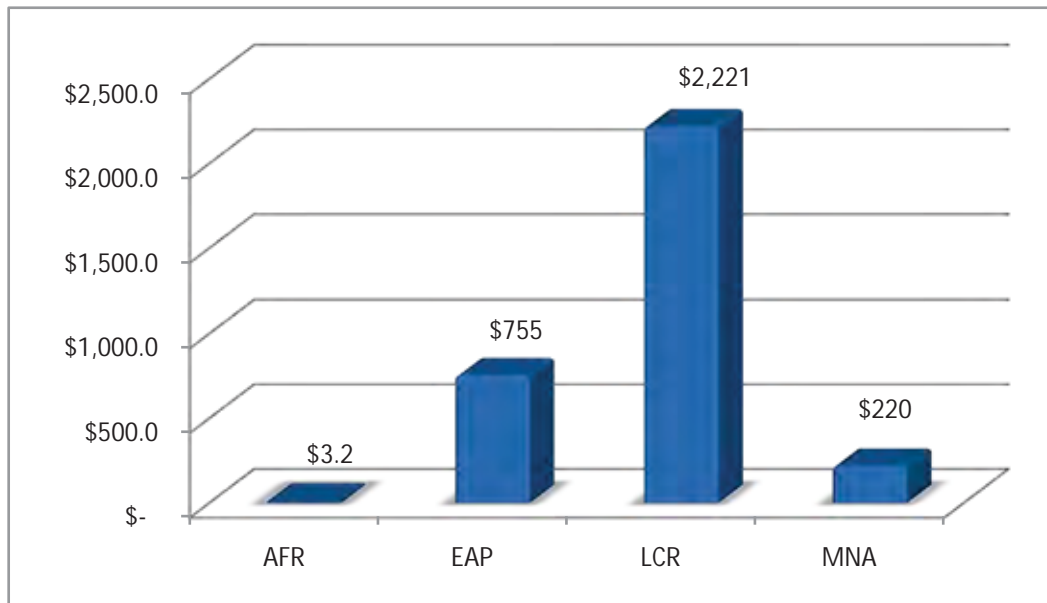
Figure 38 – Number of Outcomes Observed under CE Portfolio by Indicator Type

Outcomes and Indicators	No. of Outcomes Achieved by Indicator Type
<b>1. Development Financing Informed</b>	
1.1 Preparation of new operation informed	10
1.2 Existing operations informed	2
1.3 Mobilization of non-Bank resources informed	0
1.4 Government expenditure informed	0
<i>Subtotal Outcome 1</i>	<i>12</i>
<b>2. Policy/strategy Informed</b>	
2.1 Government policy/strategy informed	13
2.2 Public debate stimulated/initiated	0
2.3 Contributed to stakeholder involvement	0
2.4 Dev't community/partner policy/strategy informed	0
2.5 Bank country strategy (CAS/CPS) informed/influenced	0
2.6 Bank sector strategy informed/influenced	1
<i>Subtotal Outcome 2</i>	<i>14</i>
<b>3. Client Capacity Increased</b>	
3.1 Design capacity strengthened	6
3.2 Implementation capacity strengthened	2
3.3 Monitoring & Evaluation capacity increased	0
3.4 Clients are recognized with good practice or similar awards	0
<i>Subtotal Outcome 3</i>	<i>8</i>
<b>4. Knowledge Increased</b>	
4.1 Facilitated exchange of best practice with clients	5
4.2 Facilitated exchange of best practice with partners	3
4.3 Disseminated best practices	2
<i>Subtotal Outcome 4</i>	<i>10</i>
<b>5. Innovative approaches &amp; solutions generated</b>	
5.1 New innovative approach fostered	0
5.2 New innovative approach developed	2
5.3 Client is able to adopt/harness new technologies, innovative ideas, know-how.	0
<i>Subtotal Outcome 5</i>	<i>2</i>

**Outcome 1 - Development Financing Informed:** A total of 12 outcomes provided evidence of influencing and helping to mobilize, directly or indirectly, about \$3.2 billion<sup>23</sup> in financing from the World Bank Group. Influenced lending was highest in the Latin America region with about \$2.2 billion, followed by the East Asia and Pacific Region with \$755 million (Figure 39). What is critical to note in these numbers is the clear role that ESMAP studies and activities can play in the preparation of new operations, and moreover that ESMAP support can contribute towards the mobilization of new and alternative financing tools such as the Clean Technology Fund and the GEF.

<sup>23</sup> This amount excludes World Bank loans currently in pipeline and loans influenced by ESMAP activities but already approved during fiscal year 2012.

Figure 39 - Amount of World Bank Group Lending Influenced by ESMAP FY09-11 CE Activities (\$ Million)



ESMAP's influence on energy investments for clean energy was notable in the following countries, with greater detail of all activities and outcomes found in the tables below:

- *China: Urban Transport Climate Change Study.* ESMAP supported policy and analytical advice to the Chinese government on successfully guiding urban transport onto a low-carbon path. The rail study has resulted in a new lending project (Kunming Urban Rail Project (P117656, May 2011) for IBRD USD300 million) and the Guangzhou truck pilot resulted in the Guangzhou Truck Technology (P119654, April 2011) for GEF USD 5 million which were both approved in 2011.
- *Mexico: Low Carbon Development Study.* The ESMAP study contributed to the \$1.4 billion Green Growth Development Policy Loan (DPL) of October 2009 informed the Investment Plan for the CTF program in Mexico in the areas of clean energy and sustainable transport, and was the basis of the \$400 million Low-Carbon DPL in November 2010 (FY11) that supported policies and regulations for energy efficiency, renewable energy, urban housing, efficient vehicles, and community forestry. The study also contributed to the design of activities under the CTF and GEF grant for energy efficiency.
- *Middle East and North Africa: Regional Solar Power Initiative.* This activity has supported extensive consultations and capacity building activities in Algeria, Egypt, Jordan, Morocco, and Tunisia, which helped the countries in the region leverage resources for the feasibility and investment phases of CSP projects.

**Outcome 2 – Policy/Strategy Informed:** ESMAP's RE activities have influenced government policies and regulations in countries such as Bulgaria, China, the Philippines, Peru, Colombia, and Mexico as the tables below detail. 14 outcomes provided evidence that Clean Energy activities influenced World Bank and government strategies and policies.

**Outcome 3 – Client Capacity Increased:** ESMAP activities have supported countries to improve their capacity to scale up deployment of RE technologies and engage in mitigation and adaptation planning, design and analysis through workshops, conferences, publications, and web-based tools and learning. Eight outcomes were observed on Clean Energy activities that contributed to strengthening the capacities of client agencies to design, implement, and monitor programs and projects.

**Outcome 4 – Knowledge Increased:** Clean Energy is a relatively new topic, especially with regard to the development agenda and therefore as a starting point to introducing renewable energy and climate change options, knowledge and awareness become a critical entry point to engage with clients and

partners. Given this, the review has noted 10 observed outcomes as evidence that ESMAP's Clean Energy activities have led to increased knowledge with clients and development partners through various means of knowledge exchange, such as workshops, dialogues, writing and disseminating reports.

**Outcome 5 – Innovative Approaches & Solutions Generated:** *Innovative solutions have been developed through online tools:* The MACTool (Marginal Abatement Cost Tool), which builds upon the prototype utilized in the Brazil and Mexico Low Carbon Country Case studies, was developed to bring to the public domain an easy and transparent way to build Marginal Abatement Cost (MAC) curves and to compare low-carbon options at a local and country level. The Brazilian government is currently using MACTool to develop their local cap and trade program. Several Bank teams developing new low-carbon scenarios -- in Colombia, Uruguay, Vietnam, and Macedonia -- have expressed interest in using MACTool as well. In India, the Bank collaborated with the Government of India through its Planning Commission and other sector specialists to develop a low carbon development model, EFFECT (Energy Forecast Framework and Emission Consensus Tool) which is an open tool for forecasting green house gas emissions from low carbon development scenarios. Since then, EFFECT has been implemented in 11 countries and 9 different cities. In Poland, it catalyzed the work on renewable energy and energy efficiency. In Georgia, it has been used to develop a green transportation strategy as championed by the Ministry of Economy and Sustainable Development in order to reduce fuel imports. In Nigeria, the Energy Commission created an EFFECT modeling group within its Energy Planning and Analysis group in order to investigate generation options for a thirty-year time horizon.

## 5.4 HIGHLIGHTED PROJECTS



**ESMAP ACTIVITY: RENEWABLE ENERGY ASSISTANCE PROGRAM**  
**COUNTRY / REGION: MEXICO / LATIN AMERICA AND CARIBBEAN**

This ongoing multi-year ESMAP activity is helping the Government promote and develop renewable energy and design policies and regulations needed to implement its new Renewable Energy Law. It provides the Government of Mexico with technical assistance, just-in time advice, and facilitates knowledge exchange with countries that have successfully introduced renewable energy in their generation mix.

Two studies conducted during the course of this TA have proposed new methodologies to Mexican Secretariat of Energy (SENER) and the Energy Regulatory Commission (CRE). One study analyzes options for the selection of renewable energy projects and alternatives for renewable energy; it proposed a contractual framework to CRE, including standard long-term contracts for renewable energy projects. CRE has expressed readiness to use this for renewable energy and cogeneration auctions in Mexico. The second study -- on economic evaluation of renewable energy to determine targets for renewable energy in the generation mix -- has helped develop a methodology to evaluate RE targets and user guides for its application. Training on the use of the associated modeling software was conducted for staff of SENER - 4 Directors, 3 Sub-directors, and 2 Department Chiefs, who will be responsible for the application of the methodology to calculate the renewable energy targets.

In addition, the ESMAP activities have helped inform the preparation of Mexico's recent Low-Carbon Development Policy Loan (USD 401 million) from IBRD approved in November 2010. The project includes a renewable energy supply component. ESMAP's TA is supporting the policy area of cogeneration and small-scale renewable energy and is helping SENER/CRE/CFE with medium-term actions for this policy area.



**ESMAP Activity: NORTH AFRICA REGIONAL CSP SCALE-UP INITIATIVE**  
**COUNTRY / REGION: REGIONAL / MIDDLE EAST AND NORTH AFRICA**

In partnership with other donors, ESMAP has contributed to efforts to scale up the deployment of concentrating solar power (CSP) technology through TA to five countries of the MENA region. The TA has focused on upstream analysis, master plan preparation, and institutional capacity building. The MENA CSP program is now supported by CTF and has strong synergy with other initiatives that seek to develop the renewable energy potential of the Mediterranean.

Following a regional-level assessment of policy and technical issues related to utilization of the CSP potential in the region, ESMAP financing has enabled extensive consultations and capacity building activities in Algeria, Egypt, Jordan, Morocco, and Tunisia. The following activities have been initiated: (i) assessment of the global technology status including the thermal storage and desalination issues; (ii) economic analyses and site selection methodology; (iii) studies on local manufacturing opportunities; (iv) assessment of transmission capacity requirements; and (v) dispatch optimization assessment for integration of CSP.

By undertaking these activities, ESMAP helped the countries leverage the resources for the feasibility and investment phases of CSP projects – including those of the Multilateral Development Banks, Climate Investment Funds, Carbon Finance, GEF, the EU, bilateral donors, and the private sector. Two WBG-financed projects from the CTF Investment Plan, Ouarzazate in Morocco and Kom Ombo in Egypt, are in advanced stages of preparation. In addition, a 3-10 MW CSP project in the West Bank is in the Bank's portfolio following the ESMAP-funded assessment work undertaken in 2010. The mobilization of funds is underway for this project.

# ANNEX 1 | RESULTS AND OUTCOMES OBSERVED UNDER ESMAP ACTIVITIES BY THEME

## 1. ENERGY ASSESSMENTS AND STRATEGY PROGRAMS

### Africa Region

<b>ESMAP Activity:</b> SUB-SAHARAN AFRICA (SSA) REFINERY STUDY (P110294) <b>Fiscal Year:</b> 2009 <b>Country:</b> REGIONAL	
<b>Outcome:</b> POLICY/STRATEGY INFORMED	<b>Indicator:</b> CONTRIBUTED TO STAKEHOLDER INVOLVEMENT
<p>The ESMAP SSA refinery study helped produce coherent projections of petroleum products consumption for all SSA countries, determined the costs of incremental air pollution in SSA cities, and established the relationship between health benefits and fuel/vehicles regulatory policies. The Africa Refiners Association (ARA), at its annual meeting, endorsed the study results and is committed to pursue actions to obtain the required financing for the economically proven projects and to press governments to upgrade fuel specifications.</p>	

<b>ESMAP Activity:</b> INDICATIVE GENERATION & TRANSMISSION EXPANSION (P099315) <b>Fiscal Year:</b> 2010 <b>Country:</b> SOUTHERN AFRICA																	
<b>Outcome:</b> DEVELOPMENT FINANCING INFORMED	<b>Indicator:</b> PREPARATION OF EXISTING OPERATIONS INFORMED																
<p>This ESMAP study has helped prepare a least cost expansion plan for generation and transmission infrastructure</p> <table border="1"> <thead> <tr> <th><i>WB Lending Operation Informed</i></th> <th><i>Project ID</i></th> <th><i>Approval FY</i></th> <th><i>Amount (US\$)</i></th> </tr> </thead> <tbody> <tr> <td><i>Southern African Power Market Project -APL1</i></td> <td><i>P105654</i></td> <td><i>2009</i></td> <td><i>\$180M WB loan</i></td> </tr> <tr> <td><i>Regional and Domestic Power Market Development Project</i></td> <td><i>P097201</i></td> <td><i>2007</i></td> <td><i>\$196M WB loan</i></td> </tr> <tr> <td><i>Mozambique - Malawi Transmission Interconnection Project - APL2</i></td> <td><i>P084404</i></td> <td><i>2008</i></td> <td><i>\$45M WB loan</i></td> </tr> </tbody> </table> <p>associated with SAPP. The World Bank has funded several investments associated with SAPP.</p>		<i>WB Lending Operation Informed</i>	<i>Project ID</i>	<i>Approval FY</i>	<i>Amount (US\$)</i>	<i>Southern African Power Market Project -APL1</i>	<i>P105654</i>	<i>2009</i>	<i>\$180M WB loan</i>	<i>Regional and Domestic Power Market Development Project</i>	<i>P097201</i>	<i>2007</i>	<i>\$196M WB loan</i>	<i>Mozambique - Malawi Transmission Interconnection Project - APL2</i>	<i>P084404</i>	<i>2008</i>	<i>\$45M WB loan</i>
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<i>Mozambique - Malawi Transmission Interconnection Project - APL2</i>	<i>P084404</i>	<i>2008</i>	<i>\$45M WB loan</i>														

<b>ESMAP Activity:</b> WAPP Broadband Program Assessment (P114643) <b>Fiscal Year:</b> 2010 <b>Country:</b> Regional	
<b>Outcome:</b> Policy/strategy informed	<b>Indicator:</b> Government policy/strategy informed
<p>This activity has provided input for the preparation of the West Africa Regional Communications Program which leverages existing infrastructure such as transmission lines to improve connectivity in the region.</p>	

<b>ESMAP Activity:</b> Energy Sector Master Plan (P107067) <b>Fiscal Year:</b> 2010 <b>Country:</b> Djibouti	
<b>Outcome:</b> Policy/strategy informed	<b>Indicator:</b> Government policy/strategy informed
<p>As recommended by ESMAP's Energy Sector Master Plan activity, the government improved electricity billing and metering systems and has started to charge industrial customers for reactive power since July 2009.</p>	

<b>ESMAP Activity:</b> REGULATING ELECTRICITY TRADING IN SADC (P111483) <b>FISCAL YEAR:</b> 2010 <b>COUNTRY:</b> REGIONAL	
<b>OUTCOME:</b> CLIENT CAPACITY INCREASED	<b>INDICATOR:</b> DESIGN CAPACITY STRENGTHENED
ESMAP's activity helped prepare guidelines for national regulators and regional and national political authorities in Southern African Development Community aimed at promoting efficient, large-scale power transactions of firms. These guidelines were formally adopted by the Regional Electricity Regulatory Association (RERA) of Southern Africa.	

<b>ESMAP Activity:</b> INSTITUTIONAL FRAMEWORK DEVELOPMENT AND CAPACITY BUILDING (P109447) <b>FISCAL YEAR:</b> 2011 <b>COUNTRY:</b> REGIONAL	
<b>OUTCOME:</b> CLIENT CAPACITY INCREASED	<b>INDICATOR:</b> IMPLEMENTATION CAPACITY STRENGTHENED
The activity ensured progress in identifying and defining of the West Africa Power Pool (WAPP) Cote d' Ivoire, Liberia, Sierra Leone and Guinea (CLSG) transmission interconnection project. The activity also helped define key institutional features of the Special purpose Company (SPC), which will be responsible for the WAPP CSLG transmission Interconnector.	

### East Asia and Pacific Region

<b>ESMAP Activity:</b> GENERATION, PRICING, TRADING AND DISPATCH (P106041) <b>FISCAL YEAR:</b> 2009 <b>COUNTRY:</b> CHINA	
<b>OUTCOME:</b> INNOVATIVE APPROACHES & SOLUTIONS GENERATED	<b>INDICATOR:</b> NEW INNOVATIVE APPROACHED DEVELOPED
ESMAP Generation Pricing, Trading and Dispatch activity helped undertake a pilot in Shangdong province in China using modern optimal dispatch software to demonstrate cost savings that would result from a change to least cost dispatching of the power plants. As part of the activity, new financial incentive mechanisms were designed to share the benefits and ensure that no parties are worse off, with the aim to create a win-win outcome. With the intention of mainstreaming it, the government has extended the pilot to five more provinces.	

<b>ESMAP Activity:</b> <ul style="list-style-type: none"> <li>▪ GAS SECTOR DEVELOPMENT FRAMEWORK (P111444)</li> <li>▪ Gas Master Plan (P082155)</li> </ul> <b>FISCAL YEAR:</b> 2009 <b>COUNTRY:</b> VIETNAM			
<b>OUTCOME:</b> DEVELOPMENT FINANCING INFORMED	<b>INDICATOR:</b> PREPARATION OF NEW OPERATIONS INFORMED		
<b>OUTCOME:</b> POLICY/STRATEGY INFORMED	<b>INDICATOR:</b> GOVERNMENT POLICY/STRATEGY INFORMED		
ESMAP supported the preparation of the Gas Master Plan for Vietnam through a series of activities (Gas Sector Development Framework, Gas Master Plan). Approval of a Gas Master Plan by the government is one of the triggers for this loan.			
<i>WB Lending Operation Informed</i>	<i>Project ID</i>	<i>Approval FY</i>	<i>Amount (US\$)</i>
<i>Poverty Reduction Strategy Credit 9 for Vietnam</i>	<i>P111182</i>	<i>2010</i>	<i>\$150M WB loan</i>
<i>Poverty Reduction Strategy Credit 10 for Vietnam</i>	<i>P111183</i>	<i>2012</i>	<i>\$150M WB loan</i>



<b>ESMAP Activity:</b> VIETNAM FINANCIAL IMPACT ASSESSMENT 2 (P119344)	
<b>FISCAL YEAR:</b> 2010	
<b>COUNTRY:</b> VIETNAM	
<b>OUTCOME:</b> CLIENT CAPACITY INCREASED	<b>INDICATOR:</b> IMPLEMENTATION CAPACITY STRENGTHENED
<p>The activity helped prepare and provided hands on training on a transmission financial model and database for Vietnam's Transmission Company (NPT). The practical results and numbers from the assessment and sensitivity analysis from the application of the model were discussed with the regulator, EVN and NPT, creating awareness on impact of different factors (e.g. foreign currency exposure, tariff regulations, etc) on Transmission Plans. This facilitated agreement on the action plan and completion and approval of the transmission regulations.</p>	

<b>ESMAP Activity:</b> GREATER MEKONG SUB-REGION POWER TRADE: POLICY SUPPORT (P114377)	
<b>FISCAL YEAR:</b> 2009	
<b>COUNTRY:</b> MEKONG SUB-REGION	
<b>OUTCOME:</b> CLIENT CAPACITY INCREASED	<b>INDICATOR:</b> DESIGN CAPACITY STRENGTHENED
<p>The ESMAP activity has prepared a report describing and comparing international experience, drawing conclusions and lessons relevant to power trade in the Greater Mekong Sub region (GMS) and the countries involved. The study is being used by participating countries to support actions aimed at taking GMS power trade market to the next phase, in particular by informing institutional structures and implementation strategy for advancing power trade in the region.</p>	

<b>ESMAP Activity:</b> IMPACT OF CREDIT CRISIS ON ENERGY SECTOR (P115088)									
<b>FISCAL YEAR:</b> 2010									
<b>COUNTRY:</b> REGIONAL									
<b>OUTCOME:</b> DEVELOPMENT FINANCING INFORMED	<b>INDICATOR:</b> PREPARATION OF NEW OPERATIONS INFORMED								
<p>This loan is a direct result of a series of assessments undertaken by ESMAP in Vietnam to assess the impacts of the financial crisis on the power sector. These assessments identified the investment gaps in transmission and distribution sector, which is being covered by this loan.</p>									
<table border="1"> <thead> <tr> <th><i>WB Lending Operation Informed</i></th> <th><i>Project ID</i></th> <th><i>Approval FY</i></th> <th><i>Amount (US\$)</i></th> </tr> </thead> <tbody> <tr> <td><i>Vietnam Transmission &amp; Distribution 2-Add Fin</i></td> <td><i>P114875</i></td> <td><i>2011</i></td> <td><i>\$180M WB loan</i></td> </tr> </tbody> </table>		<i>WB Lending Operation Informed</i>	<i>Project ID</i>	<i>Approval FY</i>	<i>Amount (US\$)</i>	<i>Vietnam Transmission &amp; Distribution 2-Add Fin</i>	<i>P114875</i>	<i>2011</i>	<i>\$180M WB loan</i>
<i>WB Lending Operation Informed</i>	<i>Project ID</i>	<i>Approval FY</i>	<i>Amount (US\$)</i>						
<i>Vietnam Transmission &amp; Distribution 2-Add Fin</i>	<i>P114875</i>	<i>2011</i>	<i>\$180M WB loan</i>						

<b>ESMAP Activity:</b> REGIONAL ENERGY STUDY (P103315)	
<b>FISCAL YEAR:</b> 2010	
<b>COUNTRY:</b> REGIONAL	
<b>OUTCOME:</b> POLICY/STRATEGY INFORMED	<b>INDICATOR:</b> BANK SECTOR STRATEGY INFORMED/INFLUENCED
<p>The ESMAP study outlines a strategic vision of a sustainable energy future in East Asia, and presents a menu of options is serving as World Bank's energy strategy for the region. The recommendations of the study were endorsed by the regional management and study is serving as the EAP regional energy business strategy.</p>	



## Europe and Central Asia Region

<b>ESMAP ACTIVITY: ELECTRICITY SUPPLY RELIABILITY (P116748)</b>			
FISCAL YEAR: 2010			
COUNTRY: ARMENIA			
<b>OUTCOME: DEVELOPMENT FINANCING INFORMED</b>		<b>INDICATOR: EXISTING OPERATIONS INFORMED</b>	
<p>The ESMAP activity supported the design of a cost-reflective tariff system in Armenia, which was incorporate into a lending operation. In doing so, the activity will help generate more resources for the power sector and improve the</p>			
<i>WB Lending Operation Informed</i>	<i>Project ID</i>	<i>Approval FY</i>	<i>Amount (US\$)</i>
<i>Electricity Supply Reliability Project</i>	<i>P116748</i>	<i>2011</i>	<i>\$39 M WB loan</i>
reliability of the power system in Armenia.			

<b>ESMAP ACTIVITY: SMART METERING (P110874)</b>	
FISCAL YEAR: 2009	
COUNTRY: HUNGARY	
<b>OUTCOME: POLICY/STRATEGY INFORMED</b>	<b>INDICATOR: GOVERNMENT POLICY/STRATEGY INFORMED</b>
<p>The study provided a foundation for the Government of Hungary to formulate its smart metering policy by taking into accounts both international best practice and local conditions. The feedback received from Hungarian Energy Office (HEO) (including detailed next steps for smart metering implementation) upon activity completion, confirms that measures suggested by the ESMAP will be adopted.</p>	

<b>ESMAP ACTIVITY:</b>			
<ul style="list-style-type: none"> <li>▪ SUPPORTING ELECTRIC MARKET OPERATIONS (P105103)</li> <li>▪ CAPACITY BUILDING FOR ELECTRICITY MARKETS (P114534)</li> </ul>			
FISCAL YEAR: 2009			
COUNTRY: TURKEY			
<b>OUTCOME: DEVELOPMENT FINANCING INFORMED</b>		<b>INDICATOR: PREPARATION OF NEW OPERATIONS INFORMED</b>	
<b>OUTCOME: CLIENT CAPACITY INCREASED</b>		<b>INDICATOR: IMPLEMENTATION CAPACITY STRENGTHENED</b>	
<b>OUTCOME: INNOVATIVE APPROACHES &amp; SOLUTIONS GENERATED</b>		<b>INDICATOR: NEW INNOVATIVE APPROACHED DEVELOPED</b>	
<p>Through a series of activities, ESMAP supported technical advice and training for the development and implementation of power market reforms. These activities helped introduce supply security legislation and regulations, and provided the basis for government to take supply security measures in a manner consistent with the market framework, including launching of hourly metering and settlement and day ahead electricity market. ESMAP organized training for TEIAS staff working in various departments, which helped improve their knowledge on the operation of capacity mechanisms and capacity auctions. ESMAP also helped establish suitable capacity certificate schemes and competitive auction mechanism. The two measures together are intended to assist in mitigating the risks of supply shortage and to help to ensure that sufficient new capacity is available. These reforms facilitated a scale up of World Bank energy lending to Turkey in recent years.</p>			
<i>WB Lending Operation Informed</i>	<i>Project ID</i>	<i>Approval FY</i>	<i>Amount (US\$)</i>
<i>Programmatic Electricity Sector DPL</i>	<i>P110643</i>	<i>2009</i>	<i>\$720M WB loan</i>
<i>ECSEE APL#6</i>	<i>P110841</i>	<i>2011</i>	<i>\$200M WB loan</i>
<i>Private Sector RE and EE Project</i>	<i>P112578</i>	<i>2009</i>	<i>\$500M WB loan</i>
<i>ESES DPL2</i>	<i>P117651</i>	<i>2010</i>	<i>\$350M WB loan</i>

<b>ESMAP ACTIVITY:</b> THERMAL POWER PLANT REHABILITATION (P105332)	
FISCAL YEAR: 2009	
COUNTRY : UKRAINE	
<b>OUTCOME:</b> POLICY/STRATEGY INFORMED	<b>INDICATOR:</b> GOVERNMENT POLICY/STRATEGY INFORMED
<p>The ESMAP study analyzed the barriers affecting implementation of Thermal Power Plants rehabilitation, assessed of the need for rehabilitation of Thermal Power Plants in Ukraine, and recommended steps that the Government should take to formulate a strategy to address the needs of the Thermal Power Plants. This study served as an input in the formulation of government's strategy for addressing the rehabilitation needs of thermal power plants in Ukraine.</p>	

<b>ESMAP ACTIVITY:</b> BELARUS AND UKRAINE DISTRICT HEATING (P112754)			
FISCAL YEAR: 2011			
COUNTRY: UKRAINE			
<b>OUTCOME:</b> DEVELOPMENT FINANCING INFORMED	<b>INDICATOR:</b> EXISTING OPERATIONS INFORMED		
<p>This ESMAP activity is conducting an in-depth analysis of the binding constraints to municipal creditworthiness for energy efficiency investments and to identify viable financial options, such as the promotion of Energy Service Company (ESCO) models. This assessment directly informed efforts of the <i>Ukraine Energy Efficiency Project</i> to improve energy efficiency in industrial and commercial companies, municipalities, municipal sector enterprises and Energy Service Companies by facilitating sustainable financial intermediation for the financing of energy efficiency investments.</p>			
<i>WB Lending Operation Informed</i>	<i>Project ID</i>	<i>Approval FY</i>	<i>Amount (US\$)</i>
<i>Ukraine Energy Efficiency Project</i>	<i>P096586</i>	<i>2011</i>	<i>\$200M WB loan</i>

<b>ESMAP ACTIVITY:</b> SOUTH EAST EUROPE WHOLESALE MARKET OPENING (P112423)			
FISCAL YEAR: 2009			
COUNTRY: SOUTH EAST EUROPE			
<b>OUTCOME:</b> DEVELOPMENT FINANCING INFORMED	<b>INDICATOR:</b> PREPARATION OF NEW OPERATIONS INFORMED		
<b>OUTCOME:</b> POLICY/STRATEGY INFORMED	<b>INDICATOR:</b> GOVERNMENT POLICY/STRATEGY INFORMED		
<p>The ESMAP activity developed a decentralized regional energy market design, which is to be implemented with national control and regional cooperation. The study recommendations are being used as input for making decisions on future regional market design by governments participating in the market. The Bank has approved a \$1 billion Adaptable Program Loan for undertaking investments associated with energy markets in the region.</p>			
<i>WB Lending Operation Informed</i>	<i>Project ID</i>	<i>Approval FY</i>	<i>Amount (US\$)</i>
<i>Energy Community of South East Europe Adaptable Program Loan</i>	<i>NA</i>	<i>2006</i>	<i>\$1000M WB loan</i>

### Latin America and Caribbean Region

<b>ESMAP ACTIVITY:</b> NATURAL GAS STUDY (P111012)	
FISCAL YEAR: 2009	
COUNTRY: PERU	
<b>OUTCOME:</b> POLICY/STRATEGY INFORMED	<b>INDICATOR:</b> GOVERNMENT POLICY/STRATEGY INFORMED
<p>Based on stakeholder consultations, the ESMAP study assessed Peru's natural gas sector and made recommendations on regulatory measures, planning and consumer/sector demand. The government has started to implement policy adjustments supported by the findings of the study.</p>	

<b>ESMAP ACTIVITY: IMPACT OF CREDIT CRISIS ON ENERGY IN LAC (P118014)</b>			
FISCAL YEAR: 2009			
COUNTRY: REGIONAL			
OUTCOME: DEVELOPMENT FINANCING INFORMED		INDICATOR: PREPARATION OF NEW OPERATIONS INFORMED	
<p>The loan was prepared in parallel to the ESMAP activity, <i>Assessing the Impact of Recent Credit Constraints on Energy Sector Investment Requirements in Latin America</i>. Consultations undertaken with the Jamaican government during ESMAP activity helped identify energy investments to be funded through this loan.</p>			
<i>WB Lending Operation Informed</i>	<i>Project ID</i>	<i>Approval FY</i>	<i>Amount (US\$)</i>
<i>JM Energy Investments and TA</i>	<i>P112780</i>	<i>FY11</i>	<i>\$15M WB loan</i>

<b>ESMAP ACTIVITY: PROGRAMMATIC ENERGY STUDY (P110201)</b>	
FISCAL YEAR: 2009	
COUNTRY: REGIONAL	
OUTCOME: POLICY/STRATEGY INFORMED	INDICATOR: BANK SECTOR STRATEGY INFORMED/INFLUENCED
<p>Based on this ESMAP study, a Bank Strategy for Central America Power Sector has been proposed comprising of five thematic pillars: Renewable Energy, Energy Efficiency, Integration, Institutional and Regulatory Strengthening, Energy Access.</p>	

<b>ESMAP ACTIVITY: PROGRAMMATIC APPROACH IN SUPPORT OF THE POWER SECTOR IN CENTRAL AMERICA (P122936)</b>	
FISCAL YEAR: 2011	
COUNTRY: REGIONAL	
OUTCOME: POLICY/STRATEGY INFORMED	INDICATOR: GOVERNMENT POLICY/STRATEGY INFORMED
<p>Based on the work undertaken as part of the ESMAP activity, all ministers from Central American countries signed a declaration to encourage greater development and use of renewable energy and implementation of plans and programs for the efficient and rational use of energy in May 2010.</p>	

### Middle East and North Africa Region

<b>ESMAP ACTIVITY: ENERGY PRICING STRATEGY (P107068)</b>			
FISCAL YEAR: 2009			
COUNTRY: EGYPT			
OUTCOME: DEVELOPMENT FINANCING INFORMED		INDICATOR: PREPARATION OF NEW OPERATIONS INFORMED	
OUTCOME: POLICY/STRATEGY INFORMED		INDICATOR: GOVERNMENT POLICY/STRATEGY INFORMED	
<p>The ESMAP study prepared a plan for reforming energy prices and subsidies within a 5-year timeframe while taking into account the social and economic impact of the reforms. The government has started implementing some of these recommendations to make electricity and natural gas pricing more reflective of the costs. The work undertaken to prepare the pricing strategy helped inform the policy dialogue during the preparation of these two investment projects.</p>			
<i>WB Lending Operation Informed</i>	<i>Project ID</i>	<i>Approval FY</i>	<i>Amount (US\$)</i>
<i>Ain Sokhna Power</i>	<i>P100047</i>	<i>2009</i>	<i>\$600M WB loan</i>
<i>Giza North Power Project</i>	<i>P116194</i>	<i>2010</i>	<i>\$600M WB Loan</i>

<b>ESMAP ACTIVITY: DESIGN OF LOAD MANAGEMENT PROGRAM (P104888)</b>			
FISCAL YEAR: 2009			
COUNTRY: EGYPT			
OUTCOME: DEVELOPMENT FINANCING INFORMED		INDICATOR: PREPARATION OF NEW OPERATIONS INFORMED	
<p>The ESMAP activity helped design a load management program to reduce demand during peak periods, building on the work already undertaken by Egyptian Electricity Holding Company in this area. The Ain Sokhna Power loan helped implement the time of use tariff design designed by the ESMAP Activity.</p>			
<i>WB Lending Operation Informed</i>	<i>Project ID</i>	<i>Approval FY</i>	<i>Amount (US\$)</i>
<i>Ain Sokhna Power</i>	<i>P100047</i>	<i>2009</i>	<i>\$600M WB loan</i>

<b>ESMAP ACTIVITY: ENERGY SUPPLY STRATEGY (P108120)</b>			
FISCAL YEAR: 2010			
COUNTRY: MOROCCO			
OUTCOME: DEVELOPMENT FINANCING INFORMED		INDICATOR: PREPARATION OF NEW OPERATIONS INFORMED	
<p>The ESMAP activity helped investigate how new programs and financial resources including the Clean Technology Fund (CTF), could foster a greater development of low carbon options to support Morocco's energy supply strategy (2025-2030). The study identified CSP as one of the low carbon options to be proposed for funding by the CTF, setting the stage for the preparation of this loan.</p>			
<i>WB Lending Operation Informed</i>	<i>Project ID</i>	<i>Approval FY</i>	<i>Amount (US\$)</i>
<i>Morocco Ouarzazate Concentrated Solar Power</i>	<i>P122028</i>	<i>2012</i>	<i>\$297 M WB loan</i>

<b>ESMAP ACTIVITY: STRUCTURING NEW ENERGY AGENCY (P104087)</b>			
FISCAL YEAR: 2008			
COUNTRY: MOROCCO			
OUTCOME: DEVELOPMENT FINANCING INFORMED		INDICATOR: PREPARATION OF EXISTING OPERATIONS INFORMED	
OUTCOME: POLICY/STRATEGY INFORMED		INDICATOR: GOVERNMENT POLICY/STRATEGY INFORMED	
<p>On the basis of the recommendations made under this activity, the Government of Morocco was able to transform the <i>Centre de Recherches sur les Energies Renouvelables</i> (CDER) into an energy agency that would better serve the needs of Morocco vis-a-vis the development of Renewable Energy (RE) and progress towards Energy Efficiency (EE). Approval of a law for setting up new energy agency is a tranche release condition for the loan.</p>			
<i>WB Lending Operation Informed</i>	<i>Project ID</i>	<i>Approval FY</i>	<i>Amount (US\$)</i>
<i>Morocco-Energy Sector DPL</i>	<i>P099618</i>	<i>2007</i>	<i>\$100M WB loan</i>

<b>ESMAP ACTIVITY: ELECTRICITY SECTOR STRATEGY (P110581)</b>			
FISCAL YEAR: 2009			
COUNTRY: SYRIA			
OUTCOME: POLICY/STRATEGY INFORMED		INDICATOR: GOVERNMENT POLICY/STRATEGY INFORMED	
<p>The new electricity law approved by the government has been influenced by the sector strategy note prepared under this ESMAP activity. As suggested by the ESMAP study, the new law prioritizes renewable energy and energy efficiency and encourages private investment in the sector.</p>			

<b>ESMAP ACTIVITY: REVIEW OF ENERGY MANAGEMENT POLICY (P104800)</b>			
FISCAL YEAR: 2009			
COUNTRY: TUNISIA			
OUTCOME: DEVELOPMENT FINANCING INFORMED		INDICATOR: PREPARATION OF NEW OPERATIONS INFORMED	
<p>The activity provided advice to the government on limiting the country's vulnerability to international energy markets, and reducing the burden on the country's finance due to higher oil prices. The Bank loan noted below implemented one of the suggested financing mechanisms recommended by the ESMAP study.</p>			
<i>WB Lending Operation Informed</i>	<i>Project ID</i>	<i>Approval FY</i>	<i>Amount (US\$)</i>
<i>Tunisia Energy Efficiency and Renewable Energy Investment Project</i>	<i>P104266</i>	<i>2009</i>	<i>\$55M WB loan</i>

<b>ESMAP ACTIVITY: MAGHREB ENERGY MARKET STUDY (P106446)</b>			
FISCAL YEAR: 2009			
COUNTRY: REGIONAL			
OUTCOME: DEVELOPMENT FINANCING INFORMED		INDICATOR: PREPARATION OF NEW OPERATIONS INFORMED	
OUTCOME: POLICY/STRATEGY INFORMED		INDICATOR: BANK SECTOR STRATEGY INFORMED/INFLUENCED	
<p>The activity helped facilitate the development of a Maghreb energy market, by leveraging the Bank experience in the development of regional energy markets, through the organization of a workshop and preparation of reports. This study helped prepare the World Bank's work program for regional integration of energy markets in Middle East and North Africa. Workshops undertaken under this activity helped facilitate discussions and forge consensus on CSP development options.</p>			
<i>WB Lending Operation Informed</i>	<i>Project ID</i>	<i>Approval FY</i>	<i>Amount (US\$)</i>
<i>Tunisia -Concentrated Solar Power</i>	<i>P122029</i>	<i>2013 (in pipeline)</i>	<i>\$35 M WB loan</i>

<b>ESMAP ACTIVITY: ASSESSING ENERGY SECTOR CREDIT CONSTRAINTS (P116206)</b>			
FISCAL YEAR: 2010			
COUNTRY: REGIONAL			
OUTCOME: DEVELOPMENT FINANCING INFORMED		INDICATOR: PREPARATION OF NEW OPERATIONS INFORMED	
<p>This loan was identified based on the assessment carried out by ESMAP to estimate the impact of the financial crisis in Egypt and Jordan and to identify investment shortfalls in the power sector. This project was flagged by the Egyptian government as requiring priority financing from the World Bank. Two additional loans, also influenced by ESMAP are currently being proposed: <i>Egypt Dairut Independent Power Project</i> and <i>Jordan Fujeij Wind IPP</i>.</p>			
<i>WB Lending Operation Informed</i>	<i>Project ID</i>	<i>Approval FY</i>	<i>Amount (US\$)</i>
<i>Egypt - Helwan South Power Project</i>	<i>P117407</i>	<i>2011</i>	<i>\$385M WB loan</i>

## South Asia Region

<b>ESMAP ACTIVITY: SUPPORT TO STRATEGIC ENERGY SECTOR DEVELOPMENT (P122960)</b>			
FISCAL YEAR: 2011			
COUNTRY: NEPAL			
<b>OUTCOME: DEVELOPMENT FINANCING INFORMED</b>		<b>INDICATOR: PREPARATION OF NEW OPERATIONS INFORMED</b>	
<p>The ESMAP activity helped raise awareness of complex energy sector issues and achieve a greater appreciation of energy sector development issues and priorities among sector decision-makers and specialists as well as the public at large. The Kabeli Transmission Project benefited from these efforts by ensuring greater buy in from stakeholders for the project.</p>			
<i>WB Lending Operation Informed</i>	<i>Project ID</i>	<i>Approval FY</i>	<i>Amount (US\$)</i>
<i>Kabeli Transmission Project</i>	<i>P112893</i>	<i>2011</i>	<i>\$38M WB loan</i>

<b>ESMAP ACTIVITY: ORGANIZATIONAL TRANSFORMATION AND PUBLIC PRIVATE PARTNERSHIPS IN MSETCL (P111243)</b>			
FISCAL YEAR: 2009			
COUNTRY: INDIA			
<b>OUTCOME: DEVELOPMENT FINANCING INFORMED</b>		<b>INDICATOR: PREPARATION OF NEW OPERATIONS INFORMED</b>	
<b>OUTCOME: CLIENT CAPACITY INCREASED</b>		<b>INDICATOR: IMPLEMENTATION CAPACITY STRENGTHENED</b>	
<p>The ESMAP activity helped improve the institutional capacity in Maharashtra State Electricity Transmission Corporation Limited to effectively implement its proposed investment plan to bridge high demand-supply gap in power in the state of Maharashtra, effectively maintain assets and enhance competition (through transmission open access) in the state. Under the activity, several meetings, workshops and field visits were conducted for dissemination of proposed changes and to obtain feedback the changes, which resulted in better design and implementation. The activity has helped facilitate fast-track transmission infrastructure development and improved business processes/organizational structures of the MSETCL. The ESMAP activity served as a springboard for IFC's loan to MSETCL.</p>			
<i>WB Lending Operation Informed</i>	<i>Project ID</i>	<i>Approval FY</i>	<i>Amount (US\$)</i>
<i>IFC Loan for MSETCL</i>	<i>NA</i>	<i>2009</i>	<i>\$200M IFC loan</i>

<b>ESMAP ACTIVITY:</b>			
<ul style="list-style-type: none"> <li>▪ BEST PRACTICE IN ENERGY EFFICIENCY IMPROVEMENT IN COAL FIRED GENERATION (P105191)</li> <li>▪ REGULATORY AND PLANNING REQUIREMENT FOR REHABILITATION OF COAL FIRED GENERATION (P105194)</li> </ul>			
FISCAL YEAR: 2009			
COUNTRY: INDIA			
<b>OUTCOME: DEVELOPMENT FINANCING INFORMED</b>		<b>INDICATOR: PREPARATION OF NEW OPERATIONS INFORMED</b>	
<b>OUTCOME: POLICY/STRATEGY INFORMED</b>		<b>INDICATOR: GOVERNMENT POLICY/STRATEGY INFORMED</b>	
<b>OUTCOME: CLIENT CAPACITY INCREASED</b>		<b>INDICATOR: IMPLEMENTATION CAPACITY STRENGTHENED</b>	

These two activities provided inputs for the preparation of a government action plan for rehabilitation of thermal power plants. Regulatory commissions expect that state utilities/project sponsors will request that one or a combination of the options developed under the ESMAP study are assessed for use when they make application for investment and tariff approval for future rehabilitation investment. These activities have also assisted in transferring international best practices in this area to India through a study and through experts' site visits and seminars & workshops. The ESMAP study has also helped identify the regulatory and planning requirements for rehabilitation of coal-fired generation plants and shared it with the Forum of Regulators.

By helping demonstrate mechanisms for adopting energy efficient rehabilitation and operating/maintenance practices at coal-fired generation units in India, these activities facilitated the preparation of two World Bank loans for the rehabilitation of coal-fired plants in India.

<i>WB Lending Operation Informed</i>	<i>Project ID</i>	<i>Approval FY</i>	<i>Amount (US\$)</i>
<i>Coal-Fired Generation Rehabilitation</i>	<i>P100531</i>	<i>2009</i>	<i>\$180M WB loan</i>
<i>Coal-Fired Generation Rehabilitation II</i>	<i>P100101</i>	<i>2009</i>	<i>\$45.4M WB loan</i>

**ESMAP ACTIVITY: POWER SECTOR STOCKTAKING (P122931)**

FISCAL YEAR: 2011

COUNTRY: INDIA

**OUTCOME: POLICY/STRATEGY INFORMED**

**INDICATOR: GOVERNMENT POLICY/STRATEGY INFORMED**

The background paper on energy access prepared as part of the activity, which provides recommendations on policies for increasing energy access in India, has been used as an input for the preparation of the country's 12th five year plan.

**ESMAP ACTIVITY: ENERGY SECTOR VULNERABILITY ASSESSMENT (P120587)**

FISCAL YEAR: 2011

COUNTRY: REGIONAL

**OUTCOME: POLICY/STRATEGY INFORMED**

**INDICATOR: BANK SECTOR STRATEGY INFORMED/INFLUENCED**

The ESMAP activity provided important insights into the power sector financing situation in Bangladesh, Pakistan, and India. The activity has served to underpin the Bank's country dialogue and sector strategies in these countries, in terms of where they need to focus in terms of moving along the curve of attracting large scale investments from partners, including the private sector.

**ESMAP ACTIVITY: ENVIRONMENTALLY SUSTAINABLE POWER DEVELOPMENT (P111245)**

FISCAL YEAR: 2009

COUNTRY: SRI LANKA

**OUTCOME: CLIENT CAPACITY INCREASED**

**INDICATOR: DESIGN CAPACITY STRENGTHENED**

**OUTCOME: KNOWLEDGE INCREASED**

**INDICATOR: FACILITATED EXCHANGE OF BEST PRACTICE WITH CLIENTS**

The methodology developed in this report was used by the Government of Sri Lanka for preparing long term power sector investment plan of the country. As part of the activity, a stakeholder workshop was conducted in November 2009 and the analytical tools used in this report were presented at a technical workshop for Ceylon Electricity Board (CEB) staff in January 2010. These workshops were opportunities for all stakeholders to provide inputs and comments, as well as a forum for learning.



## Global

<b>ESMAP ACTIVITY: PRIVATE AND PUBLIC SECTOR ROLES (P120423)</b>	
FISCAL YEAR: 2010	
<b>OUTCOME: POLICY/STRATEGY INFORMED</b>	<b>INDICATOR: BANK SECTOR STRATEGY INFORMED/INFLUENCED</b>
The analysis and assessment of the experience and outcomes of different approaches and models of ownership and financing of the power sector undertaken as part of this ESMAP study helped inform preparation of World Bank's Energy Strategy <sup>24</sup> .	

<b>ESMAP ACTIVITY: ELECTRICITY TRANSMISSION PLANNING (P118729)</b>	
FISCAL YEAR: 2010	
<b>OUTCOME: POLICY/STRATEGY INFORMED</b>	<b>INDICATOR: GOVERNMENT POLICY/STRATEGY INFORMED</b>
<b>OUTCOME: KNOWLEDGE INCREASED</b>	<b>INDICATOR: FACILITATED EXCHANGE OF BEST PRACTICE WITH CLIENTS</b>
Under this ESMAP activity, policy principles for efficiently developing transmission for renewable energy developed under the activity were shared with five client countries - Philippines, Mozambique, South Africa, Saudi Arabia, and Morocco - at their request. Recommendations from this activity on transmission systems for renewable energy have been used to operationalize specific transmission regulations in Philippines.	

<b>ESMAP ACTIVITY: NOCs CASE STUDIES (P109169)</b>	
FISCAL YEAR: 2009	
<b>OUTCOME: POLICY/STRATEGY INFORMED</b>	<b>INDICATOR: GOVERNMENT POLICY/STRATEGY INFORMED</b>
The paper prepared as part of this activity was used as input to design the role and organization of a new national oil company for the Government of Uganda.	

<b>ESMAP ACTIVITY: POWER SECTOR MARKET STRUCTURE (P113129)</b>	
FISCAL YEAR: 2009	
<b>OUTCOME: KNOWLEDGE INCREASED</b>	<b>INDICATOR: DISSEMINATED BEST PRACTICES</b>
Policy recommendation and lessons learned on the optimal power market structure were shared with energy practitioners and stakeholders at the World Forum on Energy Regulation; the activity was recognized as a major contribution both in terms of data collection and analysis.	

### EASP Activities with Limited or Unobserved Results

Of the 48 completed activities that were reviewed, the desk assessment could not easily track impacts or specific outcomes for 16 of them. Outputs for some of these activities have recently concluded and disseminated, therefore identifying outcomes is still premature. Details are provided below.

<b>ESMAP ACTIVITY: OIL SUPPLY LOGISTICS AND SECURITY FOR SMALL OIL-IMPORTING AFRICAN COUNTRIES (P099257)</b>	
FISCAL YEAR: 2009	
COUNTRY / REGION: AFRICA	
The activity report provided a quality analysis of the state of the downstream petroleum sectors in Rwanda, Uganda and Kenya, and made useful recommendations to improve oil facilities and supply logistics. However, the delay in completing report compromised the relevance of the report, as oil prices fell and additional oil was discovered in client countries.	

<sup>24</sup> Approval of the World Bank's energy strategy is still pending.



**ESMAP ACTIVITY: SUB SAHARAN AFRICA PETROLEUM EFFICIENCY STUDY (P109700)**

**FISCAL YEAR: 2009**

**COUNTRY / REGION: AFRICA**

A study that provides options for optimizing the existing petroleum products supply policies, including taxation and pricing policies, and the imports and storage infrastructure across a selection of countries in Sub-Saharan Africa has been prepared. However, there is no observable evidence that any of the recommendations of the study have been adopted by governments.

**ESMAP ACTIVITY: PPP OPTIONS FOR ELECTRICITY GENERATION (P112552)**

**FISCAL YEAR: 2010**

**COUNTRY / REGION: MONTENEGRO / EUROPE AND CENTRAL ASIA**

The objective of the activity was to assess the legal, institutional and regulatory framework for private participation in power generation, investigate PPP options for future power generation capacity, and make recommendations to changes on the current framework and on suitable options for PPP in Montenegro. While the activity is now complete, there is no evidence of the Government having used the recommendations of the World Bank study.

**ESMAP ACTIVITY: IMPACT OF FINANCIAL CRISIS ON POWER SECTOR (P118724)**

**FISCAL YEAR: 2011**

**COUNTRY / REGION: EUROPE AND CENTRAL ASIA**

The objective of the activity was to help assess the impact of the financial crisis on the power sector in the Europe and Central Asia region and to identify specific investment and policy measures to respond to the crisis. There is no observable evidence to indicate that the activity informed specific policy or investment actions of either the Government or the World Bank that were taken in response to the crisis.

**ESMAP ACTIVITY: ENERGY ENVIRONMENT AND POPULATION – PHASE II (P113882)**

**FISCAL YEAR: 2010**

**COUNTRY / REGION: LATIN AMERICA AND CARIBBEAN**

The objective of this activity was to increase the understanding between the governments, companies and indigenous peoples in relation to development of the region's hydrocarbon potential in a way compatible with the sustainable development of the Amazon. Since the activity was only recently been completed, it is not clear if the activity has been successful in meeting its objectives.

**ESMAP ACTIVITY: ELECTRICITY PRICING AND POWER SECTOR REFORM (P106901)**

**FISCAL YEAR: 2009**

**COUNTRY / REGION: IRAN / MIDDLE EAST AND NORTH AFRICA**

The main objective of the activity -- to assist Government of Iran in its effort to advance the power sector reform program, especially in the areas of electricity pricing and subsidies, electricity market restructuring and regulation, investment planning, and private sector participation -- has not been fully achieved as the Bank team could not follow up on the final report and its recommendations due to an embargo on Bank mission travel to Iran since June 2009. Thus, the Bank team has no information to what extent the Iranian counterparts implemented the measures suggested in the report, which was shared with the Government of Iran.

**ESMAP ACTIVITY: SUPPORT TO DEVELOP STRATEGY FOR THE GOVERNMENT'S PUBLIC TRANSPORT SUB-SECTOR (P110209)**

**FISCAL YEAR: 2009**

**COUNTRY / REGION: WEST BANK AND GAZA / MIDDLE EAST AND NORTH AFRICA**

There has only been a modest improvement in the capacity of the officials at the Ministry of Transport. Adoption of new government policy based on the study is also unlikely in the near term and will require substantial efforts and more time to achieve. However, there is significant interest in funding the recommendations of the ESMAP study from other development partners such as USAID, GTZ and AFD.

**ESMAP ACTIVITY: MAGHREB VULNERABILITY ASSESSMENT (P116216)**

**FISCAL YEAR: 2010**

**COUNTRY / REGION: MIDDLE EAST AND NORTH AFRICA**

The objective of the activity was to help assess the impact of the financial crisis on the power sector in the Middle East and North Africa region and to identify specific investment and policy measures to respond to the crisis. There is no observable evidence to indicate that the activity informed specific policy or investment actions of either the Government or the World Bank that were taken in response to the crisis.

**ESMAP ACTIVITY: ENERGY INTEGRATION STUDY (P113903)**

**FISCAL YEAR: 2009**

**COUNTRY / REGION: MIDDLE EAST AND NORTH AFRICA**

The objective of this study was to carry out a country-by-country assessment of the power and gas sectors in order to inform efforts to enhance regional energy integration in the Mashreq and neighboring countries. While a comprehensive report on the potential of regional energy (gas and electricity) integration in the Mashreq region (Egypt, Jordan, Palestine Authority, Iraq, Syria and Lebanon) and neighboring countries was completed in June 2010, there is no observable evidence to indicate that this report has led to any financing activity or informed policy in the region.

**ESMAP ACTIVITY: ELECTRICITY TRADE & INTERCONNECTION (P111861)**

**FISCAL YEAR: 2009**

**COUNTRY / REGION: MIDDLE EAST AND NORTH AFRICA**

This objective of this activity was to explore the potential for electricity trade and interconnection between Yemen and countries of the Gulf Cooperation Council (GCC). While a report has been completed under the activity, there is no observable evidence to indicate that this activity has contributed to enhancing electricity trade and interconnection between Yemen and countries of the Gulf Cooperation Council (GCC).

**ESMAP ACTIVITY: GEA BACKGROUND ENERGY PAPERS (P110342)**

**FISCAL YEAR: 2009**

**COUNTRY / REGION: GLOBAL**

This activity could not achieve its objective because of unsatisfactory consultant performance. ESMAP terminated the consultant's contract mid-way after the quality of the outputs was not found to be satisfactory.

**ESMAP ACTIVITY: REGIONAL POWER TRADE STUDY (P108579)**

**FISCAL YEAR: 2010**

**COUNTRY / REGION: GLOBAL**

The objective of this activity was to collect the experiences and lessons from the half-a-dozen most advanced regional electricity projects and help facilitate and accelerate the preparation of regional electricity system integration projects. While the outputs of the TA have been well received by stakeholders, there is no evidence to indicate that the activity has helped facilitate the preparation additional electricity system integration projects.

**ESMAP ACTIVITY: DIAGNOSTIC OF ECONOMIC CRISIS TO INFRASTRUCTURE (P119796)**

**FISCAL YEAR: 2011**

**COUNTRY / REGION: MONGOLIA/ EAST ASIA**

The objective of the activity was to help assess the impact of the financial crisis on the power sector in Mongolia and to identify specific investment and policy measures to respond to the crisis. There is no observable evidence to indicate that the activity informed specific policy or investment actions of either the Government or the World Bank that were taken in response to the crisis.

**ESMAP ACTIVITY: FUEL PRICE RISK & POWER SYSTEMS PLANNING (P110522)**

**FISCAL YEAR: 2009**

**COUNTRY / REGION: GLOBAL**

This ESMAP activity has prepared improved power utility planning methods for developing more robust and diverse energy generation mixes in developing country utilities that minimize risk-adjusted supply costs. However, there is no observable evidence of these methods having been used by client countries.

**ESMAP ACTIVITY: ELECTRICITY SECURITY (P114009)**

**FISCAL YEAR: 2009**

**COUNTRY: REGIONAL**

This ESMAP activity supported an extensive effort to gather information on the electricity sector and development of a more complete database for the electricity sector in the region. This comprehensive database will enable detailed and complete analysis of the electricity sector in the region. However, there is no observable evidence to indicate that this database has been used by client countries.

**ESMAP ACTIVITY: ENERGY PROCUREMENT & AUCTIONS (P112430)**

**FISCAL YEAR: 2009**

**COUNTRY: REGIONAL**

Based on a review of international best practices, this ESMAP activity has assessed the benefits, challenges and pitfalls related to the implementation of different types of energy auctions, including issues pertaining to: (i) auction design, (ii) auction process and (iii) choice of auction over other procurement and contracting mechanisms. However, there is no observable evidence to indicate that this study has been used by client countries.

### Ongoing EASP Activities

**ESMAP ACTIVITY: CLUSTER-INFRA POLICY/REGULATION REFORM (P113836)**

**FISCAL YEAR: 2009**

**COUNTRY / REGION: VIETNAM / EAST ASIA AND PACIFIC**

The objective of this Economic Sector Work (ESW) is to assist the Government of Vietnam (GoV) in reviewing options for the reform of infrastructure State Owned Enterprises (SOEs). The ESW will be delivered as a set of policy notes to GoV on key aspects of SOE reform.

**ESMAP ACTIVITY: REGIONAL ENERGY SECTOR NOTE / (P122951)**

**FISCAL YEAR: 2011**

**COUNTRY / REGION: CAUCASUS / EUROPE AND CENTRAL ASIA**

This activity will form part of a larger regional stock taking exercise in the energy sector of the Southern Caucasus and will contribute towards updating sector notes of the countries in the region, including an in depth assessment Azerbaijan's energy sector.

**ESMAP ACTIVITY: BULGARIA GAS SECTOR STUDY (P118225)**

**FISCAL YEAR: 2010**

**COUNTRY / REGION: ECA**

The overall development objective of the proposed study is to assist Government of Bulgaria in developing an analytical framework to identify an economically efficient set of policies and investment options for the medium term, to help meet existing and future gas demand in the event of gas supply disruptions, without significant social and economic loss.

<b>ESMAP ACTIVITY:</b> UAP-ES ASSESSMENT (P122927)	
<b>FISCAL YEAR:</b> 2011	
<b>COUNTRY / REGION:</b> UZBEKISTAN / ECA	
The objective of the Study is to help Government of Uzbekistan in carrying out the initial assessment of economic and financial viability of about 1000 MW initial electricity trade between Uzbekistan, Afghanistan, and Pakistan. The initial assessment will help all the three governments to take an informed decision on the next steps to realize the regional electricity trade and development opportunities.	

<b>ESMAP ACTIVITY:</b> CENTRAL AMERICA PROGRAMMATIC STUDY 6: ENERGY DIVERSIFICATION (P122936)	
<b>FISCAL YEAR:</b> 2011	
<b>COUNTRY / REGION:</b> CENTRAL AMERICA	
The objective of the proposed program (Module 6 of the Programmatic series) is to support the local authorities in developing necessary regulatory, institutional, and technical capacity, in a just-in-time manner, in order to diversify the regional generation matrix. To accomplish this objective, the program is expected to cover the following technical areas: increasing the share of renewable energy in the matrix, improving energy efficiency, and providing sustainable energy access services to the poor.	

<b>ESMAP ACTIVITY:</b> 5M-AWI ELECTRICITY NETWORKS INTEGRATION (P122363)	
<b>FISCAL YEAR:</b> 2011	
<b>COUNTRY / REGION:</b> MIDDLE EAST AND NORTH AFRICA	
The Study will cover the twenty two Arab countries and will focus on the institutional and regulatory aspects of cross-border trade and electricity market integration between these countries, as well as with potential neighboring markets.	

<b>ESMAP ACTIVITY:</b> ENERGY SECTOR (P110853)	
<b>FISCAL YEAR:</b> 2009	
<b>COUNTRY / REGION:</b> JORDAN / MNA	
The objective of this study is the development of a strategy for deployment of smart grid technology in Jordan.	

<b>ESMAP ACTIVITY:</b> FLAGSHIP ELECTRICITY TECH. OPTIONS ASSESSMENT ( P121518)	
<b>FISCAL YEAR:</b> 2011	
<b>COUNTRY / REGION:</b> GLOBAL	
The primary objective of the proposed activity is to enhance the previous ESMAP reports and develop a user-modifiable and internet-based model to allow comparative assessment of the economic costs of thermal and renewable electricity generation options, as well as power storage.	

<b>ESMAP ACTIVITY:</b> DEVELOPING A REGULATORY FRAMEWORK (P123047)	
<b>FISCAL YEAR:</b> 2011	
<b>COUNTRY / REGION:</b> MALDIVES / EAP	
The objective of this work is to provide technical assistance to the Government of Maldives to develop and implement a sustainable regulatory regime for energy sector.	

<b>ESMAP ACTIVITY:</b> IMPACT OF HIGH AND VOLATILE OIL PRICES (P119291)	
<b>FISCAL YEAR:</b> 2010	
<b>COUNTRY:</b> REGIONAL/LAC	
<b>OUTCOME:</b> INNOVATIVE APPROACHES & SOLUTIONS GENERATED	<b>INDICATOR:</b> NEW INNOVATIVE APPROACHED DEVELOPED
This study objective is to evaluate the impact of oil price volatility on the power sector in LAC and to assess how this fuel price volatility flows through the power sector in affecting overall macroeconomic standing.	

**ESMAP ACTIVITY:** CAIRO CONGESTION STUDY (P121712)

**FISCAL YEAR:** 2010

**COUNTRY/REGION:** EGYPT / MNA

The Objective of this study is at first to assess the baseline for current congestion in Greater Cairo Metropolitan Area, based on which to prepare policy recommendations and an action plan to reduce traffic congestion.

**ESMAP ACTIVITY:** : LUHRI HYDRO ELECTRIC PROJECT (P102843)

**FISCAL YEAR:** 2010

**COUNTRY/REGION:** INDIA / SOUTH ASIA

The activity, which supports the lending operation of the same name, will help to understand the involvement and performance of the private sector in hydropower development in India and evaluate the challenges constraining the private sector to increasingly take on the challenge of the sustainable development of the country's hydropower potential. The ESMAP financed study will contribute to Government of Himachal Pradesh's understanding of the approaches being followed by other Indian States and internationally in attracting investment into hydropower development; and Assist the State Government in refining their private sector participation strategy in hydropower.

**ESMAP ACTIVITY:** SOUTH ASIA REGULATION ENERGY STUDY SERIES (P122369)

**FISCAL YEAR:** 2011

**COUNTRY/REGION:** SOUTH ASIA

This effort will deliver a "composite knowledge product" consisting of a series of focused analytical pieces, consistent with the two supporting pillars of the corporate Energy Strategy. Each piece would examine in greater depth a specific group of questions that have clear operational links.

## 2. ENERGY ACCESS

### Africa Region

**ESMAP ACTIVITY:** CAPACITY BUILDING AMONG SMALL SCALE ENERGY SUPPLIERS (P107574)

**FISCAL YEAR:** 2008-09

**COUNTRY:** BURKINA FASO

**OUTCOME:** DEVELOPMENT FINANCING INFORMED

**INDICATOR:** EXISTING OPERATIONS INFORMED

ESMAP supported activity was initiated when an energy access project was under preparation. The initial discussions of the ESMAP-supported activity was reflected in the Energy Access project's appraisal document, which indicates that the subcomponent to build the capacity of energy service providers will be implemented in collaboration with the ESMAP-supported activity. The Energy Access project was approved by the World Bank in July 2007. The ESMAP support was used to assess constraints and opportunities in involving SMEs in electricity supply. It set the stage for the WB project to improve the regulatory and institutional framework governing the involvement of SMEs in energy service provision.

<i>WB Lending Operation Informed</i>	<i>Project ID</i>	<i>Approval FY</i>	<i>Amount (US\$)</i>
<i>Burkina Faso Energy Access Project</i>	<i>P078091</i>	<i>2008</i>	<i>\$38.8 WB loan</i>

<b>ESMAP Activity:</b> 3A: RENEWABLE ENERGY EDUCATION PROJECT (P120478)	
<b>FISCAL YEAR:</b> 2010	
<b>COUNTRY:</b> BURKINA FASO AND GHANA	
<b>OUTCOME:</b> CLIENT CAPACITY INCREASED	<b>INDICATOR:</b> IMPLEMENTATION CAPACITY STRENGTHENED
<p>The activity was aimed to strengthening the capacities of two West African universities - the International Institute for Water and Environmental Engineering (2IE) in Burkina Faso and The Energy Center at the Kwame Nkrumah University of Science and Technology (TEC/KNUST) in Ghana - to transfer know-how on renewable energy technology to their clients. Although the activity is still ongoing, the two universities have already trained 28 persons and certified 6 persons as trainers on RETScreen and GIS Energy Planning, which indicates an increased capacity to design and offer renewable energy training.</p>	

<b>ESMAP Activity:</b> CAPACITY BUILDING AMONG SMALL-SCALE OFF-GRID ENERGY SUPPLIERS (P107606)											
<b>FISCAL YEAR:</b> 2008-09											
<b>COUNTRY:</b> CAMEROUN											
<b>OUTCOME:</b> DEVELOPMENT FINANCING INFORMED	<b>INDICATOR:</b> PREPARATION OF NEW OPERATION INFORMED										
<p>The activity analyzed the regulatory, legal, and institutional framework of the energy sector in Cameroun. The analysis recommended that the government review the functions of the rural electrification agency and establish a rural energy fund to facilitate SMEs participation in electricity delivery. The activity further helped develop an operational manual for the proposed rural electrification fund.</p> <p>The activity' outputs were incorporated in the design of the Energy Sector Development Project, approved by the World Bank in June 2008. The project includes a US\$ 40 million rural energy fund to provide investment subsidies to rural energy projects.</p>											
<table border="1"> <thead> <tr> <th><i>WB Lending Operation Informed</i></th> <th><i>Project ID</i></th> <th><i>Approval FY</i></th> <th><i>Amount (US\$)</i></th> </tr> </thead> <tbody> <tr> <td><i>Cameroun-Energy Sector Development Project</i></td> <td><i>P104456</i></td> <td><i>2008</i></td> <td><i>65 WB loan</i></td> </tr> </tbody> </table>				<i>WB Lending Operation Informed</i>	<i>Project ID</i>	<i>Approval FY</i>	<i>Amount (US\$)</i>	<i>Cameroun-Energy Sector Development Project</i>	<i>P104456</i>	<i>2008</i>	<i>65 WB loan</i>
<i>WB Lending Operation Informed</i>	<i>Project ID</i>	<i>Approval FY</i>	<i>Amount (US\$)</i>								
<i>Cameroun-Energy Sector Development Project</i>	<i>P104456</i>	<i>2008</i>	<i>65 WB loan</i>								
<p><b>Impacts of WB loan influenced by ESMAP</b></p> <ul style="list-style-type: none"> <li>The rural energy fund was established on December 14, 2009 and first private sector-led projects are still under preparation.</li> <li>2100 community electricity connections provided</li> </ul>											

<b>ESMAP Activity:</b> SCALING UP SMEs PARTICIPATION IN RURAL ELECTRIFICATION (P108841)	
<b>FISCAL YEAR:</b> 2008-09	
<b>COUNTRY:</b> GUINEA	
<b>OUTCOME:</b> POLICY/STRATEGY INFORMED	<b>INDICATOR:</b> GOVERNMENT STRATEGY / POLICY INFORMED
<p>This ESMAP-funded SME technical assistance helped the Decentralized Rural Electrification Agency prepare a rural electrification strategy that is conducive to the involvement of energy SMEs. The agency also designed and initiated four pilot projects to provide solar home systems through SMEs. Although the assistance stopped because of a military coup that led to World Bank ceasing project activities in Guinea, ESMAP support resulted in an enhanced policy and institutional framework that can be built upon to increase electricity access in rural areas.</p>	

<b>ESMAP Activity:</b> AFREA-LIBERIA RURAL ENERGY (PHASE 1) (P118460)	
<b>FISCAL YEAR:</b> 2010	
<b>COUNTRY:</b> LIBERIA	
<b>OUTCOME:</b> CLIENT CAPACITY INCREASED	<b>INDICATOR:</b> IMPLEMENTATION CAPACITY STRENGTHENED
<b>OUTCOME:</b> DEVELOPMENT FINANCING INFORMED	<b>INDICATOR:</b> MOBILIZATION OF NON-BANK RESOURCES INFORMED

The AFREA-funded activity assisted the Ministry of Lands, Mines, and Energy (MLME) to set up and build the capacities of an agency responsible for mobilizing investments and renewable energy services for rural areas. The activity team provided technical and legal services that resulted in President Ellen Johnson Sirleaf issuing an Executive Order establishing a Rural and Renewable Energy Agency (RREA) and its associated Rural Energy Fund as a legal entity, in January 2010. Subsequently, the agency was staffed with advisors who helped develop its financial, procurement, and operational manuals. The agency staff was trained on renewable energy technologies, annual plan development, and use of GIS-based tools for energy planning. The RREA has been operational since April 2010 and was allocated a government budget.

With the enhanced capacity, the RREA has begun preparing a rural energy master plan. It held a stakeholders workshop that identified rural energy priorities, which led to an outline of a rural electrification strategy and to a draft action plan. With the workshop outputs, the RREA applied for and received a 1.5 million Euros grant (US\$1.98 million) from the European Union, in August 2011, to pilot off-grid solar lighting activities in Lofa County and complete the rural energy master plan. The plan will include a spatial analysis of grid extension and priority stand-alone renewable systems for remote villages, using GIS technologies.

**ESMAP ACTIVITY: SUSTAINABLE ENERGY DEV. PROJECT (GEF) (P097818)**

**FISCAL YEAR: 2010**

**COUNTRY: RWANDA**

**OUTCOME: POLICY/STRATEGY INFORMED**

**INDICATOR: GOVERNMENT STRATEGY / POLICY INFORMED**

With the AFREA grant, the Rwandan power and water utility, EWSA, commissioned a study that resulted in the elaboration of a feed-in tariff for electricity generated from micro-hydro plants. The proposed tariff was submitted to the Rwanda Utilities Regulatory Agency (RURA) and was approved in February 2012.

**ESMAP ACTIVITY: INTEGRATING SMES IN TANZANIA'S RURAL ENERGY INITIATIVES (P107301)**

**FISCAL YEAR: 2008-09**

**COUNTRY: TANZANIA**

**OUTCOME: POLICY/STRATEGY INFORMED**

**INDICATOR: GOVERNMENT STRATEGY / POLICY INFORMED**

**OUTCOME: INNOVATIVE APPROACHES AND SOLUTIONS GENERATED**

**INDICATOR: NEW INNOVATIVE APPROACH DEVELOPED**

The activity assisted the Tanzanian Energy and Water Utilities Regulatory Authority (EWURA) and the Rural Energy Agency (REA) to develop standardized power purchase agreements for projects under 10MW, and simplified regulatory procedures for projects under 1 MW.

ESMAP-assisted, light-handed regulatory procedures and power purchase agreements have been considered good practices in Eastern Africa. A number of regulatory agencies in East Africa conducted study tours to learn from the Tanzanian regulatory mechanisms. The experience has been disseminated for possible adoption to other African countries. For instance, it was presented at Africa Electrification Initiative's Maputo workshop, which was attended by representatives from more than 32 Sub-Saharan African countries. The Tanzanian SPP regulatory system was also presented to electricity regulators from 10 Southern African countries at the 2009 annual meeting of the Regional Electricity Regulatory Association of Southern Africa (RERA).

The agreements and procedures were included in Tanzania's Electricity Act and formally adopted by EWURA in 2009. EWURA expanded on this initial work and leveraged SIDA funds to prepare Guidelines for Small Power Producers (SPPs). Under this enhanced regulatory framework, five Standardized Power Purchase Agreements have been signed with the national electricity utility, TANESCO, for 24 MW and four Letters of Intent have been drafted for estimated sales of 17.8 MW. Two projects with commitment to supply 10.4 MW are selling power to TANESCO.



<b>ESMAP ACTIVITY: LIGHTING RURAL TANZANIA (P117260)</b>			
FISCAL YEAR: 2010			
COUNTRY: TANZANIA (FUNDED BY AFREA)			
<b>OUTCOME: DEVELOPMENT FINANCING INFORMED</b>		<b>INDICATOR: EXISTING OPERATIONS INFORMED</b>	
<p>The activity complements the World Bank-financed Tanzania Energy Development and Access Expansion Project (TEDAP). It provides TEDAP with a parallel additional financing to develop sustainable business models that would enable access to efficient, clean and affordable lighting for the Tanzanian poor. The activity is being implemented by the Tanzanian Rural Energy Agency (REA), which is also carrying out TEDAP's small power component. The REA coordinated an open and competitive selection of 10 private operators who were granted up to US\$100,000 each to implement proposed pilots following a results-based financing approach. Although the activity is still under implementation, it has yielded noticeable results.</p>			
<i>WB Lending Operation Informed</i>	<i>Project ID</i>	<i>Approval FY</i>	<i>Amount (US\$)</i>
<i>Tanzania Energy Development and Access project</i>	<i>P101645</i>	<i>2008</i>	<i>111.5 WB loan</i>
<p><b>Direct impacts of AFREA-funded activity.</b> The selected private operators sold over 6,000 solar lanterns, installed 1,500 solar home systems, and equipped 12 schools and 40 health clinics with PV systems.</p> <p><b>Impacts of World Bank loan influenced by ESMAP activity</b></p> <ul style="list-style-type: none"> <li>Signed Standardized power purchase agreements will add 24.4 MW electricity from renewable energy sources</li> <li>REA fully functional</li> </ul>			

<b>ESMAP ACTIVITY:</b>	
<ul style="list-style-type: none"> <li>P116289- TASK 3: LIGHTING AFRICA MARKET DEVELOPMENT AND QA</li> <li>P113808-LIGHTING AFRICA DEVELOPMENT MARKETPLACE AWARDEES SUPERVISION</li> </ul>	
FISCAL YEAR: 2009	
COUNTRY: TANZANIA	
<b>OUTCOME: CLIENT CAPACITY INCREASED</b>	<b>INDICATOR: IMPLEMENTATION CAPACITY STRENGTHENED</b>
<p>Under a competitive grant program sponsored by the Lighting Africa Initiative, AFREA funded three award-winning projects in Namibia, Nigeria, and Tanzania. Although the award recipients in Namibia and Nigeria faced difficulties, the Tanzanian recipient successfully implemented its proposal. It resulted in 42,000 LED lanterns and other lighting products sold, providing improved lighting to 8,450 households and 331 organizations, while creating 123 local jobs. Lessons learned from the grant-funded initiative have informed the design of the Lighting Rural Tanzania activity, which adopted a similar approach to providing grants.</p>	

<b>ESMAP ACTIVITIES:</b>	
<ul style="list-style-type: none"> <li>3A-ESMAP LIGHTING AFRICA (P106178)</li> <li>SOLAR LANTERN TESTING &amp; CERTIFICATION (P109027)</li> <li>TASK 2: LIGHTING AFRICA-2010 CONFERENCE (P116277)</li> </ul>	
FISCAL YEAR: 2008 (P106178), 2008 (P109027), 2009 (P116277)	
COUNTRY: REGIONAL	
<b>OUTCOME: POLICY/STRATEGY INFORMED</b>	<b>INDICATOR:</b>
	<ul style="list-style-type: none"> <li>GOVERNMENT STRATEGY / POLICY INFORMED</li> <li>DEV'T COMMUNITY/PARTNER POLICY/STRATEGY INFORMED</li> </ul>
<b>OUTCOME: INNOVATIVE APPROACHES AND SOLUTIONS GENERATED</b>	<b>INDICATOR: NEW INNOVATIVE APPROACH DEVELOPED</b>
<p>Lighting Africa (LA) is a joint IFC and World Bank program that aims to mobilize the private sector to provide reliable and affordable lighting to 250 million people. LA comprised several components including: business</p>	



support, consumer education & outreach, policy & regulation, and quality assurance. LA provided business support services to over 1900 companies and 2,500 individual members. Through over 100 road shows and 500 forums, LA reached out to 11 million people in rural Kenya and 675,000 people in Ghana, raising their awareness of the benefits of clean and affordable off-grid lighting while showcasing products. Under the policy & regulation component, studies to foster favorable policy and regulatory environments for commercializing lighting products were conducted in eight countries including Ethiopia. To ensure quality of lighting products being sold, LA developed standards and test procedures as well as equipped a laboratory at the University in Nairobi, Kenya, to provide low-cost screening tests to manufacturers and distributors.

LA's policy and regulatory study in Ethiopia resulted in the Government of Ethiopia waiving duties on all off-grid lighting products that meet or exceed LA-recommended performance targets.

Lighting Africa's activity has enabled the certification of quality lighting products for consumers who rely on candles and kerosene for lighting. In 2007, there were no quality-certified off-grid lighting products on the African markets, and no affordable test methods to certify quality for this low-cost segment. With LA's first-ever standards and testing methods, 18 products were certified.

The United Nations Framework Convention on Climate Change (UNFCCC) used the Lighting Africa-developed, standards and testing procedures to build up the CDM methodology for off-grid lighting.

Also, Lighting Africa has been chairing the GEF/UNDP En.Lighten Project Steering Committee, leading efforts to harmonize quality assurance systems across different organizations and continents in order to enhance off-grid lighting markets.

#### **Direct impacts of LA**

LA has significantly contributed to transform the off-grid lighting market in Sub-Saharan Africa. With LA support, lighting product sales have more than quadruple (sales increased of 450%) in FY 2011. Since 2010 close to 1.5 million people in Africa have acquired cleaner and safer lighting products. Lighting Africa's target of reaching 2.5 million people by 2012 is likely to be achieved.

**ESMAP ACTIVITY: BIOMASS ENERGY INITIATIVE (P116419)**

**FISCAL YEAR: 2009**

**COUNTRY: REGIONAL (FUNDED BY AFREA)**

**OUTCOME: DEVELOPMENT FINANCING INFORMED**

**INDICATOR:**

- PREPARATION OF NEW OPERATION INFORMED
- MOBILIZATION OF NON-BANK RESOURCES INFORMED

The Biomass Energy Initiative in Africa (BEIA) aims to test promising biomass energy building blocks that have the potential to be incorporated in future Bank's operations. The initiative comprises activities executed by both AFTEG and recipient organizations in Sub-Saharan Africa.

The recipient-executed activities provided NGOs and private organizations with grants to implement nine biomass pilot projects in Benin, Ethiopia, Gambia, Kenya, Uganda, Rwanda, Tanzania, and South Africa. Although the pilots are at different stages of implementation, two have already leveraged non-Bank funding. The grant recipient in Gambia, the Center for Research in Energy and Energy Conservation, obtained a US\$500,000 grant from USAID to scale up efforts to disseminate locally manufactured stoves. Also, the grant recipient in Ethiopia, Gaia Association, successfully leveraged 346,059 Euros (US\$456,800) from the Nordic Climate Fund to pilot other micro plants distilling ethanol for cooking.

The AFTEG-executed activity published an issues-and-approach paper on "Wood-Based Biomass Energy Development for Sub-Saharan Africa." The team that produced the paper shared knowledge and supported the WB team assisting DRC government in preparing an investment plan for funding under the CIF's forest investment program (FIP). Through this support, the paper has informed the preparation of the investment plan.

The BEIA's paper has also informed the preparation of another AFTEG-led initiative, the Africa Clean Cooking Initiative (ACCI). ACCI builds on BEIA's efforts to enable market conditions for high quality and performance cooking stoves and aims to promote enterprise-based, large-scale dissemination and adoption of clean cooking solutions in Sub-Saharan Africa. ACCI's concept was launched in November 2011 and is supported by ESMAP, GPOBA, and PPIAF.

AFREA's BEIA Operation Informed	Total financing (US\$)
<i>P128887 - DRC Forest Investment Program [(FY2013) – in pipeline for FIP]**]</i>	<i>60 FIP</i>
<i>Gambia – Promotion of Improved Biomass Vesto Stoves (funded by USAID) – FY 2012</i>	<i>0.5</i>
<i>Ethiopia – Promotion of Ethanol Micro-Distilleries Project (funded by the Nordic Climate Fund) – FY 2012</i>	<i>0.4</i>

*\*\*FIP stands for Forest Investment Program, which is one the three strategic climate funds constituting the Climate investment Funds (CIF).*

<b>ESMAP ACTIVITY: ESMAP SWAP INVESTMENT &amp; POLICY / RWANDA &amp; KENYA (P107546) RW&amp;KE</b>			
FISCAL YEAR: 2008			
COUNTRY: REGIONAL (FUNDED BY ESMAP AND AFREA)			
OUTCOME : DEVELOPMENT FINANCING INFORMED		INDICATOR:	
		<ul style="list-style-type: none"> <li>• PREPARATION OF NEW OPERATION INFORMED</li> <li>• MOBILIZATION OF NON-BANK RESOURCES INFORMED</li> </ul>	
OUTCOME : POLICY/STRATEGY INFORMED		INDICATOR: BANK COUNTRY STRATEGY INFORMED	
OUTCOME : INNOVATIVE APPROACHES AND SOLUTIONS GENERATED		INDICATOR: NEW INNOVATIVE APPROACH DEVELOPED	
<p>The activity, funded by both ESMAP and AFREA, assisted the governments of Rwanda and Kenya to develop energy access scale-up plans, using GIS-based lowest-cost spatial planning and applying a sector-wide approach. The developed plans included energy access targets and estimated investments required to meet the targets.</p> <p>The developed plans led to the preparation of World Bank-financed energy access projects and mobilization of non-Bank resources. With the plans, the Government of Rwanda and Kenya held donor roundtable conferences, where donors pledged funding to support the implementation of the plans: US\$228 million for Rwanda and US\$ 1.5 billion for Kenya. On this basis, the Government of Rwanda and Kenya, with World Bank assistance, prepared the (1) Rwanda Electricity Access Scale-up and Sector Wide Approach Development project and the (2) Kenya Electricity Expansion Project, which were partially financed by the World Bank: US\$70 million for Rwanda and US\$330 million for Kenya.</p> <p>The sector wide approach, used to prepare the national electricity access programs in Rwanda and Kenya, was adopted in subsequent World Bank's country assistance strategies. The FY2009-2012 Country Assistance Strategy for Rwanda pointed out that the World Bank will support energy sector reform by, in part, ensuring progress on an energy sector wide approach focused on access expansion. Similarly, the 2010-2013 Country Partnership Strategy for Kenya indicates that the World Bank will follow a sector wide approach in different sectors including the energy sector.</p> <p>The use of geographic information tools to determine grid electrification plans in the electricity access programs has been hailed as innovative. Energy planners in Rwanda and Kenya have adopted the GIS tools used to forecast electricity demand, identify priority areas, select least-cost electrification options, and illustrate options to roll out grid electrification up to 2020. This was the first time such GIS tools were used in electrification planning in Rwanda and Kenya.</p>			
<b>WB Lending Operation Informed</b>	<b>Project ID</b>	<b>Approval FY</b>	<b>Amount (US\$)</b>
<i>Rwanda Electricity Access Scale-up and Sector Wide Approach Development Project</i>	<i>P111567</i>	<i>FY2010</i>	<i>70 WB loan</i>
<i>Kenya Electricity Expansion Project</i>	<i>P103037</i>	<i>FY2010</i>	<i>330 WB loan</i>
Donor funding: \$228 M in donor funding for Rwanda + \$1.5 billion for Kenya			
IMPACTS OF WB LOAN INFLUENCED BY ESMAP:			
<ul style="list-style-type: none"> <li>• 99,000 households, 11 health centers, and 6 schools connected to electricity in Rwanda.</li> </ul>			

<b>ESMAP ACTIVITY:</b> 3A-ESMAP IMPLEMENT ACTION PLAN FOR ENERGY ACCESS SCALE-UP IN AFRICA (P103456)	
<b>FISCAL YEAR:</b> 2008-09	
<b>COUNTRY:</b> REGIONAL (FUNDED BY BOTH ESMAP AND AFREA)	
<b>OUTCOME:</b> POLICY/STRATEGY INFORMED	<b>INDICATOR:</b> <ul style="list-style-type: none"> <li>BANK SECTOR STRATEGY INFORMED</li> <li>PUBLIC DEBATE STIMULATED/INITIATED</li> </ul>
<p>The activity included: (i) an update of the Africa Energy Strategy funded by AFREA, (ii) a ministerial roundtable discussion on “What Would it Take to Transform Africa’s Energy Sector” funded by AFREA, and (iii) an African energy Ministers Conference “Road to Durban: Promoting Sustainable Energy Access for Africa” funded by ESMAP. The updated Africa Energy Strategy diagnoses the energy access challenges in Sub-Saharan Africa, presents core business lines to be pursued, and proposes a plan to implement the strategy. The strategy was annexed to the draft World Bank’s Energy Sector Strategy.</p> <p>In addition to the strategy, a ministerial roundtable discussion was held in April 2011 as a side event to the World Bank Spring Meetings. The roundtable brought together over 20 ministers and 200 external participants and World Bank staff to brainstorm on what needs to be done to address Africa’s power shortfall. Nearly 600 people connected on live-stream to watch the discussions, indicating a great interest from the public. Also the associated short movie on “Africa’s vision for 2020” that was prepared is still one of the most clicked videos on the Africa region webpages.</p> <p>The Africa Energy Ministers Conference “<i>Road to Durban: Promoting Sustainable Energy Access in Africa</i>” was held in Johannesburg on September 15-16, 2011. The conference, hosted by the South Africa’s Department of Energy and the African Union and officially supported by ESMAP, the World Bank and the United Nations Industrial Development Organization, brought together over 40 Energy Ministers or Deputy Ministers and representatives from regional economic communities and power pools. The conference offered a unique opportunity to highlight Africa’s energy challenges and gain global support to Africa’s transformational energy agenda. Energy Ministers reached consensus on the Johannesburg Declaration, which informed policy discussion and catalyze action at COP-17.</p>	

<b>ESMAP ACTIVITY:</b> 3A-ESMAP AFR. ELECTRIFICATION EXPERIENCE (P110999)	
<b>FISCAL YEAR:</b> 2008	
<b>COUNTRY:</b> Regional	
<b>OUTCOME:</b> KNOWLEDGE INCREASED	<b>INDICATOR:</b> FACILITATED EXCHANGE OF BEST PRACTICES WITH CLIENTS
<p>Africa Electrification Initiative was designed in late 2008 to respond to the need to better document successes and challenges of electrification programs in Sub-Saharan Africa and to encourage electrification practitioners to learn from each other.</p> <p>The initiative’s first phase was launched at a workshop in June 2009 in Maputo, where over 170 electrification practitioners from 42 countries shared ground-level implementation experiences, established a network of electrification practitioners, refined topic areas where SSA practitioners face the most significant knowledge constrains, and identified suitable, long-term dissemination mechanisms. The second phase involved sharing knowledge (discussion and research papers); establishing long-term dissemination mechanisms including website, blog, online archive of operational documents; enhancing the established network of senior SSA electrification practitioners; and holding thematic mini-workshops.</p> <p>AEI recently held a workshop in Dakar in November 2011, which brought together over 200 electrification practitioners who shared the lessons learned from Rural Electrification agencies’ experiences on specific topics including low-cost design, connection subsidies, tariffs, productive uses, rural electrification planning, financing renewable energy development, and sustainable solar PV solutions.</p> <p>Through the workshops, online archive, and network, AEI facilitates the dissemination of best practices in designing and implementing rural electrification projects. A participant from a Rural Energy Agency commented as an AEI thematic workshop: “<i>As high connection charges are a stiff barrier to access in my country, I am planning to immediately introduce measures discussed here at the workshop.</i>” Another participant stated: “<i>I am going to probe some of the new low-cost technologies being used by other practitioners for possible adaptation in my own country.</i>”</p>	

## East Asia and Pacific Region

<b>ESMAP ACTIVITY: DECENTRALIZED ENERGY SERVICES FOR IDA COUNTRIES ( P095219)</b>			
FISCAL YEAR: 2009			
COUNTRY: CAMBODIA			
<b>OUTCOME: DEVELOPMENT FINANCING INFORMED</b>		<b>INDICATOR: EXISTING OPERATIONS INFORMED</b>	
<p>ESMAP helped two organizations-Centre Krom Ngoy and EDC-Training center-to train 122 rural electricity enterprises (REEs) on business management and electricity loss reduction. The training resulted in many REEs reporting 20% decrease of electricity losses. Under a separate component, ESMAP supported local artisans and home-based entrepreneurs to produce and disseminate improved cookstoves following a market-based approach.</p> <p>The activity has influenced the operations of an ongoing World Bank project. The positive feedback from the trainees and the reported results led to the Rural Electrification Fund, an agency implementing a component of the WB-financed Rural Electrification and Transmission project, providing similar training to new licensed REEs and advanced training to REEs that attended ESMAP-supported training.</p> <p>Besides, ESMAP's support to disseminate improved cookstoves led to 8,000 improved cookstoves and 40 efficient palm sugar stoves sold.</p>			
<b>WB Lending Operation Informed</b>	<b>Project ID</b>	<b>Approval FY</b>	<b>Amount (US\$)</b>
<i>Cambodia Rural Electrification and Transmission Project</i>	<i>P064844</i>	<i>FY2004</i>	<i>40 WB loan</i>
<b>Impacts of World Bank loan influenced by ESMAP activity</b>			
<ul style="list-style-type: none"> <li>• 45,097 new rural households connected to electricity</li> <li>• 243 licenses issued to independent power producers and rural electrification enterprises</li> </ul>			

<b>ESMAP ACTIVITY: GENDER AND ENERGY GAP (P111786)</b>	
FISCAL YEAR: 2008	
COUNTRY: CAMBODIA	
<b>OUTCOME: POLICY/STRATEGY INFORMED</b>	<b>INDICATOR: CONTRIBUTED TO STAKEHOLDER INVOLVEMENT</b>
<p>ESMAP supported a study that assessed gender considerations in disseminating improved cook stoves, bio-digesters, and LED lanterns. The gender assessment complemented the ESMAP SME activity, in which household technology dissemination strategies were examined. The assessment revealed that the technologies that were being commercialized, improve the lives of families in particular women. This finding supported greater involvement of women in setting up retail networks at village level. 8,000 improved cookstoves were sold with women involved in the stove production and commercialization. This result was further enhanced under an ASTAE-supported activity that led to the production of 3,000 stoves per month with the involvement of 10 SMEs.</p>	

<b>ESMAP ACTIVITY:</b>	
<ul style="list-style-type: none"> <li>▪ P107193 - SMEs IN DECENTRALIZED ENERGY SERVICE</li> <li>▪ P120983 - STIMULATING SMEs FOR PRODUCTIVE USE OF ELECTRICITY</li> </ul>	
FISCAL YEAR: 2008 (P107193), 2010 (P120983)	
COUNTRY: LAO PDR	
<b>OUTCOME : DEVELOPMENT FINANCING INFORMED</b>	<b>INDICATOR:</b>
	<ul style="list-style-type: none"> <li>• EXISTING OPERATIONS INFORMED</li> <li>• PREPARATION OF NEW OPERATION INFORMED</li> </ul>
<b>OUTCOME: CLIENT CAPACITY INCREASED</b>	<b>INDICATOR: IMPLEMENTATION CAPACITY STRENGTHENED</b>
<p><b>P107193 - SMEs in Decentralized Energy Service:</b> The ESMAP-supported activity has supported the implementation of an ongoing rural electrification project and influenced the preparation of a second rural electrification project. The activity was initiated during the implementation of the first phase of the Rural</p>	

Electrification project financed by the World Bank. The project includes a sub-component to develop alternative financing mechanisms, including a dedicated fund, to support rural electrification. The development of the rural electrification fund was supported by ESMAP, whose funding enabled the recruitment of an international consultant who assisted the Ministry of Energy in preparing the rural electrification fund (REF)'s operational manual with a view to enable the private sector to have access to the fund. The prepared manual has set the stage for making the REF operational. The adoption of the manual was required as an effectiveness condition of the second phase of the Rural Electrification Project (REP II), approved by the World Bank in January 2010.

#### Impacts of WB loan influenced by ESMAP

- 14,081 households in 230 villages were electrified by solar home systems
- 51,625 households in 570 villages were electrified through grid extension

The Rural Electrification Fund (REF) was established and operational in September 2010

<i>WB Lending Operation Informed</i>	<i>Project ID</i>	<i>Approval FY</i>	<i>Amount (US\$)</i>
<i>Rural Electrification Phase I Project of the Rural Electrification (APL) Program</i>	<i>P075531</i>	<i>FY2006</i>	<i>13.75 WB loan</i>
<i>Lao Rural Electrification Project – Phase II</i>	<i>P110978</i>	<i>FY2010</i>	<i>25.7 WB loan</i>

**P120983 - Stimulating SMEs for Productive Use of Electricity:** Following the first support, ESMAP further funded a second technical assistance activity, aimed at supporting SMEs to increase income-generating services that are linked to the use of electricity. The activity was integrated as a sub-component of the Rural Electrification Project II (REP II).

The activity team, in close collaboration with a unit of the national electricity utility (EdL), the electricity department of the Ministry of Energy and Mineral Resources, and district government representatives, conducted a market analysis of current businesses and services, as well as major agro-processing and other income-generating activities in six selected provinces connected to grid-based electricity and in 10 rural villages with off-grid power supply. The vast majority of the business owners surveyed recognized the potential for expanding their enterprises with electricity access, but pointed out critical challenges they faced to do so. Based on this feedback, the team proposed measures to promote productive uses of electricity. The proposed measures include educating consumers, providing technical assistance, helping business owners access financing and credit, and facilitating business investment and expansion. The measures also highlighted the important role that the national electricity utility company (EdL) can play in implementing the measures.

The activity has also contributed to increase the capacity of the EdL. Prior to the activity, EdL was interested in promoting productive uses of electricity but was lacking the required capacity. After the activity, EdL has acquired the required skills because of its closed involvement in carrying out the market analysis and developing the recommendations. EdL is now well equipped to implement measures promoting productive uses of electricity in its rural service areas.

#### ESMAP ACTIVITY: RURAL ENERGY PROJECT (P099764)

FISCAL YEAR: 2008

COUNTRY: MONGOLIA

OUTCOME: CLIENT CAPACITY INCREASED

INDICATOR: IMPLEMENTATION CAPACITY STRENGTHENED

The activity was launched few months after the WB approved the Renewable Energy and Rural Energy Access Project (REREAP). The project included a component to enhance a rural retail network of private providers of solar home systems. But the capability of the project implementing unit to strengthen capacities of private solar home systems providers was weak. The activity assisted the project implementing unit in developing an operational manual that lays out a practical step-by-step methodology for providing demand-driven and effective business development services to Small and Medium size Enterprises.

## Latin America and Caribbean Region

**ESMAP ACTIVITY:** STRENGTHENING SMALL-SCALE OFF-GRID ENERGY SUPPLIERS (P105119)

**FISCAL YEAR:** 2007-09

**COUNTRY:** BOLIVIA

**OUTCOME:** DEVELOPMENT FINANCING INFORMED

**INDICATOR:**

- EXISTING OPERATIONS INFORMED
- MOBILIZATION OF NON-BANK RESOURCES INFORMED

Before the ESMAP-funded activity was initiated, the *Decentralized Infrastructure for Rural Transformation Project (IDTR)*, financed by the World Bank, was under implementation. The project included a solar PV market development sub-component to improve access to electricity in rural areas.

The ESMAP-funded activity complemented the IDTR project. It assessed IDTR's solar home systems model and drew lessons that were incorporated in revised medium-term service contracts, used to involve SMEs to supply solar home systems to households. It also assisted the government in developing a new market for "Pico-PV"-powered (5-20 Wp) lighting kits, targeting the rural poor.

In addition, the activity assisted in designing a pilot project to disseminate 3000 Pico-PV systems, which was proposed to and later funded by GPOBA, leveraging \$5.4 million.

WB Lending Operation Informed	Project ID	Approval FY	Amount (US\$)
<i>Bolivia Decentralized Infrastructure for Rural Transformation Project</i>	<i>P073367</i>	<i>FY2003</i>	<i>20 WB loan</i>

**Impacts of World Bank loan influenced by ESMAP activity**

- 10,174 PV systems installed
- 6 medium-term service contracts for SHS awarded and signed
- New regulatory framework for rural electrification and ICT enacted

**ESMAP ACTIVITY:** IFCSME - OFF-GRID RURAL ELECTRIFICATION SME PROGRAM

**FISCAL YEAR:** 2008

**COUNTRY:** BOLIVIA

**OUTCOME:** CLIENT CAPACITY INCREASED

**INDICATOR:** IMPLEMENTATION CAPACITY STRENGTHENED

ESMAP assisted TDE, Bolivia's largest electricity transmission company, to conduct studies that led to the identification of solar PV-powered LED lanterns and energy-efficient wood stoves as suitable technologies to be promoted in villages within TDE's operation area. Subsequently, TDE designed and implemented pilot projects that resulted in over forty families acquiring a LED lantern and a woodstove, both wholly financed under the enterprise's corporate social responsibility program.

The assistance also contributed to mobilize non-Bank resources. After completing the pilot projects, TDE established a strategic alliance with GTZ (the German Cooperation Agency) to scale up the pilots with a focus on energy efficient woodstoves. GTZ committed over US\$300,000, which were used to support large scale dissemination of cook stoves.



<b>ESMAP ACTIVITY:</b> <ul style="list-style-type: none"> <li>▪ P103968 - WOODFUELS: PROMOTING EFFICIENT STOVES</li> <li>▪ P095153 - ESMAP - DECENTRALIZED ENERGY SERVICES</li> <li>▪ P125192 – TECHNICAL ASSISTANCE HOUSEHOLD AND OTHER ENERGY SECTOR</li> </ul> <b>FISCAL YEAR:</b> 2007 (P103968), 2008 (P095153), 2011 (P125192) <b>COUNTRY:</b> HAITI	
<b>OUTCOME :</b> DEVELOPMENT FINANCING INFORMED	<b>INDICATOR:</b> PREPARATION OF NEW OPERATION INFORMED
<b>OUTCOME :</b> POLICY/STRATEGY INFORMED	<b>INDICATOR:</b> GOVERNMENT STRATEGY / POLICY INFORMED
<p>The three ESMAP activities have influenced the design and preparation of the <i>Haiti Rebuilding Energy Infrastructure and Access Project (P127203)</i>, scheduled for approval in July 2012.</p> <p><u>Woodfuels - Promoting Efficient Stoves:</u> The activity piloted improved cook stoves dissemination, designed based on recommendations from a “<i>Strategy to Alleviate the Pressure of Fuel Demand on National Wood Fuel Resources</i>”, which was prepared with ESMAP’s previous support.</p> <p><u>ESMAP - Decentralized Energy Services:</u> The cookstoves dissemination pilot was followed up with an ESMAP-funded reconnaissance mission in Haiti to draw lessons from the pilot and explore follow-up support. Based on the mission findings, a preliminary follow-up program was developed and discussed with the LCSEG, the energy unit of the LAC region. The discussions led to LCSEG preparing a follow-up technical assistance to the Haitian Ministry of Public Works, Transport and Communication (MTPTC).</p> <p><u>Technical Assistance household and other energy sector:</u> The technical assistance to MTPTC aims to develop energy sector policies and investment operations focusing on capacity development, household energy, and planning. Although the assistance is still ongoing, it provided MTPTC with coordinators on household energy and rural electrification, who are key members of a team preparing an investment project-Haiti Rebuilding Energy Infrastructure and Access Project- to be partly financed by the World Bank. The project’s integrated safeguards data sheet (ISDS) mentioned that the sub-component to strengthen Haitian government’s oversight of the energy sector will be carried out in coordination with ESMAP-funded TA.</p> <p>Besides the influence on the preparation of the World Bank project, ESMAP-supported activities have informed the preparation of an energy strategy paper. The lessons learned from the stoves dissemination pilot and the strategy to reduce wood fuel demand informed the inclusion of household energy interventions into a post-earthquake energy strategy paper prepared jointly by USAID, IDB, and World Bank. The paper was presented to and adopted by the Government of Haiti.</p> <p><b>Direct impacts of ESMAP-supported activity.</b> The cookstoves dissemination pilot resulted in 11,000 improved cookstoves sold by local SMEs in Haiti.</p>	

<b>ESMAP ACTIVITY:</b> TECHNICAL ASSISTANCE FOR IMPROVED SMALL-SCALE ENERGY SUPPLY (P103865) <b>FISCAL YEAR:</b> (2007) BUT STARTED DISBURSING IN 2008 <b>COUNTRY:</b> NICARAGUA	
<b>OUTCOME:</b> POLICY/STRATEGY INFORMED	<b>INDICATOR:</b> GOVERNMENT POLICY / STRATEGY INFORMED
<p>The activity analyzed a new market segment for lanterns powered by PV modules from 5 to 20 Wp and found a strong demand for two types of lanterns costing between US\$20 and US\$50. It also indicated that financing barriers could be overcome by tapping into existing rural micro-finance institutions. The study’s findings on potential demand of solar PV lanterns were useful and timely. It informed the development of the national electrification and renewable energy program led by the Ministry of Energy and Mines was developing.</p>	



<b>ESMAP ACTIVITY: JOINT INFO-DEV /ESMAP SME ASSESSMENT (P120429)</b> <b>FISCAL YEAR: 2010</b> <b>COUNTRY: NICARAGUA</b>	
<b>OUTCOME: POLICY/STRATEGY INFORMED</b>	<b>INDICATOR: DEVELOPMENT COMMUNITY/PARTNER POLICY/STRATEGY INFORMED</b>
<p>The original activity scope was to assess opportunities to develop and strengthen SMEs providing renewable energy services in Nicaragua, and if opportunities exist, to establish a business incubator to support renewable energy SMEs. The assessment concluded that it was premature to establish a business incubator. With this increased knowledge, the activity team and their key partners decided to not establish the initially planned business incubator.</p>	

<b>ESMAP ACTIVITY: PROMOTION OF PRODUCTIVE USES OF ELECTRICITY (P123643)</b> <b>FISCAL YEAR: 2011</b> <b>COUNTRY: PERU</b>															
<b>OUTCOME: CLIENT CAPACITY INCREASED</b>	<b>INDICATOR: IMPLEMENTATION CAPACITY STRENGTHENED</b>														
<b>OUTCOME: DEVELOPMENT FINANCING INFORMED</b>	<b>INDICATOR: EXISTING OPERATIONS INFORMED</b>														
<p>The ESMAP-supported activity was initiated when the World Bank-financed First Rural Electrification project was being implemented and the Second Rural Electrification project was being prepared. The First Rural Electrification project includes a pilot to promote productive uses of electricity in rural areas. The pilot implementation resulted in 1,466 families adopting electric equipment to process cereals, coffee, cocoa, baked goods, meat products, milk, wood, and metal products in villages near Curzo, a city in southeastern Peru.</p> <p>ESMAP support aimed to sustain, scale-up, and replicate the Curzo pilot. The support served to hire an international expert in productive uses of electricity, who worked with the agency implementing the First Rural Electrification project and NGOs contracted to promote productive uses of electricity. The ESMAP-supported activity has increased the capacity of the agency implementing the First Rural Electrification (RE) project. The expert's assistance enabled the agency to: (i) standardize reporting frameworks for the NGOs; (ii) review and revise the methods used by NGOs to identify potential productive activities and reach out to potential beneficiaries; (iii) and build channels for knowledge exchange among NGOs.</p> <p>The expert's work has informed the implementation of the productive uses pilot of the first RE project and influenced the design of the productive uses activities for the second RE project. The expert has helped the implementing agency and NGOs enhanced the provision of services that have resulted in an increased number of home-based enterprises using electrical equipment. Besides, as part of the preparation of the second RE project, the expert proposed ideas to improve the timing and cost-benefit analysis of productive uses activities as well as to involve local governments. These ideas were incorporated in the design of productive uses activities within a component of the Second Rural Electrification project.</p>															
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<i>Peru Second Rural Electrification Project</i>	<i>P117864</i>	<i>FY2011</i>	<i>50 M WB loan</i>												
<p><b>Direct impacts of ESMAP-supported activity.</b> The ESMAP-supported pilots to promote productive uses of electricity resulted in over 4,760 families/micro-enterprises adopting electrical equipment to process cereals, coffee, cocoa, baked goods, meat products, milk, wood and metal products, as well as to pump water for expanded agricultural production and processing.</p>															

<b>COUNTRY / REGION:</b> SMEs Energy Services Delivery in Peru (P104354)	
<b>FISCAL YEAR:</b> 2008	
<b>ESMAP ACTIVITY:</b> PERU	
<b>OUTCOME:</b> POLICY/STRATEGY INFORMED	<b>INDICATOR:</b> GOVERNMENT STRATEGY / POLICY INFORMED
<p>The activity assessed SME participation in the delivery of rural energy services. The assessment found that incomplete or absent regulatory frameworks restrict the involvement of (i) distribution company services using individual PV systems and (ii) SMEs operating or owning micro and small hydro power networks-in electricity delivery. The findings resulted in regulatory and policies changes. The electricity sector regulator established a tariff band for individual PV systems within the national tariff framework and ruled that electricity distribution companies providing PV systems services were eligible for a cross subsidy to make the service more affordable. Also, the General Directorate for Rural Electrification (DGER) introduced guidelines setting capital cost subsidies for rural electrification from solar PV.</p>	

<b>ESMAP ACTIVITY:</b> IMPROVED COOK STOVE FRAMEWORK (P124390)	
<b>FISCAL YEAR:</b> 2011	
<b>COUNTRY:</b> CENTRAL AMERICA REGION	
<b>OUTCOME:</b> DEVELOPMENT FINANCING INFORMED	<b>INDICATOR:</b> MOBILIZATION OF NON-BANK RESOURCES INFORMED
<p>ESMAP is supporting the development of an Improved Cook Stove (ICS) toolkit that assesses technical performance, as well as socioeconomic and cultural aspects of cook stove uses in Central American countries. Although the activity is ongoing, the activity team has already assisted the unit preparing the SREP investment plan for Honduras in defining studies needed to disseminate improved cook stoves successfully. The assistance resulted in the SREP investment plan including a subcomponent to disseminate 50,000 improved cook stoves, under the component 3 of the plan – Sustainable Rural Energization. SREP funding amounts to US\$30 million.</p>	

<b>ESMAP ACTIVITY:</b> BENCHMARKING ANALYSIS OF ELECTRICITY DISTRIBUTION CENTER (P110668)	
<b>FISCAL YEAR:</b> 2008	
<b>COUNTRY:</b> REGIONAL	
<b>OUTCOME:</b> KNOWLEDGE INCREASED	<b>INDICATOR:</b> FACILITATED EXCHANGE OF BEST PRACTICES WITH CLIENTS
<p>The activity overhauled an existing database on electricity distribution utilities in the LAC region and added information on new utilities, expanding the database coverage from 70 percent of the electricity connections in the region to 89 percent. The overhauled database provided a clearer status of the electricity sector in LAC and allowed for a more meaningful comparison of utility performance across and within LAC countries. A broad audience used the database including electricity distribution utilities, World Bank TTLs, PH. D students, and government officials. For instance, the Government of India requested and was granted access to use the database to benchmark Indian electricity utilities.</p>	

## South Asia Region

<b>ESMAP ACTIVITY: ADDRESSING INDOOR AIR POLLUTION (P083898)</b> <b>FISCAL YEAR: 2008</b> <b>COUNTRY: BANGLADESH</b>	
<b>OUTCOME: KNOWLEDGE INCREASED</b>	<b>INDICATOR: FACILITATED EXCHANGE OF BEST PRACTICES WITH CLIENTS</b>
<p>This ESMAP-supported study reviewed ongoing household energy programs in Bangladesh and international experiences on improved stoves; drew lessons from successful interventions in the sanitation sector; and offered recommendations for developing a large-scale improved cook stoves program in Bangladesh. The study's findings were disseminated at two workshops attended by government officials, practitioners, entrepreneurs, and representatives of donors and NGOs. The findings were used as part of the development of a household energy program in Bangladesh.</p>	
<b>ESMAP ACTIVITY: ASSESSING THE SOCIAL IMPACTS OF RURAL ENERGY (P111242)</b> <b>FISCAL YEAR: 2008</b> <b>COUNTRY: NEPAL</b>	
<b>OUTCOME: CLIENT CAPACITY INCREASED</b>	<b>INDICATOR: MONITORING AND EVALUATION CAPACITY STRENGTHENED</b>
<p>Prior to the ESMAP-supported activity, the Nepalese Alternative Energy Promotion Center (AEPC), the primary institution dedicated to develop and promote renewable and alternative energy technologies, was facing growing pressure to demonstrate results of its renewable energy program funded by various multilateral and bilateral agencies. ESMAP supported the AEPC to develop a web-based monitoring and evaluation system and train the AEPC's M&amp;E cell on how to use the system. The developed M&amp;E system helps the AEPC to report program's outputs and impacts on households and businesses and to make informed decisions as well as devise appropriate solutions. At the activity completion, AEPC was equipped with not only a state-of-the-art monitoring system to track progress and demonstrate the impacts of its programs but also with trained staff who can sustainably manage and update the system, as required.</p>	

ESMAP ACTIVITY: WORK ON GENDER AND YOUTH IN EI (P104135) FISCAL YEAR: 2008			
OUTCOME: DEVELOPMENT FINANCING INFORMED		INDICATOR: PREPARATION OF EXISTING AND NEW OPERATION INFORMED	
OUTCOME: POLICY/STRATEGY INFORMED		INDICATOR: BANK COUNTRY STRATEGY INFORMED	
<p>ESMAP's grant contributed partially to implement the Gender and Extractive Industries Program of the World Bank's Oil and Mining Unit (SEGOM). The grant supported the publication of key analytical and operational products including: (i) <i>Gender-Sensitive Approaches for the Extractive Industry in Peru</i>, (ii) <i>Gender dimensions of the Extractive Industries</i>, and (iii) <i>Mainstreaming Gender into Extractive Industries Projects - Guidance Note for TTLs</i>. The <i>Guidance Note</i> provides a consistent and structured approach to identifying gender-sensitive activities during project design and preparation.</p> <p>The guidance note has influenced the design of gender-sensitive activities for mining projects approved since FY08 including the following four projects:</p> <ol style="list-style-type: none"> <li><b>Papua New Guinea – Second Mining Sector Institutional Strengthening TA:</b> The project's component 2 will build capacity of a women technical group to implement the National Women-in-Mining Action Plan in collaboration with the Mineral Resources Authority.</li> <li><b>Tanzania - Sustainable Management of Mineral Resources:</b> Gender-sensitive activities are included in two sub-components: (i) Extension Services for Artisanal and Small-scale Mining communities and (ii) Environmental and Social Management.</li> <li><b>Mongolia – Mining Sector Technical Assistance Project:</b> The project supports gender-sensitive reforms in the mining sector to protect women from discrimination and promote employment equity.</li> <li><b>Democratic Republic of Congo -Growth with Governance in the Mineral Sector:</b> The project includes activities to facilitate gender inclusion in mining benefit sharing and to pilot innovative approaches to gender and child labor issues under component D.</li> </ol> <p>In Papua New Guinea (PNG), the work on gender and extractive industries, supported by ESMAP, influenced the development of a national, women-in-mining action plan. The development of this plan was well received and appreciated by several stakeholders. It resulted in the 2008-11 country assistance strategy indicating that gender is one the two cross-cutting themes of World Bank's PNG portfolio. The strategy also mentions that the World Bank will support the implementation of the women-in mining action plan to improve the positive impacts of mining, while reducing the negative impacts of extractive industries operations on women, children and youth.</p>			
<i>WB Lending Operation Informed</i>	<i>Project ID</i>	<i>Approval FY</i>	<i>Amount (US\$)</i>
<i>Papua New Guinea - Second Mining Sector Institutional Strengthening TA</i>	<i>P102396</i>	<i>FY2008</i>	<i>17 WB loan</i>
<i>Tanzania - Sustainable Management of Mineral Resources</i>	<i>P096302</i>	<i>FY2009</i>	<i>50 WB loan</i>
<i>Mongolia – Mining Sector Technical Assistance Project</i>	<i>P108768</i>	<i>FY2008</i>	<i>9.3 WB loan</i>
<i>Democratic Republic of Congo - Growth with Governance in the Mineral Sector</i>	<i>P106982</i>	<i>FY2011</i>	<i>50 WB loan</i>

ESMAP ACTIVITY: GENDER AND ENERGY (P109952)	
FISCAL YEAR: 2008	
COUNTRY / REGION: GLOBAL	
OUTCOME: POLICY/STRATEGY INFORMED	INDICATOR: BANK SECTOR STRATEGY INFORMED/INFLUENCED
<p>ESMAP organized a 2-day horizon scanning and planning workshop in May 2008 comprised of World Bank energy task team leaders. The key findings and recommendations of that workshop and preparatory analysis led to the <b>Gender and Energy Development Strategies (GEDS) Program</b>, which is a key component of the Business Plan FY08-13. Namely stating that the Task Teams want "just in time assistance" and need greater support on the evidence and approaches of integrating gender into ongoing and future operations. This now forms the basis of the Gender and Energy program which aims to develop traction on the ground by contributing to the on-going programs and enhancing client capacity through the i) <i>regional</i> ii) <i>thematic</i>, and iii) <i>knowledge sharing and outreach activities</i>.</p>	

<b>ESMAP ACTIVITY:</b> <ul style="list-style-type: none"> <li>▪ P123004 - GENDER &amp; ENERGY AND DEVELOPMENT STRATEGIES PROGRAM</li> <li>▪ P116908 - 3A: GENDER AND ENERGY</li> </ul>															
FISCAL YEAR: 2011 (P123004), 2010 (P116908) (FUNDED BY AFREA AND ESMAP)															
OUTCOME: DEVELOPMENT FINANCING INFORMED	<b>INDICATOR:</b> <ul style="list-style-type: none"> <li>• PREPARATION OF EXISTING AND NEW OPERATIONS INFORMED</li> <li>• MOBILIZATION OF NON-BANK RESOURCES INFORMED</li> </ul>														
OUTCOME: CLIENT CAPACITY INCREASED	<b>INDICATOR: IMPLEMENTATION CAPACITY STRENGTHENED</b>														
<p>In <b>Senegal</b>, the joint AFREA-ESMAP Gender &amp; Energy team assisted the World Bank team preparing the second phase of the Senegal - Second Sustainable and Participatory Energy Management project (PROGEDE I) in drawing the lessons learned from the first phase of the project and recommending future gender-sensitive activities. The recommended activities were included in the design of the project's second phase (PROGEDE II), which is financed by the World Bank. The project development objective explicitly states gender equality: "<i>the project development objective is to contribute to increase the availability of diversified household fuels in a sustainable and <u>gender equitable</u> way, and to contribute to increase the income of participating communities while preserving the forest ecosystems.</i>"</p> <p>In <b>Mali</b>, the Gender &amp; Energy operational support resulted in the Household Energy and Rural Electrification Agency (AMADER) formally establishing a gender desk within its organizational structure to better mainstream gender in its operations. The AFREA/ESMAP-funded Africa Gender &amp; Energy program has been assisting AMADER in assessing the gender dimensions of the World Bank-financed Household Energy &amp; Universal Access Project, and in preparing an action plan. The assistance resulted in the inclusion of gender impact assessment in the additional financing for the Household Energy and Universal Access Project.</p> <p>Besides ESMAP influence in the additional financing, the action plan, prepared under the gender &amp; energy program, identified gender-sensitive activities and some of those activities have been included in an investment plan prepared for funding by the Scaling up Renewable Energy Program (SREP), one of the financing windows under the Climate Investment Funds.</p>															
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Other investment informed: SREP investment plan in Mali (\$40 M)															
Impacts of WB loan influenced by ESMAP															
Mali:															
<ul style="list-style-type: none"> <li>• 18,525 households and a total of 416 schools, health centers, and other municipal institutions connected to electricity in Mali</li> </ul>															

- 408,755 improved cookstoves purchased by households
- 16 new private operators providing electricity in rural areas

**ESMAP ACTIVITY:** GENDER & ENERGY DEVELOPMENT (P119673)

**FISCAL YEAR:** 2010

**COUNTRY / REGION:** GLOBAL

**OUTCOME:** CLIENT CAPACITY INCREASED

**INDICATOR:** IMPLEMENTATION CAPACITY STRENGTHENED

The activities, implemented in partnership with SDV, involved a number of knowledge exchange events, including a three-day workshop on Energy and Gender for South Asia, which was attended by World Bank energy staff and over 50 government officials from Bangladesh, India, Pakistan, Nepal, and Sri Lanka. During the workshop, government officials developed gender action plans for mainstreaming gender in their respective energy portfolios. 86% of the workshop participants rated the usefulness of the information provided good to excellent.

**ESMAP ACTIVITY:** MODERNIZING ENERGY SERVICES FOR THE POOR (P112370)

**FISCAL YEAR:** 2008

**OUTCOME:** POLICY/STRATEGY INFORMED

**INDICATOR:** BANK SECTOR STRATEGY INFORMED

To support the World Bank's efforts to scale up access to modern energy, ESMAP reviewed over 500 World Bank energy access-related projects approved between the fiscal years 2000 and 2008. The review, published in December 2010, found that only about 1 percent of the energy lending was dedicated to promote transition to more modern cooking fuels, a strong signal that more needs to be done in the household energy sub-sector (biomass energy and cooking fuels). The review's findings provided the analytical basis for two subsequent papers: (1) an "issues and approach" paper issued by AFTEG and (2) "*Household Energy Access for Cooking and Heating: Lessons Learned and Way Forward*", a background paper to the World Bank Energy Strategy. It provided the rationale for a renewed World Bank engagement in the household energy sector.

**ESMAP ACTIVITY:** HOUSEHOLD ENERGY PAPER – LESSONS LEARNED (P121383)

**FISCAL YEAR:** 2010

**OUTCOME:** POLICY/STRATEGY INFORMED

**INDICATOR:** BANK SECTOR STRATEGY INFORMED

ESMAP-supported study released a report entitled *Household Energy Access for Cooking and Heating: Lessons Learned and Way Forward*. The report reviews experiences from World Bank's projects and programs as well as from governments and bilateral organizations; draws lessons learned; and proposes what the World Bank and partners can do to scale-up access to sustainable and cleaner cooking fuels and stoves. The report stimulated debate on how the World Bank can help mainstream household energy in its lending. It contributed to the inclusion of "household energy" as a key business line within the fiscal year 2012 work program of the World Bank's Sustainable Energy Department.

### Energy Access Activities with Limited or Unobserved Results

Of the 55 completed activities that were reviewed, the desk assessment could not easily track impacts for 5 completed activities. One activity is still under dissemination. Another one led to the recommendation to hold back follow-up interventions because of the premature context. The remaining four activities have little information on impacts. Details are provided below.

**ESMAP ACTIVITY:** DECISION TOOL - PV FOR COMMUNITY SERVICE (P118980)

**FISCAL YEAR:** 2010

**COUNTRY / REGION:** AFRICA

The activity developed a decision toolkit to facilitate an effective design and implementation of off-grid solar PV projects to power households, health clinics, schools, and low-lift water pumps. The toolkit was presented at a workshop organized by the Africa Electrification Initiative in November 2011 in Dakar, Senegal. It will be disseminated at AEI future workshops. Since the activity is still under dissemination, it is too early to observe major impacts.



**ESMAP ACTIVITY:** ECONOMICS OF CONNECTING THE POOR TO NATURAL GAS (P111466)

**FISCAL YEAR:** 2009

**COUNTRY / REGION:** SOUTH EASTERN EUROPE / EUROPE AND CENTRAL ASIA

ESMAP supported a study on the economic and financial viability of connecting poor and low income households to natural gas in Serbia, Bosnia & Herzegovina, and Macedonia. The study highlighted barriers and options for connecting vulnerable groups to natural gas. Information on impacts was not found.

**ESMAP ACTIVITY:** IDENTIFYING TRADITIONAL AND NON-TRADITIONAL MECHANISMS FOR REACHING THE POOR IN INFRASTRUCTURE SERVICES (P110667)

**FISCAL YEAR:** 2008

**COUNTRY / REGION:** LATIN AMERICA AND CARIBBEAN

The study report documented traditional and non-traditional mechanisms for enabling access to affordable infrastructure services. The report contains case studies and lessons learned from experiences where selected mechanisms were used at a community, utility, and country level. It provides information to clients seeking to expand the coverage of infrastructure coverage. Information on impacts was not found.

**ESMAP ACTIVITY:** EVALUATION OF RURAL ELECTRIFICATION (P111450)

**FISCAL YEAR:** 2008

**COUNTRY / REGION:** GLOBAL

The activity involved supporting the World Bank energy project teams in Bangladesh, Nepal, Kenya, and Peru to monitor and evaluate the impacts of their projects. The activity team trained and advised the Bangladeshi Rural Electrification Board and the Nepalese AEPC on M&E development and impact evaluation. It further assessed impacts of rural electrification projects in Bangladesh, studied welfare impacts of micro-hydro projects in Nepal, and conducted a feasibility study for impacts evaluation in Kenya. Information on the impacts of the activity was not found.

**ESMAP ACTIVITY:** ECONOMIC BENEFITS OF ELECTRICITY SUPPLY (P116227)

**FISCAL YEAR:** 2009

**COUNTRY / REGION:** GLOBAL

The activity studied the economic benefits associated with improved access to electricity. The study offered policy recommendations for preparing electricity access investments and pointed out the methodology limitations of using consumer surplus to measure economic benefits of electricity access. It suggested better understanding the drivers for energy demand to improve design of electrification investments. Information on impacts was not found.

### Ongoing Energy Access Activities

**ESMAP ACTIVITY:** IDENTIFICATION AND TESTING OF INPUTS FOR ENHANCED ELECTRICITY ACCESS PACKAGE (P100860)

**FISCAL YEAR:** 2009

**COUNTRY / REGION:** AFRICA (FUNDED BY AFREA)

The activity assessed the impacts of rural electrification on productive uses of electricity in selected villages in Benin, Nigeria, and Uganda. The assessment was conducted in close collaboration with GTZ, who provided funding and expertise. A preliminary draft report was prepared, peer-reviewed and is being revised. The next steps involve the report publication.

**ESMAP ACTIVITY:** ENHANCING THE CLIMATE RESILIENCE OF GROWTH (P117818)

**FISCAL YEAR:** 2010

**COUNTRY / REGION:** NIGERIA / AFRICA (FUNDED BY AFREA)

The activity will identify low-carbon development options in Nigeria's energy sector, evaluate their economic feasibility, estimate the financial and institutional needs to implement the low-carbon options, and strengthen capacities on low-carbon planning. The activity is still ongoing.



**ESMAP ACTIVITY:** HOUSEHOLD ENERGY & UNIVERSAL ACCESS (P073036)

**FISCAL YEAR:** 2011

**COUNTRY / REGION:** MALI / AFRICA (FUNDED BY AFREA)

The activity will strengthen energy services delivery schemes in rural and peri-urban areas in Mali as part of Component 2 of the Household Energy and Universal Access (HEURA) Project. Within the HEURA project, AFREA funds are earmarked to promote the wider use of clean, renewable energy technologies in off-grid electrification schemes managed by local private energy service companies under the supervision of Mali's Household Energy and Rural Energy Service Agency, AMADER. Implementation of the grant-funded activities started in August 2011.

**ESMAP ACTIVITY:** CATALYZING NEW RENEWABLE ENERGY IN RURAL LIBERIA (PHASE2) (P118439)

**FISCAL YEAR:** 2011

**COUNTRY / REGION:** LIBERIA / AFRICA (FUNDED BY AFREA)

The activity constitutes the second phase of the AFREA grant that resulted in the establishment of the Rural Renewable Energy Agency in Liberia. The grant agreement launching the activity was signed on March 15, 2011 and implementation is ongoing.

**ESMAP ACTIVITY:** MODERNIZING BIOMASS ENERGY SERVICES IN BENIN (P110075)

**FISCAL YEAR:** 2012

**COUNTRY / REGION:** BENIN / AFRICA (FUNDED BY AFREA)

The activity complements the biomass component of the World Bank-financed Increased Access to Modern Energy Project in Benin. Its objective is to increase access to cleaner cooking stoves, support the efficiency of biomass use, and promote non-wood income generating activities. It is too early to observe the activity outcomes. The activity's implementation began on November 09, 2011, when the grant agreement was signed. It is ongoing.

**ESMAP ACTIVITY:** DIRECT DELIVERY OF POWER SUBSIDY (P122107)

**FISCAL YEAR:** 2010

**COUNTRY / REGION:** INDIA / SOUTH ASIA

This ESMAP-supported study seeks to assess opportunities to introduce an alternative system for delivering power and subsidy to farmers in India. The study is ongoing.

**ESMAP ACTIVITY:** ESMED ENERGY ACCESS FOR URBAN POOR - CA (P120447)

**FISCAL YEAR:** 2010

**COUNTRY / REGION:** GLOBAL

This activity is a programmatic initiative to develop a work plan to address limited access to modern energy services by slum dwellers and peri-urban populations. The activity's first phase studied energy access issues in three slums in Ghana and prepared eight case studies documenting innovative approaches to increasing access to electricity and cooking fuels for slums in Bangladesh, India, Brazil and Colombia. The second phase is organizing online and face-to-face consultations to develop an action plan.

**ESMAP ACTIVITY:** REVIEW OF STRATEGIES FOR SUSTAINABLE PRODUCTION OF COMMERCIAL FUEL WOOD (P114371)

**FISCAL YEAR:** 2009

**COUNTRY / REGION:** GLOBAL

The activity compiled best practices from community-based, forest management approaches that involved small and medium enterprises. A draft report was prepared and is being edited for publication.

### 3. ENERGY EFFICIENCY

#### Africa Region

<b>ESMAP ACTIVITY:</b> LEDS LIGHTS QUICK SCREENING METHODOLOGY (P113599) <b>FISCAL YEAR:</b> 2009 <b>COUNTRY:</b> REGIONAL	
<b>OUTCOME:</b> INNOVATIVE APPROACHES & SOLUTIONS GENERATED	<b>INDICATORS:</b> <ul style="list-style-type: none"> <li>NEW INNOVATIVE APPROACHED DEVELOPED</li> <li>CLIENT IS ABLE TO ADOPT NEW TECHNOLOGIES, INNOVATIVE IDEAS, OR KNOW-HOW</li> </ul>
<p>This activity, supported under the Lighting Africa program, helped develop a new low-cost testing methodology of high quality white Light Emitting Diode (LED) products that can provide efficient, clean and cost-effective lighting in off-grid facilities. The methodology has been used for testing over 30 products and is considered now one of the most accepted methodologies for testing small off-grid lighting products for developing countries.</p> <p>The new testing off-grid lighting testing methodology developed has been made publicly available through the Lighting Africa website. The program is now transferring the methodology to laboratories throughout Sub-Saharan Africa. The testing capacity already exists in three laboratories and is under development in a fourth. Building capacity in local labs helps ensure sustainability of the results.</p>	

#### East Asia and Pacific Region

<b>ESMAP ACTIVITY:</b> CHINA ENERGY INTENSITY REDUCTION STRATEGY (P099544) <b>FISCAL YEAR:</b> 2009 <b>COUNTRY:</b> CHINA			
<p>This ESMAP activity targeted the review of key energy efficiency policies, regulations and standards, and proposed strategies to the Government of China on how to streamline the institutional framework and update related policies and regulations in line with changing national and international economic environments. The activity produced three separate policy notes targeting three specific outcomes:</p>			
<b>OUTCOME:</b> POLICY STRATEGY INFORMED	<b>INDICATOR:</b> GOVERNMENT POLICY INFORMED		
<p>The <i>first policy note</i> conducted a re-evaluation of China's renewable energy targets, growth paths, and related policy issues, taking into account full-cost pricing. The study created a new stand-alone model to optimize across various renewable energy options in a growing energy sector with full-cost pricing (i.e., incorporating both financial and environmental costs). The note helped the Government's refine its renewable energy development targets in its formulation of the newly announced 12th Five Year plan.</p>			
<b>OUTCOME:</b> CLIENT CAPACITY INCREASED	<b>INDICATOR:</b> DESIGN CAPACITY STRENGTHENED		
<p>The <i>second policy note</i> made an analysis of coal and emissions savings when power dispatch across a province-wide grid is managed to maximize efficiency rather than minimize costs. The study made a strong contribution to the client's ability to independently analyze the impact of the Dispatch for Energy Saving and Emission Reduction in Power Generation as it scaled up the five initial pilot efforts (three of which were analyzed in this policy note).</p>			
<b>OUTCOME:</b> DEVELOPING FINANCING INFORMED	<b>INDICATOR:</b> PREPARATION OF NEW OPERATION INFORMED		
<p>The <i>third policy note</i> conducted an evaluation of energy efficiency investment potential related to phasing out inefficient cement plants, including social safety net issues related to job layoffs. The note, which was done based on the Shandong Province, directly informed the preparation of the Shandong Energy Efficiency Project, which finances industrial energy efficiency, including the cement sector.</p>			
<b>WB Lending Operation Informed</b>	<b>Project ID</b>	<b>Approval FY</b>	<b>Amount (US\$)</b>
<i>Shandong Energy Efficiency</i>	<i>P114069</i>	<i>FY2011</i>	<i>\$150 M WB loan</i>

**ESMAP ACTIVITY: SURVEY AND KNOWLEDGE SHARING ON ENERGY CONSERVATION IN CHINA'S PROVINCES (P111927)**

**FISCAL YEAR: 2009**

**COUNTRY: CHINA**

**OUTCOME: DEVELOPMENT FINANCING INFORMED**

**INDICATOR: PREPARATION OF NEW OPERATION INFORMED**

The ESMAP study surveyed China's provincial EE programs and summarized lessons learned for provinces to improve design and implementation of future programs. Following up and drawing upon the ESMAP report, additional resources from the Australian Agency for International Development (AusAID) and World Bank were mobilized for the in-depth study "Accelerating Energy Conservation in China's Provinces" (June 2010).

Together, these efforts paved the way for a new support platform for provincial-level energy conservation programs through three lending operations: A GEF grant of \$13 million for the *Provincial Energy Efficiency Scale-Up Project* to support new innovations and capacity building in Shanxi, Shandong and Jiangxi Provinces; and a \$150 million World Bank loan for the *Shandong Province Energy Efficiency Project*<sup>25</sup>, to support improvement of energy efficiency in selected enterprises in the Shandong Province, particularly through financial leasing arrangements, and increased use of biomass for power and heat generation.

There is also a proposed *Shanxi Province Energy Efficiency (P113787)* Bank loan of about \$300 million to support demonstrating good energy efficiency practice in the key energy transformation process and industrial energy consumption processes. The project is scheduled for Bank approval for October 2012 (FY2013).

WB Lending Operation Informed	Project ID	Approval FY	Amount (US\$)
<i>GEF - Provincial Energy Efficiency Scale-up Program</i>	<i>P114182</i>	<i>2011</i>	<i>\$13.4 M (GEF)</i>
<i>Shandong Province Energy Efficiency</i>	<i>P114069</i>	<i>2011</i>	<i>\$150 M WB loan</i>

**ESMAP ACTIVITY: RESILIENT CITIES: DECISION SUPPORT TOOLS FOR CLIMATE AND DISASTER RISK REDUCTION IN EAST ASIAN CITIES (P121572)**

**FISCAL YEAR: 2010**

**COUNTRY: REGIONAL**

**OUTCOME: DEVELOPMENT FINANCING INFORMED**

**INDICATOR: MOBILIZATION OF NON-BANK RESOURCES INFORMED**

This activity, partially funded by ESMAP, helped to develop tools for identifying and operationalizing disaster risk mitigation and climate adaptation measures at the city level. Under the activity, two key outputs were delivered:

1. Workbook on Developing Local Resilience Action Plans - a guide on assessing risks and vulnerabilities, identifying and prioritizing disaster risk mitigation measures, and decision support tools on adopting an implementation strategy;
2. A multi-hazard City Risk Index - a standardized metric to capture aggregate risk at the city level to establish a baseline and measure performance over time and relative to peers.

As part of refining the methodology for the index, three city pilots were undertaken and completed in the cities of Ningbo, Manila, and Bangkok. This has immediately led to interest and downstream work in Manila for the design of a barangay-level (neighborhood) risk index that can function as a damage assessment tool, an emergency response tool and a land-use planning and investment decision support mechanism. Funding of about **US\$ 450,000** has been secured from AusAID to support this initiative.

<sup>25</sup> ESMAP activity P09954 - China Energy Intensity Strategy (P099544) also influenced this lending operation.

## Europe and Central Asia Region

<b>ESMAP ACTIVITY:</b> DISTRICT HEATING AND ELECTRICITY RESTRUCTURING (P113570) <b>FISCAL YEAR:</b> 2009 <b>COUNTRY:</b> MOLDOVA	
<b>OUTCOME:</b> POLICY/STRATEGY INFORMED	<b>INDICATOR:</b> GOVERNMENT POLICY/STRATEGY INFORMED
<p>The ESMAP activity informed Moldova's regulatory framework for district heating. As a result of the implementation of the recommendations of the policy note, the energy regulator (ANRE) has full tariff setting authority for District Heating tariffs in the capital city of Chisinau. Key results included:</p> <ol style="list-style-type: none"> <li>1. The GoM agreed to the need for reforms and issued a law on December 2009 to transfer full district heating tariff setting authority to the independent energy regulator ANRE,</li> <li>2. In January 2010, the regulator increased the heating tariffs for the 2009/2010 heating season by 30%. It is estimated that the current tariff covers all cash costs,</li> <li>3. The Bank energy team took a leading role in the DH sector policy dialogue between the GoM and the country's developing partners. The Bank team provided the sector expert support in the IMF Stand-by-Arrangement.</li> </ol>	

## Latin America and Caribbean

<b>ESMAP ACTIVITY:</b> SUPPORT FOR DEVELOPMENT OF NATIONAL ENERGY EFFICIENCY PROGRAM (P112532) <b>FISCAL YEAR:</b> 2009 <b>COUNTRY:</b> CHILE	
<b>OUTCOME:</b> CLIENT CAPACITY INCREASED	<b>INDICATOR:</b> IMPLEMENTATION CAPACITY STRENGTHENED
<p>In response to the Chilean Government's request, ESMAP provided this technical assistance to assess energy efficiency at municipal level and build capacity of both national and municipal institutions in implementing energy efficiency programs. Based on the findings of the assessment conducted, an interactive website for e-learning in energy efficiency was set up (and remains operational) and training was delivered to 11 municipal agents<sup>26</sup>. The activity provided specific material specially designed for training and strengthening capacities in municipal agents in the Chilean context.</p> <p>The major earthquake that affected Chile in early 2010 had an impact on the project as other issues and needs emerged for the municipalities (e.g. housing, water availability) and Energy Efficiency lost relevance. However, the activity allowed Chilean authorities to better understand energy consumption at municipal level, the type of issues faced by Municipalities when it comes to energy use and the resources they have to deal with such issues.</p>	

## Middle East and North Africa Region

<b>ESMAP ACTIVITY :</b> SUPPORT TO IMPLEMENTATION OF ELECTRICITY SECTOR (P113858) <b>FISCAL YEAR:</b> 2009 <b>COUNTRY:</b> LEBANON	
<b>OUTCOMES:</b> POLICY/STRATEGY INFORMED	<b>INDICATOR:</b> GOVERNMENT POLICY/ STRATEGY INFORMED
<p>The ESMAP activity comprised two separated assessments for Lebanon's energy sector. The first assessment determined the availability of LNG supply to Lebanon from LNG markets and assessed supply risks associated with these markets highlighting the potential development of LNG as an alternate supply of natural gas for Lebanon. The second one assessed the government's current Energy Efficiency initiatives and proposed an Energy Efficiency action plan aimed at a short to medium term increase in the benefits that can be derived from Energy Efficiency measures that can be pursued by Ministry of Energy and Water in the current political environment.</p>	

<sup>26</sup> Only 11 of the 30 enabled municipal agents took the training through E-learning platform due to, to some extent, the earthquake that affected Chile in early 2010.

Based on the recommendations made by the two assessments (LNG and EE) the government included plans for LNG re-gasification development in its Policy Paper for the Electricity Sector (June 2010), and is now undertaking additional study into the size, location and financing arrangements for LNG facilities and supply contracts for Lebanon. The government has also included Energy Efficiency programs in the above policy paper and is now setting aside budgetary allocations to implement a number of energy efficiency programs including roll-out of solar water heaters, and introduction of thermal building standards.

**ESMAP ACTIVITY:** TRANSPORT AND CLIMATE CHANGE PROJECT (P101264)

**FISCAL YEAR:** 2009

**COUNTRY:** MOROCCO

**OUTCOME:** POLICY/STRATEGY INFORMED

**INDICATOR:** BANK COUNTRY STRATEGY (CPS/CAS)

**OUTCOME:** DEVELOPING FINANCING INFORMED

**INDICATOR:** PREPARATION OF NEW OPERATION INFORMED

The ESMAP activity helped prepare an overview of energy use in the road transport sector, assess efficiency of use, and identify main issues and recommend actions to be taken by government. It also reviewed issues of adaptation to climate change in the transport sector with preparation of recommendations for priority measures to be taken.

ESMAP support through the Transport and Climate Change project has prepared the ground for a new Bank strategy for Morocco's transport sector. The study assessed of the current state of the sector and identified options to improve vehicle efficiency and reduce GHG emissions. Examples include improvements in the performance and quality of public transport; transport demand management measures; traffic management and the promotion of non-motorized modes of transport (e.g. walking and cycling). The Bank's new Country Partnership Strategy (FY10-13) provides support to Morocco to improve the efficiency of urban transport in the country's large cities.

The activity provided analytical inputs to the *Urban Transport Development Policy Loan* (DPL) (US\$ 137 million) approved in March 2011. The most important were the following:

- Systematically carrying out vulnerability assessments of major transport infrastructure to take account of changes in the conditions under which they operate in case of major rain and flooding and design remedial measures.
- Review construction norms and standards to adapt them to new weather patterns.
- Develop a specific institutional capability for adaptation within the Ministry of Transport.

The loan was aimed at (a) reducing transport costs and improves the mobility of people and goods; (b) improving the quality and efficiency of urban transport services; and (c) mitigating greenhouse gas emissions.

WB Lending Operation Informed	Project ID	Approval FY	Amount (US\$)
<i>Morocco- Urban Transport Development Policy Loan</i>	<i>P115659</i>	<i>2011</i>	<i>\$137 M WB loan</i>

**ESMAP ACTIVITY :** INSTITUTIONAL FRAMEWORK FOR ENERGY EFFICIENCY PROGRAM IMPLEMENTATION (P114431)

**FISCAL YEAR:** 2009

**COUNTRY:** YEMEN

**OUTCOMES:** POLICY/STRATEGY INFORMED

**INDICATOR:** GOVERNMENT POLICY/STRATEGY INFORMED

The ESMAP activity developed a three-year DSM/EE action plan in June 2009, which helped the government to lay the foundation for a sustainable program and build implementation capacity. The report outlined the institutional structures for an effective implementation of DSM/EE measures in Yemen; the proposed structure was a DSM/EE authority under the Ministry of Electricity and Energy with a steering committee of key stakeholders to develop policy and monitor impact of programs initiated by the proposed authority.

Based on the findings and recommendations, the Government developed and approved in June 2009 the national strategy for RE & EE which sets out the broad strategy to achieve specific targets to achieve it (15% increase of EE in the power sector by 2025).

## South Asia Region

<b>ESMAP ACTIVITY: ENERGY EFFICIENCY AND CLEANER TECHNOLOGY IN BRICK MAKING IN BANGLADESH (P111240)</b>			
FISCAL YEAR: 2009			
COUNTRY: BANGLADESH			
<b>OUTCOME:</b> DEVELOPMENT FINANCING INFORMED		<b>INDICATOR:</b> NEW OPERATIONS INFORMED	
<b>OUTCOME:</b> POLICY/STRATEGY INFORMED		<b>INDICATOR:</b> GOVERNMENT POLICY/STRATEGY INFORMED	
<b>OUTCOME:</b> INNOVATIVE APPROACHES & SOLUTIONS GENERATED		<b>INDICATOR:</b> NEW INNOVATIVE APPROACHED DEVELOPED/FOSTERED	
<p>This ESMAP study estimated the private and social profitability of selected brick technologies and to provide concrete recommendations for their adoption in Bangladesh. Under the activity, ESMAP partially financed the demonstration projects comprising (i) introducing internal fuel in the green bricks, (ii) introducing semi-mechanized brick making which allow use of internal fuel, (iii) adopting better operating practices in the firing, (iv) improvements in existing designs and (v) introducing alternative technologies such as the Vertical Shaft Brick Kiln (VSBK).</p> <p>The activity informed the brick components of the <i>Clean Air Sustainable Environment (CASE) Project</i> financed by the IDA (P098151, \$62 M). Furthermore, the Asian Development Bank (ABD) has approached the World Bank seeking more technical support on preparation of a new lending project for the brick sector of Bangladesh and possible collaboration with both the Bank and UNDP on the Brick Technology and Information Center in Bangladesh.</p> <p>Partially through the ESMAP study, Bangladesh's Department of Environment (DOE) is now well informed of the huge potential benefit that carbon credits can bring in when switching to cleaner technologies. DOE has already agreed with the World Bank to prepare a potential Carbon Finance project linked with the new energy-efficient kilns to be piloted under CASE to help the entrepreneurs to reap the carbon benefit.</p> <p>Key policy recommendations in the study are being taken into consideration by the Government of Bangladesh to incorporate into the country's new regulatory framework, which includes the establishment of a <i>Brick Information and Technology Center</i> (for which the tender has just recently been launched).</p> <p>In addition, the ESMAP-funded study analyzed the development of the brick industry in China. Through this example, concrete recommendations were made to introduce hollow bricks and alternative raw brick materials in 5 HHK and 2 tunnel kilns (funded by CASE).</p> <p>This ESMAP study piloted an innovative energy-efficient, clean technology called <i>Vertical Shaft Brick Kiln (VSBK)</i> for the brick sector in Bangladesh. After successful implementation of the pilot of the study and the demonstration of its environmental and financial benefits, the demand of the new technology has exponentially increased. A recent dissemination workshop of the study in Dhaka (September 2011) attracted attention from the national media, several multilateral development organizations and international agencies. Thanks to the lessons learnt during this pilot, there are currently 7 more VSBK being installed in Bangladesh (through the CASE project).</p>			
<b>WB Lending Operation Informed</b>	<b>Project ID</b>	<b>Approval FY</b>	<b>Amount (US\$)</b>
<i>Clean Air Sustainable Environment (CASE) Project</i>	<i>P098151</i>	<i>2010</i>	<i>\$62 M (IDA)</i>



**ESMAP ACTIVITY: SUPPORT FOR THE DEVELOPMENT OF A LARGE-SCALE EE LIGHTING PROGRAM (P111246)**

**FISCAL YEAR: 2009**

**COUNTRY: PAKISTAN**

**OUTCOME: DEVELOPMENT FINANCING INFORMED**

**INDICATOR: PREPARATION OF EXISTING OPERATION INFORMED**

This ESMAP activity was developed in response to an urgent request to assist the Government and the Pakistan Electric Power Company (PEPCO) in helping develop a detailed design and an implementation plan for a large-scale EE residential lighting (primarily CFLs based) program. The ESMAP activity provided the basis and directly informed the energy efficiency component of the *Electricity Distribution and Transmission Improvement Program Project*, a \$267M Adaptation Policy Loan (APL) for Pakistan approved in late June 2008. The energy efficiency component on the loan was added at the request of the government prior to negotiations. The Bank agreed to include this new component to proactively respond to the government's request given that such investment is a high priority in view of the deterioration in the power demand supply balance.

Key objectives of the loan included inter alia, (i) the replacement of incandescent bulbs with compact fluorescent lamps (CFLs) at customer premises, (ii) the provision of low-tension capacitors to selected industrial and tube-well customers, and (iii) the provision of pre-paid metering, automatic meter reading and remote metering systems for selected residential and commercial customers.

WB Lending Operation Informed	Project ID	Approval FY	Amount (US\$)
<i>Electricity Distribution and Transmission Improvement Program Project</i>	<i>P095982</i>	<i>FY2008</i>	<i>\$267M WB loan</i>

## Global

**ESMAP ACTIVITY: MAINSTREAMING BUILDING ENERGY EFFICIENCY CODES IN DEVELOPING COUNTRIES (P114056)**

**FISCAL YEAR: 2009**

**COUNTRY: GLOBAL**

**OUTCOME: DEVELOPMENT FINANCING INFORMED**

**INDICATORS: PREPARATION OF NEW OPERATION INFORMED**

The analytical work, conducted under ESMAP's EECl, developed a Methodology for Programmatic Approach to Building Energy Efficiency Code Compliance in Cities of Developing Countries. The study developed a Methodology for Programmatic Approach to BEECs in Cities of Developing Countries.

The recent *GEF Tianjin Eco-city Project* has incorporated lessons learned from this work in its project design document. The report also informed the task team of the *Poland Energy Efficiency Development Policy Loan Project* about the status of the Energy Performance of Buildings Directive of the European Union for their engagement with the client. The project was approved in June 2011 and included support for development of tighter building energy codes. Currently, EECl is collaborating with WB regions, IFC and the International Energy Agency (IEA) on mainstreaming building EE codes.

WB Lending Operation Informed	Project ID	Approval FY	Amount (US\$)
<i>GEF Tianjin Eco-city Project</i>	<i>P098915</i>	<i>FY2011</i>	<i>\$6 M (GEF)</i>
<i>Poland - Energy Efficiency Development Policy Loan</i>	<i>P115426</i>	<i>FY2011</i>	<i>\$114 M WB loan</i>



<b>ESMAP ACTIVITY : ENERGY EFFICIENT CITIES PRACTITIONERS WORKSHOP (P114245)</b>	
FISCAL YEAR: 2009	
COUNTRY: GLOBAL	
<b>OUTCOME: POLICY/STRATEGY INFORMED</b>	<b>INDICATOR: BANK SECTOR STRATEGY INFORMED</b>
<p>In October 2008 and based on the feedback from the workshop's roundtable of energy efficient practitioners along with discussions with World Bank urban staff and several potential global partners, ESMAP launched the five-year <b>Energy Efficient Cities Initiative (EECI)</b> to promote energy-efficient programs and planning among cities in developing countries. The workshop was co-hosted with the World Bank's Urban Anchor, where client cities and potential partners shared examples of their energy efficiency activities, and of what work was still needed.</p> <p>The 5-year EECI plan was developed and presented in December 2008 at the ICLEI Local Government Climate Session side event at COP-14 in Poznan, Poland with the objective to help mainstream and scale-up sustainable energy actions (such as EE) and climate change mitigation considerations in the urban context. Since implementation, a comprehensive program has been successfully developed to include upstream, operational and evaluation support while disseminating tools, experiences, and results to city clients and other interested organizations.</p>	

<b>ESMAP ACTIVITY: OPERATIONAL TOOLKIT FOR ENERGY EFFICIENCY LIGHTING (CFL TOOLKIT) (P114361)</b>													
FISCAL YEAR: 2009													
COUNTRY: GLOBAL													
<b>OUTCOME: INNOVATIVE APPROACHES &amp; SOLUTIONS GENERATED</b>	<b>INDICATOR: NEW INNOVATIVE APPROACHED DEVELOPED/FOSTERED</b>												
<b>OUTCOME: DEVELOPMENT FINANCING INFORMED</b>	<b>INDICATOR: EXISTING OPERATIONS INFORMED</b>												
<p>ESMAP developed the operational toolkit for EE lighting (CFL Toolkit) to help practitioners benefit from experiences in designing and implementing large-scale, residential compact fluorescent lamp (CFL) programs around the world. The toolkit shares the critical operational documents of CFL-based EE lighting programs (e.g., cost-benefit analysis, Terms of Reference and bidding documents), in a user-friendly web-based format.</p> <p>Two recent lending operations have been informed by the CFL Toolkit:</p> <table border="1"> <thead> <tr> <th>WB Lending Operation Informed</th> <th>Project ID</th> <th>Approval FY</th> <th>Amount (US\$)</th> </tr> </thead> <tbody> <tr> <td><i>Mexico EE Lighting and Appliances GEF Project</i></td> <td><i>P106424</i></td> <td><i>FY2011</i></td> <td><i>\$70 M (GEF)</i></td> </tr> <tr> <td><i>Additional financing for the Bangladesh Rural Electrification and Renewable Energy Development (RERED)</i></td> <td><i>P112963</i></td> <td><i>FY2010</i></td> <td><i>\$ 90 M WB loan</i></td> </tr> </tbody> </table> <p>Furthermore, the CFL Toolkit has been used by external partners, such as the UK Department for International Development (DFID) in helping design CFL programs in Malawi. The United Nations Environment Programme (UNEP) has also referred to the Toolkit under their en.lighten initiative announced in Cancun, Mexico in 2010.</p> <p><u>Note:</u> The project was one of the recipients of the <i>2011 Sustainable Development Network (SDN) VPU Team Awards</i> because of its transformational impact in implementing large scale energy efficient lighting programs in several countries around the world by the Bank and by other partners leading to quick and significant energy efficiency gains, changed consumers' behavior, and reduction in GHG emissions.</p>		WB Lending Operation Informed	Project ID	Approval FY	Amount (US\$)	<i>Mexico EE Lighting and Appliances GEF Project</i>	<i>P106424</i>	<i>FY2011</i>	<i>\$70 M (GEF)</i>	<i>Additional financing for the Bangladesh Rural Electrification and Renewable Energy Development (RERED)</i>	<i>P112963</i>	<i>FY2010</i>	<i>\$ 90 M WB loan</i>
WB Lending Operation Informed	Project ID	Approval FY	Amount (US\$)										
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<b>ESMAP ACTIVITY: ENERGY EFFICIENT CITIES SMALL GRANTS (QUEZON CITY) (P115770)</b>	
FISCAL YEAR: 2009	
COUNTRY: PHILIPPINES / EAST ASIA AND PACIFIC	
<p>Under the EE Cities Small Grants, EECI has provided direct technical support to help selected cities identify opportunities for EE improvements. This assistance has been offered to complement the Cities Alliance's grants for preparing city development strategies, as part of EECI's partnership with the Cities Alliance<sup>27</sup>. In this context, grants are provided to cities to finance the implementation of EE pilots in municipal service sectors - water/wastewater,</p>	

<sup>27</sup>The Cities Alliance (<http://www.citiesalliance.org/ca/>) is a global coalition of cities and their development partners committed to scaling up successful approaches to poverty reduction.

power/heating, housing, city lighting, buildings and transport. To this date, grants have been awarded to the cities of Quezon in Philippines and Zarqa in Jordan.

The first technical support, completed in Quezon City, the Philippines in 2010, has enabled city officials to develop an energy efficient buildings program as well as guidance to draft the implementing rules and regulations (IRR) for the Green Building Ordinance that Quezon City had enacted.

**OUTCOME:** CLIENT CAPACITY INCREASED

**INDICATOR:** IMPLEMENTATION CAPACITY STRENGTHENED

Following the completion of this activity, Quezon City has incorporated the recommendations within their 5-year investment plan and established a city energy efficiency task force to coordinate the implementation of the recommendations from this activity. Further, the City has engaged qualified consultants to carry out complementary preparatory activities, including (i) an investment grade energy audit of Quezon City Hall's Main Building and two public hospitals, (ii) training on energy efficiency project design and implementation, and (iii) training on GB ordinance enforcement.

The technical assistance has increased the city's staff capacity. City staff participated in several walk-through energy audits/transport surveys with the consultants in order to get hands-on training on how to identify and assess energy efficiency opportunities. City officials also participated in the stakeholder consultations, which provided an example of how to engage with the private sector, and worked closely with the consultant on developing their plans.

**OUTCOME:** KNOWLEDGE INCREASED

**INDICATOR:** FACILITATED EXCHANGE OF BEST PRACTICES WITH CLIENTS

The activity contributed to substantial knowledge transfer. For Quezon City, the international GB program review provided City staff and other in-country stakeholders (city officials, building owners and managers, private sector construction and finance firms, the Philippines Green Building Council, etc.) with the various approaches that different countries have taken to promote green buildings, lessons learned, incentive mechanisms, results.

**ESMAP ACTIVITY : TOOL FOR RAPID ASSESSMENT OF CITY ENERGY (TRACE) (P115793)**

**FISCAL YEAR:** 2009

**COUNTRY:** GLOBAL

**OUTCOME:** INNOVATIVE APPROACHES & SOLUTIONS GENERATED

**INDICATOR:** NEW INNOVATIVE APPROACHED DEVELOPED/FOSTERED

The city energy diagnostic tool, Tool for Rapid Assessment of City Energy (TRACE, previously named Rapid Assessment Framework) was developed to help cities quickly assess their EE performance, determine underperforming sectors and identify measures the city can take to make improvements and reduce energy cost. TRACE offers better-informed energy efficiency solutions that help reduce escalating energy costs for basic services. As a part of the capacity building exercise, ESMAP provided training for local authorities on how the tool works and what it delivers.

TRACE was developed during two phases:

- Phase I of the project (Design, development and field testing of the beta version of the tool) was completed in September 2010. A field testing of the tool was conducted in Quezon City, Philippines and a final report was prepared based on TRACE results and its field validation.
- Phase II of the project included a pilot testing of the beta version of the tool and its upgrade in the city of Gaziantep, Turkey (November 2010 - March 2011).

TRACE has been implemented in 14 cities in 13 different countries and has had substantial success. For instance in **Turkey**, TRACE informed the creation of the Sustainable Cities pillar in the US\$4.45 billion, 2012-2015 Country Partnership Strategy. In **Indonesia**, the WB used TRACE to conduct city-level case studies. Findings from the case studies are being used to create Energy and Emissions Sustainability Plan (EESP) Guidelines which will be distributed throughout the entire East Asia and the Pacific region. In **Macedonia**, TRACE has fed into the broader Green Growth Agenda, and is helping inform bank-financed Municipal Infrastructure Investment Project. In **Georgia**, TRACE results are contributing to the development of the Georgia's Municipal Development Fund, where a third generation of the fund will consider using a sustainable cities investment framework.

<b>ESMAP ACTIVITY: ENERGY EFFICIENCY GOOD PRACTICE DATABASE (P115771) (ONGOING)</b>	
FISCAL YEAR: 2010	
COUNTRY: GLOBAL	
<b>OUTCOME: KNOWLEDGE INCREASED</b>	<b>INDICATOR: FACILITATED EXCHANGE OF BEST PRACTICES WITH CLIENTS AND PARTNERS / DISSEMINATE BEST PRACTICES</b>
<p>In October 2009, EECI developed and launched a database with good practice energy efficiency case studies from cities around the world and across six urban sectors (transport, buildings, water and waste water, public lighting, solid waste, and power and heat). The <i>Good Practice Database</i>, now with 15 case studies developed by ESMAP and 6 from Eco2, provides detailed documentation on successfully-implemented practices in cities, for other cities facing similar challenges and circumstances in promoting EE. The case studies provide a full story of what the cities did, why they took action, implementation arrangements, cost and benefits, financing, innovations, results and lessons learned.</p> <p>The case studies have been disseminated to city authorities through ESMAP-funded technical assistance, workshops, conferences, analytical work, and other learning events, as well as Bank regional operations staff and a broader audience through ESMAP's website. These outreach efforts have led to increased knowledge of Bank staff, energy practitioners and communities on a range of policy and program options along with implementation details and an objective assessment of results.</p> <p><b>Note:</b> A separate component of the project, the Good Practice Awards, an initiative to invite cities to compete for a in recognition of cities' endeavors in promoting EE, was launched in January 2010 with a call for proposals. However, due to low demand and limited response this component was subsequently dropped.</p>	

<b>ESMAP ACTIVITY: SMART METERS (P118728)</b>			
FISCAL YEAR: 2010			
COUNTRY: GLOBAL			
<b>OUTCOME: INNOVATIVE APPROACHES &amp; SOLUTIONS GENERATED</b>	<b>INDICATOR: NEW INNOVATIVE APPROACHED DEVELOPED/FOSTERED</b>		
<b>OUTCOME: DEVELOPMENT FINANCING INFORMED</b>	<b>INDICATOR: PREPARATION OF NEW OPERATIONS INFORMED</b>		
<p>This ESMAP study illustrates the applicability and options for applying Advanced Metering Infrastructure (AMI) technology to a variety of customer management issues commonly found in public service utilities, in particular in electricity distribution companies. The tool is aimed at Bank operational staff and energy practitioners in client countries by providing updated information on application of AMI technology in electricity distribution as a tool to improve performance of companies, promote energy efficiency and implement social safety nets in client countries.</p> <p>The approach described in the report is explicitly reflected in the design of the advanced metering infrastructure (AMI) components of several Bank projects, most notably the <i>Brazil - Electrobras Distribution Rehabilitation Project</i>, <i>India - Haryana Power System Improvement Project</i> and the <i>Honduras - Power Sector Efficiency Enhancement Project (PROMEF)</i>.</p>			
<b>WB Lending Operation Informed</b>	<b>Project ID</b>	<b>Approval FY</b>	<b>Amount (US\$)</b>
<i>Brazil - Electrobras Distribution Rehabilitation Project</i>	<i>P114204</i>	<i>FY2010</i>	<i>\$388 M WB loan</i>
<i>India - Haryana Power System Improvement Project</i>	<i>P110051</i>	<i>FY2010</i>	<i>\$330 M WB loan</i>
<i>Honduras - Power Sector Efficiency Enhancement Project (PROMEF)</i>	<i>P110434</i>	<i>FY2010</i>	<i>\$ 4.2 M WB loan</i>
<i>Mozambique - Energy Development and Access Project (EDAP)</i>	<i>P108444</i>	<i>FY2010</i>	<i>&lt; \$0.3 M WB loan</i>
<i>Ghana - Energy Development and Access Project (GEDAP)</i>	<i>P120016</i>	<i>FY2010</i>	<i>&lt;\$0.2 M WB loan</i>
<i>Malawi - Energy Sector Project</i>	<i>P099626</i>	<i>FY2010</i>	<i>&lt;\$0.3 M WB loan</i>

Besides, the Bank provided technical assistance in the design and implementation of the *AMI PRISMA Project* in the electricity distribution companies in the Dominican Republic. The project fully follows the approach described in this knowledge product. The initial phase of the project was completed in December 2011, with very positive results in terms of loss reduction which allowed investments to be paid back in a shorter period of time.

**ESMAP ACTIVITY:** ENERGY EFFICIENCY CITIES PROJECT SUPPORT FACILITY (P120479) (ONGOING)

**FISCAL YEAR:** 2010

**COUNTRY:** GLOBAL

**OUTCOME:** DEVELOPMENT FINANCING INFORMED

**INDICATOR:** PREPARATION OF NEW OPERATIONS INFORMED

Since its launch in October 2008, ESMAP's EECl has promoted lending for energy efficiency in the urban sector in a number of countries. Under its *EE Cities Project Support Facility*, EECl has provided technical support in the design, preparation, and supervision of urban energy efficiency components in the Bank's investment operations. To date, EECl has supported municipal EE components for nine urban investment lending projects of the World Bank:

- **Macedonia** - EECl has contributed to leveraging Global Environment Facility funding to improve energy use in municipal buildings, primary schools, and kindergartens in Skopje, Macedonia. EECl assisted the *Global Environment Facility (GEF) Sustainable Energy Project (P089656, restructured in 2010, \$3.2 M)* team to supervise the implementation of the energy efficiency activities.
- **Mexico** - EECl helped develop an equipment supply and distribution contract to provide efficient light bulbs to urban residential households, under the *Efficient Lighting and Appliances Project (P106424, FY2011, \$70 M)* jointly financed by the Clean Technology Fund (CTF), GEF and WB.
- **Ningbo (China)**: EECl assisted in the design and preparation of the *Ningbo New Countryside Development Project (P109956, FY2010, \$0.6 M)*, a program that includes implementing an energy-efficient pilot in a rural township and strengthening the city's implementation capacities.
- **Tianjin (China)**: EECl helped design and prepare the green building component *the Sino-Singapore Tianjin Eco-City Project (P098915, FY2011, \$6.2 M)*.
- **West Bank**: EECl helped develop a municipal EE retrofit pilot in West Bank, under the *Municipal Development Program Phase I (P111741, FY2010, \$0.7 M)*
- **Armenia**: EECl also assisted the World Bank's Europe and Central Asia energy unit to prepare a public sector energy efficiency retrofit program in support of the proposed *Electricity Supply Reliability and Energy Efficiency Project* in Armenia (approved in March 2012, \$1.8 M (GEF), with \$8.3 million in local co-financing). The EE component, aimed at reducing existing information, regulatory and financial barriers that hamper the wide penetration of EE investments in public buildings and the commercial and residential sectors, was dropped at appraisal due to funding gaps for the transmission line component of the project.

EECl is also supporting two key projects currently under preparation which are expected to go the Board for approval during FY2012/FY2013:

1. **Shanghai (China)**: EECl is helping a Bank team to design a project that would finance commercial building EE retrofit (proposed \$100 M IBRD, FY2013).
2. **Ukraine**: EECl has supported the design and preparation of the municipal energy efficiency component of the *Ukraine Energy Efficiency (P096586)*. EECl also provided technical assistance to carry out a municipal energy efficiency market study covering two cities and sector-wide issues. A CTF loan of about \$50 M in support of municipal energy efficiency EE investments is currently pending.

WB Lending Operation Informed	Project ID	Approval FY	Amount (US\$)
<i>Macedonia - Global Environment Facility (GEF) Sustainable Energy Project</i>	<i>P089656</i>	<i>FY2010</i>	<i>\$3.2 M WB loan</i>
<i>Mexico - Efficient Lighting and Appliances Project</i>	<i>P106424</i>	<i>FY2011</i>	<i>\$70 M WB loan</i>
<i>China - Ningbo New Countryside Development Project</i>	<i>P109956</i>	<i>FY2010</i>	<i>\$0.6 M WB loan</i>
<i>China - Sino-Singapore Tianjin Eco-City Project</i>	<i>P098915</i>	<i>FY2011</i>	<i>\$6.2 M WB loan</i>
<i>West Bank - Municipal Development Program Phase I</i>	<i>P111741</i>	<i>FY2010</i>	<i>\$0.7 M WB loan</i>

**ESMAP ACTIVITY: ENERGY EFFICIENCY FOR WATER AND SANITATION UTILITIES (P125354)**

**FISCAL YEAR: 2011**

**COUNTRY: GLOBAL**

**OUTCOME: DEVELOPMENT FINANCING INFORMED**

**INDICATOR: PREPARATION OF NEW OPERATIONS INFORMED**

This ESMAP activity discusses the main issues, options, approaches, cost and benefits of energy use and efficiency for network-based water supply and wastewater treatment in urban areas. It provides a simple operational framework to help strategic decision-making on how to best invest resources over the range of options, supplemented with guidance on successful models to implement such strategies.

This note is expected to provide World Bank urban and energy operational staff with the basic information and useful guidance for engaging client countries on managing energy costs and improving EE in wastewater utilities. ESMAP, through EEI, is currently supporting the preparation of *OSE Response to Climate Change Project (P118064) for Uruguay*, which, among other things, supports the development and implementation of a comprehensive energy management program for Uruguay's national water and wastewater utility. The project is scheduled for Board approval in July 2012 (FY2013).

**ESMAP ACTIVITY: PUBLIC PROCUREMENT OF ENERGY EFFICIENCY (P112187)**

**FISCAL YEAR: 2009**

**REGION / COUNTRY: GLOBAL**

**OUTCOME: DEVELOPMENT FINANCING INFORMED**

**INDICATOR: PREPARATION OF NEW OPERATION INFORMED**

In 2010 ESMAP published the analytical report *Public Procurement of Energy Efficiency Services: Lessons from International Experience* offering specific solutions to address institutional, regulatory, financial and technical barriers to procuring EE services in the public sector. The publication targets policy makers and public sector practitioners and looks at a largely untapped energy efficiency market in developing countries – the public sector. It examines factors that affect the achievement of large-scale savings in this sector, such as insufficient incentives to lower energy costs, rigid budgeting and procurement procedures, and limited access to financing.

Although this analytical work directly informed the GEF - Armenia Electricity Supply Reliability and Energy Efficiency Project approved in March 2012 (P116680, \$1.82 M (GEF), with \$8.3 million in local co-financing). The EE component of the loan, aimed at reducing existing information, regulatory and financial barriers that hamper the wide penetration of EE investments in public buildings and the commercial and residential sectors, was dropped at appraisal due to funding gaps for the transmission line component of the project. The concepts developed under this analytical work are also currently being developed/replicated in China, Serbia, Macedonia, and Kazakhstan.

WB Lending Operation Informed	Project ID	Approval FY	Amount (US\$)
<i>GEF - Armenia Electricity Supply Reliability and Energy Efficiency Project</i>	<i>P116680</i>	<i>FY2012</i>	<i>\$1.82 M (GEF) loan</i>



## Energy Efficiency Activities with Limited or Unobservable Results

Of the 28 completed activities that were reviewed, the desk assessment could not easily track impacts or specific outcomes for 10 of them. Outputs for some of these activities have recently concluded and disseminated, therefore identifying outcomes is still premature. Details are provided below.

**ESMAP ACTIVITY :** VIETNAM FUEL EFFICIENCY, TRADE FACILITATION AND GHG REDUCTIONS PROJECT (P119287)

**FISCAL YEAR:** 2010

**COUNTRY:** VIETNAM

This first phase of the project, funded by ESMAP, identified policy and physical constraints related to the increased use of the waterways for freight movements by land and by coastal shipping (type of good, quantities, trip sources and origins, containerization extent, shipping cost). It also identified infrastructure deficiencies and institutional impediments to more intensive use of coastal shipping and propose areas for improvement in both infrastructure and policy that would lead to lowering shipping cost. A second phase and ongoing Phase 2 of the projects (financed by the Trade Facilitation Facility) is expected to lead to substantial policy recommendations and reforms and potentially lead to a Bank lending operation. No direct outcomes have been identified at this point.

**ESMAP ACTIVITY:** CHISINAU ENERGY SUPPLY IMPROVEMENT (P123396)

**FISCAL YEAR:** 2011

**COUNTRY / REGION:** MOLDOVA / EUROPE AND CENTRAL ASIA

This activity is the second phase of the ESMAP-funded project *Moldova - District Heating Restructuring (P113570)* which led to a Policy Note outlining actions to reform the DH sector to financial sustainability. Phase II is expected to provide policy options on debt and corporate restructuring to resolve the outstanding financial issues of both the heating and electricity sectors in Chisinau. The project was recently completed (October 2011) therefore it is still premature to measure any results related to the implementation of the proposed recommendations.

**ESMAP ACTIVITY:** ENERGY EFFICIENT STUDY (P121254)

**FISCAL YEAR:** 2010

**COUNTRY / REGION:** EGYPT / MIDDLE EAST AND NORTH AFRICA

The activity enhanced understanding by the Egyptian policy makers of the international experience and best practices in promoting energy efficiency, and helped identify key barriers to energy efficiency improvement in Egypt and the actions required to promote and sustain energy efficiency in Egypt. It increased understanding by the Bank of the energy efficiency market and environment in Egypt and better positioned to mainstreamed energy efficiency work into the Bank's overall country energy assistance strategy and program. An ongoing follow up activity requested by the government, *Energy Efficiency Study Phase II (P124688)*, also, supported by ESMAP, aims to support GoE to address the key issues and barriers identified in the Phase I and will help create a more clearly defined and effective institutional, regulatory, policy and financing environment to support and sustain improvements in energy efficiency in Egypt. No direct outcomes have been identified at this point.

**ESMAP ACTIVITY:** EECI SMALL GRANTS (ZARQA) (P122924)

**COUNTRY / REGION:** JORDAN / MIDDLE EAST AND NORTH AFRICA

**FISCAL YEAR:** 2011

Under the EE Cities Small Grants, EECI has provided direct technical support to help selected cities identify opportunities for EE improvements. This assistance has been offered to complement the Cities Alliance's grants for preparing city development strategies, as part of EECI's partnership with the Cities Alliance. In this context, grants are provided to cities to finance the implementation of EE pilots in municipal service sectors - water/wastewater, power/heating, housing, city lighting, buildings and transport. To this date, grants have been awarded to the cities of Quezon in Philippines and Zarqa in Jordan.

The second grant under the *EECI Small Grant* project is assisting the Municipality of Zarqa in Jordan to develop energy efficient mobility plan for the city's downtown area. The study has been recently completed and drawing conclusions on specific results is still premature. However, the activity helped to increase client capacity for the Ministry of Municipal Affairs and Zarqa transport department for the joint *urban mobility plan* prepared with the

Zarqa city staff.

**ESMAP ACTIVITY: STUDY ON ENERGY SAVINGS OPPORTUNITIES IN LARGE BUILDINGS (P111239)**

**FISCAL YEAR: 2009**

**COUNTRY / REGION: AFGHANISTAN / SOUTH ASIA**

The ESMAP activity produced a report identifying energy savings opportunities in large buildings and provided recommendations on implementing effective EE measures in the existing buildings. The final report, together with energy audits of a sample of buildings and a management plan for audit instruments, were submitted to the Ministry of Energy and Water (MEW). MEW displayed commitment to EE and results of the work were recently discussed in the first National Afghanistan Conference on Energy Efficiency. Building on the TA, the Bank team is continuing the engagement with the counterpart to take forward the conclusions of the report, including leading discussions on the development of national EE policies and programs. No direct outcomes have been identified at this point.

**ESMAP ACTIVITY: TRANSPORT & CLIMATE CHANGE (P113671)**

**FISCAL YEAR: 2009**

**COUNTRY: GLOBAL**

The project provided input to the Bank's Transport Sector report 'Transport and Climate Change Flagship Study' with emphasis on how to pursue innovative ideas for action addressing urban transport in the context of improving fuel efficiency using an analytical approach. The study charts the way forward for factoring climate change into the Bank's transport operations over the short, medium and long term. The flagship report provides policy guidance to the transport sector community inside and outside the Bank, and recommends new project types to facilitate the Bank's efforts in addressing climate change. However, no specific or direct outcomes have been identified at this point.

**ESMAP ACTIVITY : ENERGY EFFICIENCY COUNTRY PERFORMANCE INDICATORS (P119866)**

**FISCAL YEAR: 2011**

**COUNTRY / REGION: GLOBAL**

This ESMAP activity completed a global review of the use of indicators for national energy efficiency performance assessment. The activity, carried out in response to a request from the World Bank Independent Evaluation Group (IEG)'s, included a review of the methodology used and preparation of several country case studies in which EE indicators were used for national and sector EE performance assessment. As part of study, ESMAP and the Energy Unit of the World Bank co-hosted an International Roundtable on EE Performance Indicators in June 2010.

Based on the discussions from the Roundtable, a communications note was prepared and circulated with a set of actionable recommendations to Bank management to improve EE indicators and enhance the collaboration between the Bank country operations and IEA on future Bank country EE assessment studies. Despite the progress in achieving consensus among international agencies, key stakeholders and EE practitioners about the importance of developing and using robust methodology and well defined indicators for national EE assessment, a measurable outcome is yet to be identified for this activity.

**ESMAP ACTIVITY: EECI/URBAN MOBILITY STRATEGIES (P119918)**

**FISCAL YEAR: 2010**

**COUNTRY / REGION: GLOBAL**

This activity developed a Guidance Note providing detailed and practical recommendations on how city bus operations managers and their technical staff can plan and implement Operations and Maintenance (O&M) practices to their fleets without significant capital investments. By implementing such recommendations, municipal officials and bus operators can increase the efficiency and fuel economy of their bus systems and reduce their cities' energy consumption, congestion and pollution. A validation of the recommended actions in the guidance note was carried out through field testing conducted in three cities in southern India (Hyderabad, Vijayawada and Mysore) leading to valuable conclusions and feedback received from the senior managers of bus corporations. The validation exercise was recently completed and it is still premature to measure direct results – however, the recommended approach has a great potential and could be implemented without significant changes in operating structures, capital investment or upfront preparation.



**ESMAP ACTIVITY:**

- ENERGY EFFICIENCY IN WATER UTILITIES (P120480) (AFRICA)
- IBNET ENERGY M & T PILOT (P120481)

**FISCAL YEAR:** 2010**COUNTRY / REGION:** GLOBAL

EECI, in collaboration with the Africa unit of WB's Water and Sanitation Program (WSP), carried out a pilot to implement energy management system at Lusaka Water and Sewerage Company (LWSC). EECI worked with a LWSC team and developed concrete recommendations in implementing energy monitoring and targeting (M&T) and in non-revenue water reduction. A policy note, summarizing the lessons learned from the pilot, was developed providing practical information to facilitate energy M&T implementation among water and sewerage utilities (WSUs) in developing countries. EECI, WSP and the Bank's Water Anchor have proposed to produce a Primer on EE for WSUs as a broader and expanded effort to help engage client countries on the subject matter and to inform Bank operational teams about good practices and empirical lessons for developing new projects.

Although there has been growing interest and increased engagement from client countries, there is no evidence yet that they have implemented energy monitoring and targeting (M&T) on existing water and sewerage utilities.

### Ongoing Energy Efficiency Activities

**ESMAP ACTIVITY :** HEAT REGULATION PHASE II (P116044) (ONGOING)**COUNTRY / REGION:** CHINA / EAST ASIA AND PACIFIC**FISCAL YEAR:** 2009

This *ongoing* TA is helping the government prepare the draft of a national Heat Regulation. The legal document is expected to be prepared by MOHURD in the Government's coming Five Year Plan (2011-2015). The project team has provided advisory support to MOHURD on enhancing the institutional model for DH regulation.

The recommendations were presented, discussed and well received during a workshop in Beijing in April 2010, attended by Deputy Directors General from MOHURD. The project team is expected to provide comments on the Policy Paper prepared by MOHURD consultants for drafting the Regulation. Follow up support could be provided through the ongoing GEF Heat Reform and Building Energy Efficiency Project which includes support for policy development in district heating sector reform.

**ESMAP ACTIVITY:** GOVERNMENT FACILITIES ENERGY EFFICIENCY (P123066)**COUNTRY / REGION:** CHINA / EAST ASIA AND PACIFIC**FISCAL YEAR:** 2011

The objective of the project is to enable better informed policy-making for operationalizing a platform of policies and programs to promote energy efficiency more aggressively in government facilities in China. The intention is to initiate upstream dialogue on policies and programs to promote energy efficiency in central government facilities of China.

**ESMAP ACTIVITY:** ENERGY EFFICIENCY STRATEGY FOR INDUSTRIAL SECTOR (P122464)**COUNTRY / REGION:** UZBEKISTAN / EUROPE AND CENTRAL ASIA**FISCAL YEAR:** 2011

The objective of the study is to assist Ministry of Economy, which is responsible for energy efficiency in Uzbekistan, in developing and energy efficiency strategy and policy that will enable the government to systematically and effectively target energy efficiency savings in the manufacturing sector.

**ESMAP ACTIVITY:** ENERGY EFFICIENCY STRATEGY (PHASE 2) (P124688)**COUNTRY / REGION:** EGYPT / MIDDLE EAST AND NORTH AFRICA**FISCAL YEAR:** 2011

The objective of the activity is to help create a better institutional, regulatory, policy and financing environment to support and sustain improvements in energy efficiency in Egypt.

**ESMAP ACTIVITY: ENERGY EFFICIENCY INITIATIVES TOWARDS LOW CARBON TRANSPORT (P123713)**

**COUNTRY / REGION: BRAZIL / LATIN AMERICA AND CARIBBEAN**

**FISCAL YEAR: 2011**

This proposed activity is to support two initiatives: (i) energy efficient freight and logistics sector (to support development and dissemination of a program of studies and pilots in green freight); and (ii) energy efficiency in the urban transport sector (to distill, disseminate and replicate good practices in public transport investments in the LAC Region).

**ESMAP ACTIVITY: ANALYSIS OF COST OF DELIVERING DEMAND SIDE ENERGY EFFICIENCY ACTIVITIES (P119998)**

**COUNTRY / REGION: GLOBAL**

**FISCAL YEAR: 2011**

The objective of the project is to develop a conceptual framework for assessing the transaction costs and its components associated with demand side energy efficiency projects, which will enhance the understanding of these costs. As part of activity, an illustrative assessment was conducted of the first order range of delivery costs for selected demand side energy efficiency programs/technologies.

## 4. CLEAN ENERGY

### Africa Region

**ESMAP ACTIVITY: MOZAMBIQUE MODERN BIOFUELS ASSESSMENT (P101999)**

**FISCAL YEAR: 2009**

**COUNTRY: MOZAMBIQUE**

**OUTCOME: POLICY/STRATEGY INFORMED**

**INDICATOR: GOVERNMENT POLICY/STRATEGY INFORMED**

**OUTCOME: DEVELOPMENT FINANCING INFORMED**

**INDICATOR: PREPARATION OF NEW OPERATION INFORMED**

This ESMAP activity was in response to a request from the Government of Mozambique (GoM) to provide technical assistance to assess the feasibility of producing and marketing modern biofuels as alternative renewable fuels for transport, industry, power generation, and households. The activity involved a technical, economic, social, and environmental assessment – including the design of a draft national biofuels program and implementation strategy. The study has served as the main input to the preparation of the GoM policy on biofuels in 2009. Prior to this activity, there was no specific legislation on biofuels despite the very attractive opportunity to develop a vibrant biofuels sector in the country. In March 2009, GoM adopted a National Policy and Strategy for biofuels that establishes regulatory guidelines for both the public and private sector to better participate in the biofuels industry. The government also created the National Biofuel Council, a body that will coordinate, supervise and evaluate the policy and strategy, focusing on production of ethanol and biodiesel.

The activity also informed the Energy Development and Access Project, a World Bank lending project of US\$49.7 million which included a sub-component that, among others, will introduce stationary and mobile energy services using locally produced biofuels (Direct Vegetable Oil – DVO and/or Biodiesel) in villages. This subcomponent has US\$3.2 million funding from IDA.

WB Lending Operation Informed	Project ID	Approval FY	Total financing (US\$)
Energy Development and Access Project	P108444,	FY2010	\$3.2 M (IDA)

<b>ESMAP ACTIVITY: LOW CARBON GROWTH (P108461)</b>			
FISCAL YEAR: 2009			
COUNTRY: SOUTH AFRICA			
OUTCOME: DEVELOPMENT FINANCING INFORMED		INDICATOR: PREPARATION OF NEW OPERATION INFORMED	
OUTCOME: POLICY/STRATEGY INFORMED		INDICATOR: GOVERNMENT POLICY/STRATEGY INFORMED	
<p>This ESMAP activity supported the Government's Long Term Mitigation Scenario, the Renewable Energy Market Transformation (REMT) project, and the South African Cities Network (SACN) program. The study identified mitigation priorities as: industrial energy efficiency, renewable energy, nuclear energy, modal shift through improved public transportation, and improved vehicle efficiency and focused on building capacity for energy efficiency and demand-side management solutions. These outputs informed to the preparation of the Eskom Support project as well as to the development of the Clean Technology Fund (CTF) investments of USD 500 million.</p> <p>ESMAP provided support to South Africa to review their draft Long Term Mitigation Strategy (LTMS) which facilitated dialogue and discussion ahead of the LTMS results being delivered to Cabinet. The LTMS was subsequently adopted in 2009. ESMAP further provided policy advice on a power rationing program to manage the power crisis in 2008 and guidance on the design of a Standard Offer Program to encourage demand side management, both supporting the Government of South Africa with implementation of energy efficiency goals in its Long-Term Mitigation Scenario (LTMS).</p> <p>To facilitate the implementation of the Long-Term Mitigation Scenario developed by the Government of South Africa in 2006. South Africa's study funded an international peer review of the Long-Term Mitigation Scenario.</p>			
<b>WB Lending Operation Informed</b>	<b>Project ID</b>	<b>Approval FY</b>	<b>Total financing (US\$)</b>
South Africa Eskom Renewables Support Project	P122329	FY2012	\$250 M (CTF) plus \$260 M (IBRD)

<b>ESMAP ACTIVITY: ROAD TO DURBAN – ENERGY MINISTERS EVENT (AAA) (P126747)</b>			
FISCAL YEAR: 2012			
COUNTRY: REGIONAL			
OUTCOME: KNOWLEDGE INCREASED		INDICATOR: FACILITATED EXCHANGE OF BEST PRACTICE WITH CLIENTS	
<p>Knowledge materials were prepared to assist Ministers of Energy in African countries to contribute to climate change negotiations by emphasizing priorities related to energy access and their link to climate change financial instruments. The reports were finalized and disseminated to high level officials and development partners at the COP/MOP climate conference in Durban in December 2011. There has also been follow-up interest by the Government of South Africa for support going forward in climate and energy access leading up to Rio+20.</p>			

### East Asia and Pacific Region

<b>ESMAP ACTIVITY: URBAN TRANSPORT CLIMATE CHANGE STUDY (P110557)</b>			
FISCAL YEAR: 2009			
COUNTRY: CHINA			
OUTCOME: DEVELOPMENT FINANCING INFORMED		INDICATOR: PREPARATION OF NEW OPERATION INFORMED	
<p>The purpose of this initiative was to support the development of the urban rail sector in China. This was a joint product developed with the Institute for Comprehensive Transport under National Development &amp; Reform Commission (NDRC). ESMAP supported policy and analytical advice to the government on orienting urban transport on to a low-carbon path. Activities included (i) Guangzhou truck pilot; (ii) Beijing support for rapid bus commuting; (iii) Urban rail study. The rail study resulted in a new lending project (Kunming Urban Rail Project – IBRD 300m) and the Guangzhou truck pilot resulted in the Guangzhou Truck technology GEF (US\$5 million).</p>			
<b>WB Lending Operation Informed</b>	<b>Project ID</b>	<b>Approval FY</b>	<b>Total financing (US\$)</b>
Kunming Urban Rail Project	P117656	2011	\$300 M (IBRD)
Guangdong Green Freight Demost. Project ()	P119654	2011	\$5 M (GEF)

<b>ESMAP ACTIVITY: EVALUATION OF THE INCENTIVES MECHANISMS FOR WIND POWER (P123227)</b>	
FISCAL YEAR: 2011	
COUNTRY: CHINA	
<b>OUTCOME: POLICY/STRATEGY INFORMED</b>	<b>INDICATOR: GOVERNMENT POLICY/STRATEGY INFORMED</b>
<p>In line with China's announcement of its plans to reduce the energy intensity of its GDP, ESMAP funded the development of policy notes to review the major policies adopted by Chinese agencies and provide technical and policy advice on their effectiveness. The ESMAP policy note <i>Evaluating the Government's Renewable Energy Targets</i> has been finalized and accepted by the various counterpart institutions in China. As a follow-up to the Government plan to scale up renewable energy (10% by 2010 and 15% by 2020 from its current level of about 8%), the policy note re-evaluates the RE development targets considering the latest changes in the energy sector, and provides policy recommendations to the Government on developing optimal targets for scaling up renewable energy. In doing this, a model for evaluating the RE targets at the provincial and national levels was developed, with the description of methodology, findings and recommendations for setting the RE targets.</p> <p>The recommendations of the policy note regarding priority development of hydropower and improving the performance of wind power have been included in the 12<sup>th</sup> Five-Year-Plan (2011-2015). The recommendations on promoting trade and developing green electricity schemes may be included in the revised long-term RE plan.</p>	

<b>ESMAP ACTIVITY: INDONESIA LOW CARBON GROWTH STRATEGY (P108804)</b>			
FISCAL YEAR: 2009			
COUNTRY: INDONESIA			
<b>OUTCOME: DEVELOPMENT FINANCING INFORMED</b>	<b>INDICATOR: EXISTING OPERATIONS INFORMED</b>		
<p>The Indonesia Low Carbon Growth study identified that assistance was needed in integrating climate change issues into national development planning and budgeting and to develop approaches to reduce emissions from manufacturing, as well as identifying price adjustments for electricity and fossil fuels. There are now a series of Climate Change Development Policy Loans under implementation in Indonesia designed to support the Indonesian government in its efforts to adopt a lower carbon, more climate-resilient growth path. The first policy loan focuses on (i) addressing the need to mitigate Indonesia's greenhouse gas emissions; (ii) enhancing adaptation and resiliency efforts in key sectors; and (iii) strengthening the institutions and policies needed for a successful climate change response. The Climate Change DPL marks the first in a planned series of four annual loans of similar value, with the DPL2 already in the pipeline (P123135).</p>			
<b>WB Lending Operation Informed</b>	<b>Project ID</b>	<b>Approval FY</b>	<b>Total financing (US\$)</b>
Indonesia Climate Change Development Policy Loan	P120313	2010	\$200 M WB loan

<b>ESMAP ACTIVITY: RENEWABLE DEVELOPMENT AND MARKET REFORM (P112371)</b>	
FISCAL YEAR: 2009	
COUNTRY: PHILIPPINES	
<b>OUTCOME: POLICY/STRATEGY INFORMED</b>	<b>INDICATOR: GOVERNMENT POLICY/STRATEGY INFORMED</b>
<b>OUTCOME: CLIENT CAPACITY INCREASED</b>	<b>INDICATOR: DESIGN CAPACITY INCREASED</b>
<b>OUTCOME: DEVELOPMENT FINANCING INFORMED</b>	<b>INDICATOR: PREPARATION OF NEW OPERATION INFORMED</b>

The ESMAP-funded TA to the Philippines has provided policy support to the Government to develop an implementation framework for the RE Law passed in October 2008. In parallel, it has helped establish an institutional framework and mechanisms to carry out these mandates. ESMAP support has also included capacity building for the Energy Regulation Commission on feed-in tariff pricing / avoided costs to determine prices for renewables and recovery through regulated tariffs. Through the activity, the Department of Energy of the Philippines recently determined a Feed-in Tariff level for new RE generation, and critical cost recovery options have also been designed.

As part of the ESMAP activity, a workshop in Manila (“International Experience on Renewable Energy Development Technical Workshop”, April 2010) informed Philippine RE policymakers and other practitioners of various country experiences and innovative solutions. It helped stakeholders share international experience in a number of specific areas, including support mechanisms for the development of RE markets and challenges in the integration of RE in transmission system development and operation.

The TA informed a \$250 million CTF loan for Philippines to improve efficiency in distribution and support renewable investment.

<b>WB Lending Operation Informed</b>	<b>WB's total financing (US\$ million)</b>
<i>Clean Technology Fund</i>	\$250 M (CTF)

**ESMAP ACTIVITY: CAPACITY BUILDING FOR RENEWABLE ENERGY (P119220)**

**FISCAL YEAR: 2010**

**COUNTRY: REGIONAL**

**OUTCOME: CLIENT CAPACITY INCREASED**

**INDICATOR: DESIGN CAPACITY INCREASED**

The objectives of this activity were (i) to build local capacity in East Asia for renewable electricity analysis and assessment using the RETScreen Clean Energy Project Analysis Software (RETScreen); and (ii) identify local renewable energy practitioners in selected countries.

The training activity expanded local capacity to assess renewable projects through learning to use a free analysis tool and its database. The participants were drilled in 5 case studies, with 2 extra assignments in some countries. The workshops were attended in total by 96 participants in the 4 countries, including 47% professors/lecturers, students and specialists from academe and research institutions; 26% from government agencies involved in power planning, energy policy design and analysis, energy sector regulation, rural electrification and RE policy implementation; and the remaining 27% from power companies, financial institutions and non-government organizations [NGOs].

Prior to the workshops, almost all (95%) of the participants were not aware, or had very little knowledge, of RETScreen and 72% were not even aware that there are free-of-charge software for assessing RE technologies. From results of survey, more than half of the participants mentioned that they would use the software for assessing investment projects and doing project development work, including due diligence exercises. About a third would use RETScreen for RE policy design and analysis. Five percent of the participants would use the software for general research and development work, and for RE market studies. Seventeen percent mentioned that they would disseminate and provide further training in RETScreen.

## Europe and Central Asia Region

<b>ESMAP ACTIVITY: REGULATION OF RENEWABLE ENERGY (P107982)</b>	
FISCAL YEAR: 2009	
COUNTRY: BULGARIA	
<b>OUTCOME: POLICY/STRATEGY INFORMED</b>	<b>INDICATOR: GOVERNMENT POLICY/STRATEGY INFORMED</b>
<p>ESMAP provided this technical assistance to the Bulgarian State Energy and Water Regulatory Commission (SEWRC) when it needed to be strengthened to meet the challenging EU targets for renewable energy. Evidence of substantial impact from this TA can be found in the concrete measures taken by the Government to improve the regulatory framework. Specifically:</p> <ol style="list-style-type: none"> <li>1. amendments to RE law have been developed by SEWRC for feed-in tariffs designed to ensure a sufficiently attractive return and secure cash flow to the investor for the life of the project;</li> <li>2. procedures for RE developers to access the transmission system have been clarified and streamlined;</li> <li>3. renewable energy guarantees of origin (REGOs) have been issued by SEWRC since 01.01.2009 and amendments have been introduced to make the REGOs transferrable;</li> <li>4. work has been initiated on the provisions in the RE law on heating and cooling;</li> <li>5. structural changes to SEWRC are envisaged in the new Energy Act as per the report's recommendations; and</li> <li>6. the guidance of the report on the communication strategy is being actively used.</li> </ol> <p>A series of capacity building activities were undertaken, including stakeholder workshops which helped the country to improve and amend the regulatory framework for RE, including amendments to RE law for feed-in tariffs; procedures for RE developers to access the transmission system have been clarified and streamlined; issuing of renewable energy guarantees of origin (REGOs); development of provisions in the RE law on heating and cooling</p>	

<b>ESMAP ACTIVITY: LOW CARBON GROWTH STUDY (P114517)</b>	
FISCAL YEAR: 2009	
COUNTRY: POLAND	
<b>OUTCOME: POLICY/STRATEGY INFORMED</b>	<b>INDICATOR: GOVERNMENT POLICY/STRATEGY INFORMED</b>
<b>OUTCOME: CLIENT CAPACITY INCREASED</b>	<b>INDICATOR: DESIGN CAPACITY STRENGTHENED</b>
<p>This low carbon assessment has had direct policy impacts in the country. This has been supported by an enhanced dialogue on energy and low-carbon issues – particularly the energy efficiency agenda – mainly with Poland's Ministry of Economy. The study has opened up opportunities for Bank representatives to engage in Poland's Energy Round Table, a series of high-level discussions organized by a Warsaw-based thinktank, demosEuropa, on Poland's low carbon strategy and linked to Poland's EU Presidency in the second half of 2011. A USD 1 billion Energy Efficiency DPL is under preparation.</p> <p>The macroeconomic models developed and used in the Poland low carbon study will be maintained by the Ministry of Economy, in cooperation with specialists from other agencies, as a tool for policy analysis; strengthening capacity in the Polish public administration. The DGSE model, developed within the project by a Warsaw-based think tank, is one of the few models of this type, applicable for energy and climate policy analysis in the world, and will be used in further studies related to energy efficiency in Poland.</p> <p>Additional applications of the suite of models developed with the support of ESMAP are already underway in Poland. There is interest in similar work being initiated with other clients in ECA.</p>	

<b>ESMAP ACTIVITY: REGULATION OF RENEWABLE ENERGY (P090657)</b>	
FISCAL YEAR: FY2008-09	
COUNTRY: SLOVAK REPUBLIC	
<b>OUTCOME: POLICY/STRATEGY INFORMED</b>	<b>INDICATOR: GOVERNMENT POLICY/STRATEGY INFORMED</b>
<p>The ESMAP activity provided support to the Slovak Regulatory Office for Network Industries (RONI) to carry out key tasks needed to complete the basic legislative and regulatory framework for renewable energy sources (RES) while providing investors with adequate information about the regulatory environment, including transparent and</p>	



predictable tariff-setting and offtake arrangements. The key tasks included: (i) development of procedures and methodology for pricing of electricity produced from renewable energy sources (RES); (ii) design of specific support schemes for increased RES utilization; (iii) establishment of accurate and reliable system of issuing guarantees of origin for RES-based electricity; and (iv) training regulatory staff in best practice RES regulation.

Following the ESMAP activity, a Renewable Energy Act was passed in June 2007 in the country, which includes: broadly defined regulatory provisions for the promotion of RES utilization, such as mandatory connection of RES-based electricity generators into the national grid, mandatory off-take obligation of RES-based electricity, heat for the national electricity company (NEK) and the regional electricity distribution companies at preferential prices, issuance of guarantees of origin and exchangeable green certificates for electricity and heat generated from RES, and, adoption of “preferential tariffs” for electricity generated from RES.

## Latin America and Caribbean Region

<b>ESMAP ACTIVITY:</b> CAPACITY BUILDING IN RENEWABLE ENERGY FOR IMPLEMENTING AGENCIES IN LAC (P115422)	
<b>FISCAL YEAR:</b> 2009	
<b>COUNTRY:</b> REGIONAL	
<b>OUTCOME:</b> CLIENT CAPACITY INCREASED	<b>INDICATOR:</b> IMPLEMENTATION CAPACITY STRENGTHENED
<p>In Bolivia, the technical assistance was delivered to the Vice Ministry of Electricity and Alternative Energies, within the Ministry of Energy and Hydrocarbons. The TA focused on two main activities: a pilot project for Pico PV systems (small systems ranging from 20-50Wp); and small Size PV (50-500Wp): Solar Home Systems (SHS) component of the Decentralized Infrastructure for Rural Transformation (IDTR) Project and upcoming GPOBA project.</p> <p>The results of the Pico Photovoltaic (PV) pilot activity have proved the potential of Pico PV products by defining a model for the dissemination of the small solar lanterns. The Solar Home Systems TA has helped strengthen the implementation of the SHS component of the IDTR project and design the modalities for the installation of 7,000 SHS under the GPOBA project.</p> <p>In Peru, the technical assistance was delivered to a number of Ministries and Government agencies: the Ministry of Energy and Mines (MEM), the electricity regulator OSINERGMIN, the Directorate of Competitive Funds (DFC), and the distribution companies in Peru. The technical assistance TA has contributed to the mainstreaming of PV as a rural off-grid electrification option in areas where this is the least-cost option and improved the capacity of the agencies involved to prepare, fund, and supervise rural electrification projects using PV systems.</p>	

<b>ESMAP ACTIVITY:</b> LOW CARBON COUNTRY CASE STUDY (P105702)	
<b>FISCAL YEAR:</b> 2010	
<b>COUNTRY:</b> BRAZIL	
<b>OUTCOME:</b> DEVELOPMENT FINANCING INFORMED	<b>INDICATOR:</b> PREPARATION OF NEW OPERATION INFORMED
<p>As a recent development of the study, the dialogue on low-carbon growth with the Brazilian Government is now being brought to the next stage through the Partnership for Market Readiness (PMR). The PMR, a World Bank initiative launched at Cancún and that Brazil has decided to join, brings together non-Annex 1 and Annex 1 countries, including Mexico, Chile, Colombia, Costa Rica, China, India, Turkey, Morocco, US, Japan, Norway and the European Union to share experience on domestic instruments that could facilitate the achievements of emissions reductions targets. As a result, a new Bank grant on the market instruments for the Brazilian Climate Change policy is being prepared for Brazil under the PMR, of which the Ministry of Finance will be the main counterpart.).</p>	
<b>OUTCOME:</b> POLICY/STRATEGY INFORMED	<b>INDICATOR:</b> GOVERNMENT POLICY/STRATEGY INFORMED
<p>The Brazil low carbon study significantly “fuelled” an on-going and growing national debate on climate change, including a national consultative debate that laid out the implementation of the national climate change plan and law that contains voluntary commitments presented by Brazil to the international community in Copenhagen and again in Cancún.</p>	
<b>OUTCOME:</b> CLIENT CAPACITY INCREASED	<b>INDICATOR:</b> DESIGN CAPACITY STRENGTHENED



The Brazil low carbon study has supported many, frequent and substantial interactions and capacity building across the government and public agencies– Sao Paulo State Waste Management Agency (CETESB) is using the methodology developed for the waste sector and the Brazilian Agricultural Research Corporation (EMBRAPA) is using the methodology developed for the land Use and Land-Use charge. There is improved information sharing across sectors and within the public sphere, stronger linkages between technical research groups and corresponding government ministries and agencies. More than 15 technical reports and 4 synthesis reports have been commissioned with the involvement of more than 30 recognized Brazilian experts. Government and public agencies are using the study’s detailed sector reports as reference materials for their work and policy engagement. There are ongoing opportunities to share and discuss recommendations and build awareness and capacity with both federal and local governments (in particular São Paulo State and São Paulo city), with public agencies (e.g. EMBRAPA, EPE, CETESB), and with private sector organizations (such as industry federations) through the joint dissemination of sectoral reports on low carbon planning.

In the course of the study, climate change gained a higher political status, the Ministry of Finance established a climate change unit and started assuming a stronger role both nationally and internationally. Various workshops were conducted during the study to foster ownership by the Government of Brazil (GoB) and its agencies and to maximize targeting and relevance of the assessment as an input to national decision processes. In addition, a series of international presentations were made, including at the international Conferences of the Parties for the UNFCCC negotiations (COP15 and COP16).

**OUTCOME:** INNOVATIVE APPROACHES & SOLUTIONS GENERATED

**INDICATOR:** NEW INNOVATIVE APPROACH DEVELOPED

With the support of ESMAP, the MACTool was produced, which builds upon the prototype of the model developed under the Brazil and Mexico Low Carbon Country Case studies and discussions with World Bank Department of Research and the office of the LAC Chief Economist. The MACTool was developed to bring to the public domain a free, user-friendly, open-code tool aimed at enabling countries to build and master their own Marginal Abatement Cost (MAC) curves, and is an economic instrument to compare low-carbon options as has been popularized by Mc Kinsey at the global level. It is now available to the Brazilian government and to several Bank teams developing new low-carbon scenarios: Colombia, Uruguay, Vietnam, Macedonia, and others.

New approaches are potentially being considered based on the conclusions of this study such as an innovative calculation tool for land use and land use change, which was specifically created for the Brazil Low-carbon Study, but which can be adapted for other countries (including deforestation).

**ESMAP ACTIVITY:** ALTERNATIVE ENERGY AND BIOENERGY (P107158)

**FISCAL YEAR:** 2009

**COUNTRY:** COLOMBIA

**OUTCOME:** POLICY/STRATEGY INFORMED

**INDICATOR:** GOVERNMENT POLICY/STRATEGY INFORMED

This activity aimed to provide advice to the Government of Colombia on the potential of alternative energy, by examining the economic dimensions of African palm oil production and the conversion of palm oil to biodiesel in Colombia, based on case study analyses undertaken in the Central and Eastern Zones. While this study does not provide definitive answers to the environmental and social implications of expanding palm oil and biodiesel production, key issues for the GoC to consider would appear to be:

1. the adoption of environmental criteria for palm production (such as voluntary certification systems),
2. Environmental and social criteria, such as approval of sustainability plans, to qualify for public support programs for palm and biodiesel, and
3. Additional analysis of land acquisition issues related to palm expansion to ensure land tenure rights of current and past tenants. Based on these case studies, the World Bank would not recommend an expansion of the biodiesel program in Colombia. This conclusion stems primarily from the economic analysis, however there are other environmental and social risks associated with biodiesel and palm oil projects that should be further examined before making a decision on expansion. There are signs that the Government may as a result of the study reduce its high target to a more realistic target for biodiesel production in Colombia.

<b>ESMAP ACTIVITY:</b> IDENTIFICATION OF POLICY OPTIONS FOR RENEWABLE ENERGY SOURCES (P108945)	
<b>FISCAL YEAR:</b> 2009	
<b>REGION/COUNTRY:</b> LAC / COLOMBIA	
<b>OUTCOME:</b> POLICY/STRATEGY INFORMED	<b>INDICATOR:</b> GOVERNMENT POLICY/STRATEGY INFORMED
<p>ESMAP's assistance to Colombia has aimed at assessing and addressing barriers to the market entry of wind energy in the country's power sector. It has been established that the single most effective policy instrument to promote wind power in Colombia is the granting of access to reliability payments, recognizing the firm energy and complementarity offered by wind. Following the advice from the ESMAP report, the Government has initiated the process to introduce the required changes in the existing regulation and it appears likely that the next bid for power additions will be done under the new regulatory framework for renewable energy. Secondly, the Government has acknowledged the gap in availability of wind resource data and is examining ways to address the problem.</p>	

<b>ESMAP ACTIVITY:</b> LOW CARBON DEVELOPMENT STUDY (P108304)																					
<b>FISCAL YEAR:</b> 2009																					
<b>COUNTRY:</b> MEXICO																					
<b>OUTCOME:</b> DEVELOPMENT FINANCING INFORMED	<b>INDICATOR:</b> PREPARATION OF NEW OPERATIONS INFORMED EXISTING OPERATIONS INFORMED																				
<p>The study evaluates the potential for GHG reduction in Mexico over the coming decades and evaluates low-carbon interventions across key emission sectors that form the basis for a low-carbon scenario to the year 2030. The study results provided the rationale for undertaking new and ongoing low-carbon investments and programs in Mexico by the Government and MDBs, including in sustainable transport, energy efficiency, and land-use management. It informed the preparation of the \$1.4 billion Green Growth Development Policy Loan (DPL) of 2009, that supported among other things a new renewable energy and energy efficiency law, the Investment Plan for the CTF program in Mexico in the areas of clean energy and sustainable transport, and the \$400 million Low-Carbon DPL in 2010 that supported policies and regulations for energy efficiency, renewable energy, urban housing, efficient vehicles, and community forestry. In addition to the DPLs, the study has influenced the design of activities under the CTF and GEF grant for energy efficiency.</p>																					
<table border="1"> <thead> <tr> <th>WB Lending Operation Informed</th> <th>Project ID</th> <th>Approval FY</th> <th>WB's total financing (US\$)</th> </tr> </thead> <tbody> <tr> <td>Mexico Framework for Green Growth Development Policy Loan</td> <td>P115608</td> <td>2010</td> <td>\$1,500</td> </tr> <tr> <td>Low Carbon Development Policy Loan</td> <td>P121800</td> <td>2011</td> <td>\$400 M</td> </tr> <tr> <td>Mexico Efficient Lighting and Appliance</td> <td>P106424</td> <td>2011</td> <td>\$251M</td> </tr> <tr> <td>GEF Wind Umbrella Project III</td> <td>P080104</td> <td>2007</td> <td>\$17,1</td> </tr> </tbody> </table>		WB Lending Operation Informed	Project ID	Approval FY	WB's total financing (US\$)	Mexico Framework for Green Growth Development Policy Loan	P115608	2010	\$1,500	Low Carbon Development Policy Loan	P121800	2011	\$400 M	Mexico Efficient Lighting and Appliance	P106424	2011	\$251M	GEF Wind Umbrella Project III	P080104	2007	\$17,1
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<b>OUTCOME:</b> POLICY/STRATEGY INFORMED	<b>INDICATOR:</b> GOVERNMENT POLICY/STRATEGY INFORMED																				
<p>The results and findings of the Mexico low-carbon study have directly contributed to Mexico's climate change program (Programa especial de cambio climatico) adopted in August 2009. The study continues to be used in Mexico and abroad as an example of a low-carbon study with a focus on near-term actions for policies and investments.</p>																					
<b>OUTCOME:</b> CLIENT CAPACITY INCREASED	<b>INDICATOR:</b> IMPLEMENTATION CAPACITY STRENGTHENED																				
<p>Support in Mexico has enhanced the capacity of the Government by: i) complementing the Government's own work on UNFCCC National Communications; ii) contributing to methodologies and tools for future mitigation actions (e.g. national appropriate mitigation actions (NAMAs); iii) Providing additional impetus for domestic mitigation programs such as bus rapid transit, residential energy efficiency, wind power development, forest management; and associated sector reforms.</p>																					

<b>ESMAP ACTIVITY: RENEWABLE ENERGY ASSISTANCE PROGRAM (P117870)</b>			
FISCAL YEAR: 2010			
COUNTRY: MEXICO			
<b>OUTCOME: DEVELOPMENT FINANCING INFORMED</b>		<b>INDICATOR: PREPARATION OF NEW OPERATIONS INFORMED</b>	
<p>Mexico's Renewable Energy Technical Assistance Program (still ongoing) is helping the GOM authorities with technical assistance, just-in time advice, and the support of high level experts, to promote and implement an effective Renewable Energy Strategy. The project informed the Mexico Low carbon DPL by proposing work on rules for renewable energy auctions for small power producers. The ESMAP TA program also provided support to the Mexican government in the definition of an administration agreement with the Ministry of Finance and the preparation of terms of reference and draft contracts related to the implementation of renewable energy activities for the GEF Wind Umbrella Project III (La Venta III).</p>			
<b>WB Lending Operation Informed</b>	<b>Project ID</b>	<b>Approval FY</b>	<b>WB's total financing (US\$)</b>
GEF Wind Umbrella Project III (La Venta III)	P080104	2007	\$17.1 M
Low Carbon Development Policy Loan	P121800	2010	\$400 M

<b>ESMAP ACTIVITY: PROMOTING MINI-HYDRO POTENTIAL (P118293)</b>	
FISCAL YEAR: 2011	
COUNTRY: MEXICO	
<b>OUTCOME: KNOWLEDGE INCREASED</b>	<b>INDICATOR: FACILITATED EXCHANGE OF BEST PRACTICE WITH CLIENTS</b>
<p>The ESMAP study built upon existing knowledge and available studies to fund pre-feasibility studies and environmental assessments of a select few pilot minihydro project sites which have already been identified as having good hydrological potential in Mexico. A workshop was held on November 18, 2009 in Mexico and aimed at sharing best practices and international experiences with the Mexican authorities. The workshop was attended by (i) members of Mexico's Ministry of Energy, (ii) the Energy Regulatory Commission, (iii) The Power Utility CFE, (iv) the Environment and Natural Resources Ministry and (v) the National Water Commission. The study provided the government with the technical data needed to assess the feasibility of developing mini hydro in Mexico.</p>	

<b>ESMAP ACTIVITY: OVERCOMING BARRIERS TO HYDROPOWER INVESTMENTS IN PERU (P109969)</b>	
FISCAL YEAR: 2009	
COUNTRY: PERU	
<b>OUTCOME: DEVELOPMENT FINANCING INFORMED</b>	<b>INDICATOR: EXISTING OPERATION INFORMED</b>
<p>With the assistance of the ESMAP SME project, enabling conditions have been established and pilot projects are in the pipeline for distribution companies over 2010-2012 to make approximately 10,000 PV based connections, with SME commercial support. These are the first PV projects in Peru to be implemented in a sustainable way by the distribution companies, using financing available under the World Bank assisted Rural Electrification Project.</p>	
<b>WB Lending Operation Informed</b>	<b>WB's total financing (US\$)</b>
Rural Electrification Project (P090116)	\$50 M
<b>OUTCOME: KNOWLEDGE INCREASED</b>	<b>INDICATOR: FACILITATED EXCHANGE OF BEST PRACTICE WITH CLIENTS</b>
<p>This ESMAP report was completed and widely disseminated to government officials and over 60 participants in workshops on the topic. The Government of Peru has increased knowledge on technical, economic and social viability of mid-scale hydropower development, as well as of the need to improve social and environmental safeguard practices, especially in the context of more politicized social environment in Peru.</p>	

<b>ESMAP ACTIVITY: SMALL HYDROPOWER (P103422)</b>	
FISCAL YEAR: 2009	
COUNTRY: PERU	
<b>OUTCOME: POLICY/STRATEGY INFORMED</b>	<b>INDICATOR: GOVERNMENT POLICY/STRATEGY INFORMED</b>
<p>This ESMAP activity supported the government of Peru in developing additional indigenous supply of electricity from small to medium scale hydropower. The activity identified that the fundamental constraint to developing Peru's hydro potential has been the low tariff faced by hydro generators, which is a consequence of the subsidies to natural gas. The ESMAP report recommended a remunerative and predictable tariff as the main ingredient to unlocking the small hydro potential in Peru. Following up on this, the Government has now decided to provide small hydro projects less than 20 MW with a premium on the tariff under a proposed new Renewable Energy Decree. This TA has helped set conditions for the first auction for renewable energy resources which was conducted in February 2010. Twenty-six projects with a total RE capacity of 411 MW, including 161 MW hydro, were awarded through this auction.</p>	

<b>ESMAP ACTIVITY: ASSESSMENT OF CLIMATE IMPACT ON PERU'S HYDROLOGY (P110305)</b>	
FISCAL YEAR: 2011	
COUNTRY: PERU	
<b>OUTCOME: KNOWLEDGE INCREASED</b>	<b>INDICATOR: DISSEMINATED BEST PRACTICES</b>
<p>This ESMAP supported study developed a methodology to allow planners and policy makers to better plan for adaptation measures to address the climate change impacts on the power and water supply sectors in Peru. The methodology assessed the hydrological impacts caused by climate change on mountain hydrology in the Andes. The report has been finalized and disseminated and the methodology developed is seen as having wide application in the region and this will be monitored, pursued.</p>	

### Middle East and North Africa Region

<b>ESMAP ACTIVITY: COMMERCIAL WIND DEVELOPMENT FRAMEWORK (P110330)</b>			
FISCAL YEAR: 2009			
COUNTRY: EGYPT			
<b>OUTCOME: DEVELOPMENT FINANCING INFORMED</b>		<b>INDICATOR: PREPARATION OF NEW OPERATIONS INFORMED</b>	
<p>In 2008, ESMAP supported the Government of Egypt's 5-year program to build 2,500 MW of commercial wind farms to be tendered as Build Own and Operate (BOO) / Independent Power Production (IPP) projects. The activity sought to foster the creation of a sustainable wind power generation market in Egypt based on commercial principles and private sector participation, through the removal of market barriers to the implementation of technically and economically feasible projects. The activity resulted in three key deliverables: a wind development plan, review of the legal framework, and draft bidding documents for wind project tendering. The activity informed the Egypt Wind Power Development Project for the development of the transmission infrastructure needed the first 250 MW BOO wind project. The activity has also helped secure the financing from the Clean Technology Fund for wind power development.</p>			
<b>WB Lending Operation Informed</b>	<b>Project ID</b>	<b>Approval FY</b>	<b>WB's total financing (US\$)</b>
Egypt Wind Power Development Project	P113416	2010	IBRD 70 million and CTF 150 million

**ESMAP ACTIVITY: LOW CARBON TRANSPORT STRATEGY – MOROCCO (P114161)**

FISCAL YEAR: 2011

COUNTRY: MOROCCO

OUTCOME: DEVELOPMENT FINANCING INFORMED

INDICATOR: PREPARATION OF NEW OPERATION INFORMED

ESMAP support through the Transport and Climate Change project has prepared the ground for a new Bank strategy for Morocco's transport sector. The study assessed of the current state of the sector and identified options to improve vehicle efficiency and reduce GHG emissions. Examples include improvements in the performance and quality of public transport; transport demand management measures; traffic management and the promotion of non-motorized modes of transport (e.g. walking and cycling). The Bank's new Country Partnership Strategy (FY10-13) provides support to Morocco to improve the efficiency of urban transport in the country's large cities. A series of DPLs are planned to: (a) reduce transport costs and improve the mobility of people and goods; (b) improve the quality and efficiency of urban transport services; and (c) mitigate greenhouse gas emissions. Transport projects include an Urban Transport Development Policy Loan (DPL) (USD 136.7 million) that supports implementation of institutional, regulatory and financial reforms and a DPL (USD 100 million) for Phase 2 of Urban transport Development is also planned for March 2013 to support continuation of reforms of the Urban Transport Sector including environmental and social aspects, and measures to reduce transport CO<sub>2</sub> emissions.

WB Lending Operation Informed	Project ID	Approval FY	Total financing (US\$)
Urban Transport Sector Development Policy Loan	P115659	2011	\$136,7 M

**ESMAP ACTIVITY: 5M-REGIONAL SOLAR POWER INITIATIVE (P113684)**

FISCAL YEAR:2009

COUNTRY: REGIONAL

OUTCOME: DEVELOPING FINANCING INFORMED

INDICATOR: PREPARATION OF NEW OPERATIONS INFORMED

The activity has enabled extensive consultations and capacity building activities in Algeria, Egypt, Jordan, Morocco, and Tunisia. The following activities have been initiated: (i) assessment of the global technology status including the thermal storage and desalination issues; (ii) economic analyses and site selection methodology; (iii) studies on local manufacturing opportunities; (iv) assessment of transmission capacity requirements; and (v) dispatch optimization assessment for integration of CSP. By undertaking these activities, ESMAP helped the countries in the region leverage resources for the feasibility and investment phases of CSP projects in Morocco, Egypt and Tunisia which are currently under preparation.

WB Lending Operation Informed	Project ID	Approval FY	WB's total financing (US\$)
Morocco: Ouarzazate Concentrated Solar Power	P122028	2012	IBRD 200 million and USD CTF 97 million USD
<i>In Pipeline</i>			
Egypt: Kom Ombo Solar Power	P120191	2012	IBRD 170 million USD loan ( <i>proposed</i> )
Tunisia-STEG Concentrated Solar Power	P122029	2012	IBRD 35 million USD loan ( <i>proposed</i> ) CTF 36 million USD

## South Asia Region

<b>ESMAP ACTIVITY: LOW CARBON GROWTH (P101555)</b> <b>FISCAL YEAR: 2007-11</b> <b>COUNTRY: INDIA</b>	
<b>OUTCOME: POLICY/STRATEGY INFORMED</b>	<b>INDICATOR: GOVERNMENT POLICY/STRATEGY INFORMED</b>
<p>One of the major policy impacts of the study was to bridge the “dialogue and knowledge gap” between national and international policy-makers. In essence, the study threw much light on what “was, is and will ever be possible” in the context of India when development and implementation constraints are objectively integrated. To Indian policy-makers, the key message was that policies are broadly in the right directions and focused attention is required on creating and enhancing conditions for successful implementation. This would require investment in regional transmission, and hydropower. To international policy-makers, the challenges are daunting and India would need more help and time than normally assumed”. As a consequence, the policy drive to develop renewables, and in particular solar technology, would require massive funding and technology transfer to be sustainable.</p>	
<b>OUTCOME: CLIENT CAPACITY INCREASED</b>	<b>INDICATOR: DESIGN CAPACITY STRENGTHENED</b>
<p>The Bank collaborated with the Government of India through its Planning Commission and other sector specialists to develop a low carbon development model, EFFECT (Energy Forecast Framework and Emission Consensus Tool) that is used planning tool to analyze key sectors of the economy and assess the impact of policy choices on greenhouse gas emission levels. This collaboration has created a platform for the Government to build consensus on development goals and mitigation options and has enabled future refinement of the model, assumptions and updates to the analysis to reflect the country’s reality.</p>	
<b>ESMAP ACTIVITY: PRIVATE RENEWABLE POWER GENERATION STUDY (P099006)</b> <b>FISCAL YEAR: 2008-2009</b> <b>COUNTRY: SRI LANKA</b>	
<b>OUTCOME: KNOWLEDGE INCREASED</b>	<b>INDICATOR: FACILITATED EXCHANGE OF BEST PRACTICE WITH CLIENTS</b>
<p>ESMAP supported a study on "Environmental Issues in the Power Sector" in Sri Lanka which focused on identifying (i) Environmental consequences of power sector in general, with particular focus on coal based power generation; (ii) Strategies for mitigating adverse environmental impacts; and (iii) Development of a Regulatory Framework for Environmental Management for the power sector in Sri Lanka.</p> <p>A Stakeholder Workshop was organized in Sri Lanka on March 6-7 2009 with the key objectives to: disseminate the findings of the study on Sri Lanka: Private Sector, Small-scale, Grid-connected Renewable Power Generation--A Review of the Past Decade; and to facilitate a consultative process and knowledge sharing among the key stakeholders on sustainable energy development through the production and use of renewable energy sources. The workshop was implemented in cooperation with the Ministry of Power and Energy (MoPE) of the Government of Sri Lanka, and other stakeholders including the Sustainable Energy Authority (SEA).</p>	
<b>ESMAP ACTIVITY: RENEWABLE ENERGY MARKET TRANSFORMATION INITIATIVE – SOUTH ASIA CONCENTRATING SOLAR POWER PROGRAM (P119536)</b> <b>FISCAL YEAR: 2011</b> <b>COUNTRY: REGIONAL</b>	
<b>OUTCOME: KNOWLEDGE INCREASED</b>	<b>INDICATOR: FACILITATED EXCHANGE OF BEST PRACTICES WITH CLIENTS</b>
<p>ESMAP’s REMTI program is supporting a three-year program 1) to facilitate deployment of and investments in CSP technologies in India; 2) to build knowledge and strengthen capacity of SA energy sector specialists and local partners in India and in the region on understanding of key technical and institutional aspects of utility-scale concentrating solar power applications; and 3) to build expertise on related project development and implementation. The first year has been complete and has contributed to knowledge increasing through a) building knowledge and understanding technology related costs and technical performance indicators in India’s context for further dissemination , b) building a technical basis for solar resource database through the evaluation of solar radiation and parallel hands-on training for scientists and specialist resources on radiation measurement techniques, and c) providing early opportunities to learn from and embrace international best practice industry</p>	



experience and academic research achievements.

## Global

**ESMAP Activity:** CLEAN ENERGY TECHNOLOGY ACCELERATION (P113329)

**FISCAL YEAR:** 2009

**REGION/COUNTRY:** GLOBAL

**OUTCOME:** POLICY/STRATEGY INFORMED

**INDICATOR:** BANK SECTOR STRATEGY INFORMED/INFLUENCED

The strategic intent of the project was to develop strategies to then be adopted by the Bank or externally. This has happened to a great extent with the vehicles and underlying strategy of tackling identified barriers being taken both inside and outside the Bank. The Regional Energy Innovation Centers have been taken up by infoDev, and much of the Technology Policy Support Program is included in what the energy anchor has been doing with the action groups on CCS, CSP and smart grids. The project's work has also fed into the new strategy for the Global Environment Facility (GEF) to support their enhanced work in pre-commercial technologies.

**ESMAP Activity:** EXPERT PANEL (P118166)

**FISCAL YEAR:** 2010

**REGION/COUNTRY:** GLOBAL

**OUTCOME:** KNOWLEDGE INCREASED

**INDICATOR:** FACILITATED EXCHANGE OF BEST PRACTICE WITH PARTNERS

The expert panel was successfully convened with a summary report that suggested various areas for ESMAP's future engagement including a more detailed look at climate vulnerability of the energy sector. The key outcome of this activity was the facilitated knowledge exchange with top climate and energy experts who provided ESMAP with feedback for future activities. The recommendations of this panel led to a new area of focus on energy and climate adaptation, in which a series of various knowledge products have been produced under a separate activity.

**ESMAP Activity:** REMTI COORDINATION & OUTREACH (P120448)

**FISCAL YEAR:** 2010

**REGION/COUNTRY:** GLOBAL

**OUTCOME:** KNOWLEDGE INCREASED

**INDICATOR:** FACILITATED EXCHANGE OF BEST PRACTICE WITH PARTNERS

Through the establishment of the Renewable Energy Market Transformation Initiative (REMTI), ESMAP aimed to improve the coordination and outreach aspects of the various renewable energy projects, to glean lessons -- on specific RE technology, policy and/or institutional framework, as well as financing aspects -- that are applicable to other developing country contexts. More specifically, this component of REMTI has focused on enhancing client country institutional capacity to develop, plan and implement strategies to accelerate deployment of select RE technologies. REMTI has partnered with the Renewable Energy & Energy Efficiency Partnership (REEEP) to create a platform for knowledge sharing, such as jointly sponsored events. This activity supported REMTI Knowledge Exchange Forum (which featured REMTI's work to support the Philippines RE Policy Reform) and knowledge products (e.g., REMTI brochure, AMC/ OBA Market Support Mechanism concept paper).

REMTI also has partnered with the Bloomberg New Energy Finance (BNEF) to expand the scope and source of knowledge related to the RE sector, to include global private sector investment trends.

**ESMAP Activity:** REMTI KNOWLEDGE EXCHANGE (GEOTHERMAL) (P120449)

**FISCAL YEAR:** 2010

**REGION/COUNTRY:** GLOBAL

**OUTCOME:** KNOWLEDGE INCREASED

**INDICATOR:** FACILITATED EXCHANGE OF BEST PRACTICE WITH CLIENTS

The overarching goal of REMTI's geothermal component is to enable low-income countries with geothermal potential to upgrade their knowledge and capabilities to enable them to scale up the development of the resource, especially for power generation. ESMAP undertook a mission to Rift Valley -- Tanzania, Uganda, Rwanda -- to assess the status of geothermal development in the sub-region, and to identify areas for potential ESMAP engagement. The mission conducted a series of consultations which helped increase knowledge on geothermal energy with various stakeholders and agree on the priority assistance areas for geothermal. Continued support and



request for assistance on Geothermal has been requested by ESMAP and a Geothermal Handbook is being prepared as a separate activity.

<b>ESMAP ACTIVITY:</b> SCALING UP DEPLOYMENT OF RE (VARIOUS) (P123069)	
<b>FISCAL YEAR:</b> 2011	
<b>REGION/COUNTRY:</b> GLOBAL	
<b>OUTCOME:</b> KNOWLEDGE INCREASED	<b>INDICATOR:</b> DISSEMINATION OF BEST PRACTICES
<p>This activity has supported development of analytical studies and data related to scaling up grid-connected RE energy in developing countries. ESMAP provided TA and studies/ reports that address issues and challenges to scaling up RE deployment. Products include knowledge products that synthesize other country experiences and key lessons learned. These knowledge products are specifically designed to facilitate dissemination of new knowledge/ technology/ best practice to broader audiences. An online report was published in October 2010 titled Best Practice Guidelines for Mesoscale Wind Mapping Projects for the World Bank. The report increased knowledge on cutting-edge innovations and best practices towards scaling up deployment of grid-connected RE and ESMAP is now considering a program for meso-scale RE resource mapping.</p>	

<b>ESMAP ACTIVITY:</b> ENERGY ADAPTATION KNOWLEDGE DISSEMINATION (P123137)	
<b>FISCAL YEAR:</b> 2011	
<b>REGION/COUNTRY:</b> GLOBAL	
<b>OUTCOME:</b> KNOWLEDGE INCREASED	<b>INDICATOR:</b> FACILITATED EXCHANGE OF BEST PRACTICE WITH PARTNERS
<p>The aim of this activity was to raise awareness of the impacts of climate change on energy sector activities and provide experts with options and experiences to raise awareness and apply lessons to their work. Two key ESMAP knowledge products were disseminated to increase knowledge – a book on “Climate Impacts on Energy Systems” and an online toolkit - HEAT (Hands-on Energy Adaptation Toolkit) were highly disseminated through BBLs, presentations (external and internal), missions, blogs and news stories as well as through training courses. These knowledge products were also presented at the UNECA conference on Africa Development Forum VII (Energy and Climate for Development) in October 2010.</p>	

<b>ESMAP ACTIVITY:</b> LOW CARBON GROWTH KNOWLEDGE PRODUCTS (P117056)	
<b>FISCAL YEAR:</b> 2010	
<b>REGION/COUNTRY:</b> GLOBAL	
<b>OUTCOME:</b> INNOVATIVE APPROACHES AND SOLUTIONS GENERATED	<b>INDICATOR:</b> NEW INNOVATIVE APPROACH DEVELOPED
<p>The Low Carbon Growth Knowledge Products and Program laid the foundation for the roll out and implementation of learning programs inside and external to the Bank on low carbon development. Together with WBI, ESMAP and the World Bank placed significant efforts on the creation of a body of knowledge drawing on the lessons, analysis and results from the ESMAP Low Carbon studies. Briefing materials, trainings and online tools have been developed. Two key innovations are the MACTool and EFFECT.</p> <p>The MACTool (Marginal Abatement Cost Tool) was produced, which builds upon the prototype of the model developed under the Brazil and Mexico Low Carbon Country Case studies and discussions with World Bank Department of Research and the office of the LAC Chief Economist. The Brazilian government is currently using MACTool to develop their local cap and trade program. Several Bank teams developing new low-carbon scenarios: Colombia, Uruguay, Vietnam, Macedonia, and others, have expressed interest in using MACTool as well. In India, the Bank collaborated with the Government of India through its Planning Commission and other sector specialists to develop a low carbon development model, EFFECT (Energy Forecast Framework and Emission Consensus Tool) which is an open tool for forecasting green house gas emissions from low carbon development scenarios. Since then, EFFECT has been implemented in 11 countries and 9 different cities. In Poland, it catalyzed the work on renewable energy and energy efficiency. In Georgia, it has been used to develop a green transportation strategy as championed by the Ministry of Economy and Sustainable Development in order to reduce fuel imports. In Nigeria, the Energy Commission created an EFFECT modeling group within its Energy Planning and Analysis group in order to investigate generation options for a thirty-year time horizon.</p>	

## Clean Energy Activities with Limited or Unobservable Results

### ESMAP ACTIVITY: REHABILITATION OF HYDROPOWER INFRASTRUCTURE (P103265)

FISCAL YEAR: 2009

COUNTRY / REGION: GLOBAL/ENVIRONMENT ANCHOR

This is a combined ESMAP and Water Anchor knowledge product for FY2009 on the Rehabilitation of Hydropower Infrastructure as part of the Water for Energy hydropower studies. Specific impacts directly linked to this project have not been identified.

### ESMAP ACTIVITY: CARBON ACCOUNTING (P113561)

FISCAL YEAR: 2011

REGION/COUNTRY: GLOBAL/ENERGY ANCHOR

The objective of this activity was to provide background information around coal power generation including aspects of energy supply security, current technologies, expected technological advances and economic development; tools for evaluating coal power projects with alternatives on parameters like environmental impact, social effects, risk management; and energy and environmental policy and regulations relevant to coal power. No specific results directly linked to this project have been identified at this time.

### ESMAP ACTIVITY: SOUTH EASTERN EUROPE REGIONAL ENERGY EFFICIENCY AND RENEWABLE ENERGY (P110548)

FISCAL YEAR: 2009

COUNTRY: REGIONAL

ESMAP supported a report focused on improving energy efficiency in the Western Balkans countries. The report has been produced highlighting status for Energy Efficiency and options for improvements in the Western Balkans countries. The report will serve as a useful guidance for countries in the Region that want to take concrete steps to improve their EE performance. The report was disseminated to relevant stakeholders in each country by the respective World Bank country offices, however, no specific impacts or results directly linked to this project have been identified.

### ESMAP ACTIVITY: CSP: REGULATORY AND FINANCIAL INCENTIVES (P118730)

FISCAL YEAR: 2011

REGION/COUNTRY: GLOBAL / ENERGY ANCHOR

Various workshops have been organized to enhance client's institutional capacity and facilitate knowledge about deployment of utility-scale concentrating solar power (CSP) in developing partner countries through information exchange and sharing, operational and policy response assistance, and expert capacity building. There is also outreach for disseminating this knowledge within the Bank's regional CSP programs. Identifying specific outcomes is still premature for this project.

### ESMAP ACTIVITY: REGIONAL COOPERATION TO REMOVING TECHNICAL BARRIERS TO SUSTAINABLE HYDROPOWER DEVELOPMENT IN SOUTH ASIA (P120452)

FISCAL YEAR: 2010

COUNTRY: REGIONAL

ESMAP supported the study on Regional Cooperation to Reducing Barriers to Sustainable Hydropower Development in South Asia which identified and documented the emerging good practices in the region on tunnel construction, geotechnical aspects and sediment management. The study also undertook a gap analysis in order to compare current practices in the region with international practices from other regions to help identify areas/practices where improvements or changes could be implemented. Furthermore, analysis was successfully done on the identification of barriers to advancing relevant practices in the region and outlined recommendations on how to remove/mitigate those barriers. The research in the report has led to related work on tunneling issues is being explored such as the tunnel boring machine and other modern tunneling technology. Specific impacts directly linked to this project have not been identified.

**ESMAP ACTIVITY: REMTI - KNOWLEDGE EXCHANGE ACTIVITIES (P123072)**

**FISCAL YEAR: 2010**

**REGION/COUNTRY: GLOBAL**

This activity focused on disseminating ESMAP knowledge and to exchange products with various partners and stakeholders regarding RE technology deployment in client countries. The large objective of knowledge dissemination and exchange has been achieved, through support not only from ESMAP but from other donor funding that supported this activity. ESMAP facilitated knowledge promotion in several ways, by holding workshops for clients and other stakeholders (government officials, utilities, regulators, project developers, private sector investors) as well as participating in major international fora. No direct outcomes have been identified at this point.

**ESMAP ACTIVITY: PROMOTION OF RENEWABLE ENERGY (P107150)**

**FISCAL YEAR: 2009**

**REGION/COUNTRY: MNA/IRAN**

The ESMAP-funded Islamic Republic of Iran Power Sector Note found that Iran has a large potential for hydropower generation, estimated at about 50 billion kWh/year. The study helped the Government in: (a) designing a policy to ensure the implementation of economically viable hydro projects which are not able to compete commercially with the fossil-fuel- based electricity generation, due to very low and subsidized gas price; (b) formulating a program of other renewables, particularly wind and solar energy; and (c) preparing an agenda and list of possible priority projects for investment including possible funding from GEF). Since the team had a ban on travel to Iran, they conducted a desk update of the study in June 2010 to reflect developments and lessons learned from the Bank activities in MENA region and internationally during FY2010. Further, since the Bank has no program in the energy sector in Iran since June 2009 it has no influence over the interpretation and implementation of measures proposed in the report.

**ESMAP ACTIVITY: RENEWABLE ENERGY INVESTMENT CLIMATE ASSESSMENT (P099005)**

**FISCAL YEAR: 2011**

**COUNTRY: INDIA**

The ESMAP report has been finalized and published in 2010, "Unleashing the Potential of Renewable Energy in India." The study effectively set out the concepts for improving risk and reward allocations under the existing regulatory framework. It sets out three models that attempt to capture the range of regulatory approaches seen across states in India. By doing so - it created a framework to enable discussions to take place between state regulators. A number of models (anchored in real projects) were developed to bring in the private sector. These were successfully road tested at a conference held for the private sector but no specific outcomes have been identified at this point.

### Ongoing Clean Energy Activities

**ESMAP ACTIVITY: URBAN TRANSPORT CLIMATE CHANGE STRATEGY (P117917)**

**FISCAL YEAR: 2011**

**REGION/COUNTRY: EAP/CHINA**

The aim of this ESMAP supported activity is to effectively promote a national urban public transport development strategy aimed at slowing the growth in transport GHG emissions, improving urban air quality, and providing better transport services for the vast majority of urban dwellers who don't own a car. Tools and approaches to use the latest spatial mapping techniques for urban transport planners and decision-makers have been identified and are being documented for adoption and dissemination. The next steps will be to disseminate this knowledge product at a final workshop and contribute this work towards a series of case studies helping decision makers and Bank TTLs understand and use the tools created and well as have input into a forthcoming publication on Low Carbon Cities.

**ESMAP ACTIVITY: GEOTHERMAL DIARIES: THE JOURNEY OF DEVELOPING THE ULUBELU AND LAHEHDONG FIELDS (P115745)**

FISCAL YEAR: 2011

REGION/COUNTRY: EAP/INDONESIA

The objective of the ESMAP-funded activity is to draw on experiences from the preparation of the Ulubelu and Lahendong geothermal projects in Indonesia to inform good practices for geothermal development around the world. This will be achieved by focusing on lessons learned during the preparation of the project, highlighting the most important issues that emerged, and presenting analytical work that was carried out and novel approaches applied to address these issues in order to meet industry standards and improve PGE's practices. This work will feed into ongoing World Bank engagement of supporting the Government of Indonesia in preparing to tap its vast geothermal resources to fuel a growing economy and address environmental concerns.

**ESMAP ACTIVITY: RENEWABLE ENERGY LEGAL AND REGULATORY FRAMEWORK HARMONIZATION WITH THE EU (P108023)**

FISCAL YEAR: 2009

REGION/COUNTRY: ECA/BELARUS

The objective of this activity is to advise the Government of Belarus on harmonization of the Belarus legal and regulatory frameworks, as well as technical standards and requirements, regarding renewable energy and that of the European Union. The activity is ongoing with a report being prepared for the government.

**ESMAP ACTIVITY: LOW CARBON PATH (P121716)**

FISCAL YEAR: 2010

REGION/COUNTRY: ECA/SERBIA

This is a new activity with a World Bank mission conducted in December 2011 to discuss Analytic and Advisory support in the energy efficiency field financed by ESMAP.

**ESMAP ACTIVITY: CLIMATE CHANGE – ENERGY VULNERABILITY (P113712)**

FISCAL YEAR: 2009

REGION/COUNTRY: ECA/UZBEKISTAN

The project will: (i) screen the energy sector in select ECA countries to identify and prioritize hazards and vulnerabilities to projected climate scenarios (2030-50); (ii) identify options for adaptation to reduce overall vulnerability; (iii) to the extent possible look at the costs and benefits of adaptation options. The screening exercise will be conducted jointly with key energy sector stakeholders (Government, public and private sector participants in the energy sector). While the assessment will be subjective it has the advantages of providing a transparent and semi-empirical analysis of options. Initially one country in each of two sub-regions - SEE and South Caucasus - will be targeted and country selection will be based on the outcome of the regional study on Managing Uncertainty.

**ESMAP ACTIVITY: PILOT PROGRAM FOR CLIMATE ADAPTATION (P096390)**

FISCAL YEAR: 2009

REGION/COUNTRY: ECA/REGIONAL

This activity is ongoing with activities including targeted reviews of climate change impacts and adaptation strategies for vulnerable sub-sectors in vulnerable sub-regions of ECA and supporting studies and analysis that will be reviewed and discussed during regional workshops to help the Bank and client countries development strategies for further mainstreaming of climate adaptation into Bank lending and sector work.

**ESMAP ACTIVITY: CLIMATE FRIENDLY ENERGY EFFICIENCY POLICIES ACROSS SOUTH EAST EUROPE BY MEANS OF LEARNING AND CAPACITY BUILDING PROGRAM (P115996)**

FISCAL YEAR: 2009

REGION/COUNTRY: ECA/REGIONAL

This is an ongoing activity with the primary goal of the proposed program is to "help develop and/or scale up of climate-friendly energy efficiency policies across South East Europe by means of a comprehensive learning and capacity building program for stakeholder groups in different energy efficient sectors". This goal translates into the following sub-objectives: i) identify gaps in capacity and knowledge among different stakeholders, which are hindering promotion of energy efficiency policies and programs; ii) develop and deliver appropriate learning packages that directly address the identified gaps; iii) partner with regional/national organizations to develop them into regional hubs, which can sustain the learning programs beyond the duration of the proposed program.

**ESMAP ACTIVITY: CENTRAL AMERICA PROGRAMMATIC STUDY V: PROMOTING GEOTHERMAL ENERGY (P118280)**

**FISCAL YEAR: 2009**

**REGION/COUNTRY: LAC/REGIONAL**

This activity is ongoing to be delivered to the client in 2012. The Programmatic Study on the Energy Sector in Central America was conceived to formulate a strategic approach to addressing key energy sector issues faced in the region, with an emphasis on the power sector. Four modules are currently being developed, including a general issues (also known as the "umbrella") module, a short-term measures module, a regulation module, and a renewable energy module. The proposed project on promoting geothermal energy would constitute another module within the Programmatic Study. It would build upon the knowledge obtained in the renewable energy module and address the issues related to geothermal energy development in greater depth.

**ESMAP ACTIVITY: RENEWABLE ENERGY FRAMEWORK (P122591)**

**FISCAL YEAR: 2011**

**REGION/COUNTRY: MNA/YEMEN**

The objective of the proposed activity is two-fold: (i) to support the Government of Yemen develop policies and key contractual framework, adapted to the local context of Yemen, for successful commercial wind project implementation; and (ii) to build the capacity of relevant government officials in the successful implementation of wind programs. The delivery to the client has been updated to October 2012.

**ESMAP ACTIVITY: LOW CARBON DEVELOPMENT IN POWER SECTOR (P121622)**

**FISCAL YEAR: 2010**

**REGION/COUNTRY: GLOBAL / ENERGY ANCHOR**

This activity is ongoing with a toolkit being developed of analytical instruments and methodologies to facilitate low carbon development in electricity sector in the developing countries. Delivery to the client is planned for June 2012.

**ESMAP ACTIVITY: REVIEW DESIGN PERFORMANCE RE POLICY (P122077)**

**FISCAL YEAR: 2011**

**COUNTRY / REGION: GLOBAL/ENERGY ANCHOR**

The objective is to analyze the experience with the design, implementation and performance of policy instruments aimed at promoting the development of RE in selected developing countries and a thorough cross-country analysis to identify lessons learned and best practices.

**ESMAP ACTIVITY: ENERGY ADAPTATION COUNTRY BRIEFS (P123139)**

**FISCAL YEAR: 2011**

**REGION/COUNTRY: GLOBAL/ESMAP**

This ESMAP activity is ongoing and aims to develop an approach jointly with the World Bank's Climate Change team and in consultation with key energy stakeholders to develop a screening tool of potential climate stressors for the energy sector, by identifying current and potential climate risks and energy sector vulnerabilities, as well as potential adaptation options. The approach will be applied in 3 countries with outputs presented in a synthesized form through a standardized dashboard and tailored country briefing notes that will be later used by the WB Climate change team to prepare online versions within the Climate Change Knowledge Portal. The operational tool will be structured for possible further development as an online automated tool that help a country/ project screen for and identify potential vulnerable energy assets.

**ESMAP ACTIVITY: GEOTHERMAL HANDBOOK (P125368)**

**FISCAL YEAR: 2011**

**REGION/COUNTRY: GLOBAL/ESMAP**

ESMAP has supported the development of the Geothermal Handbook which is dedicated to geothermal energy as a primary source for electricity production and aims to provide energy investment practitioners with practical advice on how to set up, design, and implement a geothermal development program. The World Bank has supported geothermal development in Europe, Asia, Latin America, and Africa and hopes to contribute with this handbook to scaling up the use of this energy. This study is ongoing to be finalized and disseminated in 2012.

**ESMAP ACTIVITY:** TRANSPORT & CLIMATE CHANGE (P113671)

**FISCAL YEAR:** 2009

**REGION/COUNTRY:** GLOBAL/TRANSPORT ANCHOR

This activity is ongoing with a report being produced for publication and dissemination on integration of climate change issues in the transport sector over the short, medium and long term. The report focuses on the review of the evidence on the contribution of the transport sector to climate change in the course of development, including policy options and an analysis of barriers to reduce the energy and carbon intensity of the transport sector.

## ANNEX 2 | SUMMARY OF ESMAP ACTIVITIES BY OUTCOME TYPE

The following pages provide templates listing all ESMAP activities by country, region and project ID under each of the four themes. There are five columns, one for each of the outcomes shown below. The number on each box refers to the specific indicator related to the outcome. For example, a number 1.1 on the “Development Financing Informed” column corresponds to indicator 1.1 (Preparation of new preparation informed) under outcome 1 (Development Financing Informed).

### 1. Development Financing Informed

- 1.1 Preparation of new operation informed
- 1.2 Existing operations informed
- 1.3 Mobilization of non-Bank resources informed
- 1.4 Government expenditure informed

### 4. Knowledge Increased

- 4.1 Facilitated exchange of best practice with clients
- 4.2 Facilitated exchange of best practice with partners
- 4.3 Disseminated best practices

### 2. Policy/strategy Informed

- 2.1 Government policy/strategy informed
- 2.2 Public debate stimulated/initiated
- 2.3 Contributed to stakeholder involvement
- 2.4 Dev’t community/partner policy/strategy informed
- 2.5 Bank country strategy (CAS/CPS) informed/influenced
- 2.6 Bank sector strategy informed/influenced

### 5. Innovative Approaches & Solutions Generated

- 5.1 New innovative approach fostered
- 5.2 New innovative approach developed
- 5.3 Client is able to adopt/harness new technologies, innovative ideas, know-how

### 3. Client Capacity Increased

- 3.1 Design capacity increased
- 3.2 Implementation capacity strengthened
- 3.3 Monitoring & Evaluation capacity increased
- 3.4 Clients are recognized with good practice awards



1. ENERGY ASSESSMENTS AND STRATEGY PROGRAMS (EASP)

Country	Region	Project ID	ESMAP Activity Title	1. Development Financing Informed	2. Policy/Strategy Informed	3. Client Capacity Increased	4. Knowledge Increased	5. Innovative approaches & solutions generated	Project Status	Notes	Allocation	Disbursed
Africa	AFR	PI09447	Institutional Framework Dev & Cap. Bldg			3.2			Completed		\$ 90,000	\$ 38,673
Africa	AFR	PI10294	Sub-Saharan Africa Refinery Study		2.3				Completed		\$ 540,000	\$ 445,030
Africa	AFR	PI11483	Regulating Elec. Trading in SADC			3.1			Completed		\$ 291,686	\$ 291,686
Africa	AFR	PI14643	WAPP Broadband Program Assessment		2.1				Completed		\$ 345,000	\$ 288,006
Southern	AFR	P099315	Indicative Gen & Transm Expans	1.2					Completed		\$ 913,176	\$ 1,125,302
Djibouti	AFR	PI07067	Energy Sector Master Plan		2.1				Completed		\$ 190,001	\$ 134,841
EAP	EAP	PI03315	Regional Energy Study		2.6				Completed		\$ 225,000	\$ 168,277
China	EAP	PI06041	Generation, Pricing, Trading and Dispatch					5.2	Completed		#N/A	#N/A
EAP	EAP	PI15088	Impact of Credit Crisis --Energy Sector	1.1					Completed		\$ 90,000	\$ 89,852
Mekong	EAP	PI14377	GMS Power Trade: Policy Support			3.1			Completed		\$ 180,000	\$ 150,545
Vietnam	EAP	PI11444	Gas Sector Development Framework	1.1					Completed		\$ 74,726	\$ 74,726
Vietnam	EAP	P082155	Vietnam Gas Master Plan	1.1	2.1				Completed		\$ 80,000	\$ 79,458
Vietnam	EAP	PI19344	Vietnam Financial Impact Assessment 2			3.2			Completed		\$ 70,000	\$ 68,711
Armenia	ECA	PI16748	ELECTRICITY SUPPLY RELIABILITY	1.2					Ongoing	Ongoing w/ results	\$ 100,000	\$ 97,680
Hungary	ECA	PI10874	SMART METERING		2.1				Completed		\$ 112,638	\$ 86,429
ECA	ECA	PI12754	DISTRICT HEATING AAA - BELARUS & UKRAINE	1.2					Ongoing	Ongoing w/ results	\$ 115,000	\$ 101,712
SEE	ECA	PI12423	SEE Wholesale Market Opening	1.1	2.1				Completed		\$ 356,000	\$ 355,677
Turkey	ECA	PI05103	SUPPORTING ELECTRICITY MARKET OPER	1.1		3.2		5.2	Completed		\$ 550,000	\$ 596,513
Turkey	ECA	PI14634	CAPACITY BUILDING FOR ELECTRICITY MARKET	1.1					Completed		\$ 431,500	\$ 323,690
Ukraine	ECA	PI05332	THERMAL POWER PLANT REHAB		2.1				Completed		\$ 150,000	\$ 104,948
LCR	LCR	PI10201	60(CCH) Program. Energy Study		2.6				Completed		\$ 514,349	\$ 479,766
Peru	LCR	PI11012	Natural Gas Study		2.1				Completed		\$ 100,000	\$ 99,326
LCR	LCR	PI18014	Impact of Credit Crisis on Energy in LAC	1.1					Completed		\$ 120,000	\$ 74,097
Egypt	MNA	PI04888	Design of Load Mgt Program	1.1					Completed		\$ 390,000	\$ 250,824
Egypt	MNA	PI07068	Energy Pricing Strategy	1.1	2.1				Completed		\$ 592,378	\$ 464,047
MNA	MNA	PI06446	Maghreb Energy Market Study	1.1	2.6				Completed		\$ 75,000	\$ 65,705
MNA	MNA	PI16206	Assessment of Energy Sect. Credit Constraints	1.1					Completed		\$ 80,000	\$ 69,906
Morocco	MNA	PI08120	Energy Supply Strategy	1.1					Completed		\$ 185,000	\$ 184,524
Morocco	MNA	PI04087	Structuring New Energy Agency	1.2	2.1				Completed		\$ 210,000	\$ 162,209
Syria	MNA	PI10581	Electricity Sector Strategy		2.1				Completed		\$ 289,000	\$ 241,991
Tunisia	MNA	PI04800	Review of Energy Mgt Policy	1.1					Completed		\$ 480,000	\$ 456,617
India	SAR	PI05191	Coal Fired Generation - Energy Eff. Impr	1.1	2.1	3.2			Completed		\$ 635,306	\$ 464,811
India	SAR	PI05194	Regulatory and Planning Requirement for Rehabilitation of Coal Fired Generation	1.1					Completed		\$ 312,337	\$ 291,422
India	SAR	PI11243	Org Trans & PPPs in MSETCL	1.1		3.2			Completed		\$ 306,250	\$ 209,918
India	SAR	PI22931	Power Sector Stocktaking		2.1				Ongoing	Ongoing w/ results	\$ 366,447	\$ 187,741
Nepal	SAR	PI22960	Support to Strategic Energy Sector De	1.1					Ongoing	Ongoing w/ results	\$ 147,000	\$ 131,515
Sri Lanka	SAR	PI11245	Environmentally Sustainable Power Dev.			3.1	4.1		Completed		\$ 244,000	\$ 206,577
South Asia	SAR	PI20567	SAR Energy Sect. Vulnerability Assessment		2.6				Ongoing	Ongoing w/ results	\$ 183,831	\$ 161,521
GLOBAL	Global	PI18729	Electricity Transmission planning		2.1		4.1		Ongoing	Ongoing w/ results	\$ 147,347	\$ 118,476
GLOBAL	Global	PI13129	Power Sector Market Structure				4.3		Ongoing	Ongoing w/ results	\$ 200,000	\$ 180,862
GLOBAL	Global	PI09169	NOCs Case Studies		2.1				Ongoing	Ongoing w/ results	\$ 300,000	\$ 291,113
GLOBAL	Global	PI20423	Private and Public Sector Roles		2.6				Ongoing	Ongoing w/ results	\$ 200,000	\$ 185,143

LIST OF EASP ACTIVITIES CONTINUES ON THE NEXT PAGE.

Africa	AFR	P09257	Oil Supply Log. & Security for Small Oil-Importing Afr. Countries							Completed	No Observable results	\$ 110,000
Africa	AFR	P109700	SSA Downstream Petroleum Efficiency Study							Completed	No Observable results	\$ 250,000
Mongolia	EAP	P119796	Diagnostic of Econ Crisis to Infrastr							Completed	No Observable results	\$ 35,000
Montenegro	ECA	P112552	PPP Options for Electricity Generation							Completed	No Observable results	\$ 111,206
ECA	ECA	P118724	IMPACT OF FINANCIAL CRISIS ON POWER SECT							Completed	No Observable results	\$ 135,000
LCR	LCR	P113882	EAP - Phase II (Energy, Env. & Population)							Completed	No Observable results	\$ 473,500
LCR	LCR	P112430	Energy Procurement & Auctions							Completed	No Observable results	\$ 270,810
LCR	LCR	P114009	Electricity Security							Completed	No Observable results	\$ 280,000
MNA	MNA	P111861	R/D/GCC Electricity Trade & Intercon							Completed	No Observable results	\$ 85,000
MNA	MNA	P113903	Energy Integration Study							Completed	No Observable results	\$ 132,406
MNA	MNA	P116216	Maghreb-Vulnerability Assessment-MA & TN							Completed	No Observable results	\$ 80,000
Iran	MNA	P106901	Electricity Pricing & Power Sector Reform							Completed	No Observable results	\$ 152,676
West Bank	MNA	P110209	Transport Sector TA							Completed	No Observable results	\$ 89,703
GLOBAL	Global	P116253	Global Energy Assessment: Capacity Build							Completed	No Observable results	\$ 350,000
GLOBAL	Global	P110342	GEA background energy papers							Completed	No Observable results	\$ 198,200
GLOBAL	Global	P110522	Fuel Price Risk & Power Systems Planning							Completed	No Observable results	\$ 130,000
GLOBAL	Global	P108579	Regional Power Trade Study							Completed	No Observable results	\$ 320,992
Vietnam	EAP	P113836	VN-FY09 Cluster Infra Policy/Regu Reform							Ongoing		\$ 170,000
Caucasus	ECA	P122951	Regional Energy Sector Note							Ongoing		\$ 225,000
ECA	ECA	P118225	Energy Trade in the Black Sea Region							Ongoing		\$ 50,000
Uzbekistan	ECA	P122927	UAP-ES ASSESSMENT							Ongoing		\$ 100,000
LCR	LCR	P122936	CA Prog. Study 6: energy diversification							Ongoing		\$ 210,400
LCR	LCR	P119291	Impact of High and Volatile Oil Prices							Ongoing		\$ 335,596
Jordan	MNA	P110853	Energy Sector TA							Ongoing		\$ 175,100
Egypt	MNA	P121712	Cairo Congestion Study							Ongoing		\$ 70,000
MNA	MNA	P122363	5M-AWI Electricity Networks Integration							Ongoing		\$ 183,500
India	SAR	P102843	Luhri Hydro Electric Project							Ongoing		\$ 150,000
Maldives	SAR	P123047	Developing a Regulatory Framework							Ongoing		\$ 200,000
South Asia	SAR	P122369	South Asia Reg. Energy Studi. Series							Ongoing		\$ 350,000
GLOBAL	Global	P121518	Flagship Electricity Tech. Options Assessment							Ongoing		\$ 800,000
		72		21	20	8	3	2				

## 2. ENERGY ACCESS (EA)

Country	Region	Project ID	ESMAP Activity Title	1. Development Financing Informed	2. Policy/strategy Informed	3. Client Capacity Increased	4. Knowledge Increased	5. Innovative approaches & solutions generated	Project Status	Notes	Grant allocated	Grant disbursed
Africa	AFR	P103456	3A-ESMAP Implement Action Plan (FY09)		2.2 // 2.6				Completed		\$ 1,484,544	\$ 1,412,609
Africa	AFR	P109027	Solar Lantern Testing & Certification					5.2	Completed		\$ 140,000	\$ 203,836
Africa	AFR	P113808	LA Dev. Mikplace Awardees Supervision			3.2			Completed		\$ 525,000	\$ 210,176
Africa	AFR	P116277	Task 2: Lighting Africa-2010 Conference					5.2	Completed		\$ 256,922	\$ 256,922
Africa	AFR	P116289	Task 3: IA Market Dev. and OA			3.2			Completed		\$ 1,942,292	\$ 1,784,292
Africa	AFR	P116908	3A- Gender and Energy P116908	1.1 // 1.3					Completed		\$ 1,500,000	\$ 527,082
Africa	AFR	P106178	3A-ESMAP Lighting Africa		2.1 // 2.4			5.2	Ongoing	Ongoing w/ results	\$ 100,000	\$ 502,750
Africa	AFR	P107546	RW&KE- ESMAP SWAP Investment & Policy	1.1 // 1.3	2.5				Ongoing	Ongoing w/ results	\$ 2,000,000	\$ 1,178,042
Africa	AFR	P110999	3A-ESMAP Afr. Electrification Experience				4.1		Ongoing	Ongoing w/ results	\$ 1,200,000	\$ 1,192,019
Africa	AFR	P116419	Biomass Energy Initiative	1.1 // 1.3					Ongoing	Ongoing w/ results	\$ 2,115,000	\$ 1,479,397
Africa	AFR	P120478	3A- Renewable Energy Education Project			3.2			Ongoing	Ongoing w/ results	\$ 175,000	\$ 38,449
Burkina Faso	AFR	P107574	BF-ESMAP Capacity Building (FY09)	1.2					Completed		\$ 106,031	\$ 23,900
Cameroun	AFR	P107606	GM-ESMAP Cap Bldg Small Scale (FY09)	1.1					Completed		\$ 108,000	\$ 107,721
Guinea	AFR	P108841	GN-ESMAP SMEs in Rural Electr. (FY10)		2.1				Completed		\$ 100,000	\$ 115,356
Liberia	AFR	P118460	AFREA - Uberia Rural Energy (Phase 1)	1.3		3.2			Completed	From lending from EU	\$ 1,481,387	\$ 1,435,475
Rwanda	AFR	P097818	RW - Sustainable Energy Dev. Proj (GEF)		2.1				Ongoing	Ongoing w/ results	\$ 200,000	\$ 161,432
Tanzania	AFR	P107301	TZ-ESMAP Integrating SME in Rural (FY10)		2.1		5.2		Completed		\$ 32,500	\$ 143,999
Tanzania	AFR	P117260	TZ-Additional Financing - TEDAP	1.2					Ongoing	Ongoing w/ results	\$ 100,000	\$ 97,727
Cambodia	EAP	P095219	ESMAP-Decentralized Energy Services	1.2					Completed		\$ 796,704	\$ 752,922
Mongolia	EAP	P099764	Mongolia - rural energy project			3.2			Completed		\$ 55,000	\$ 55,000
Lao Peoples De	EAP	P120983	Stimulating SME for Productive Use of EI	1.1		3.2			Ongoing	Ongoing w/ results	\$ 250,000	\$ 182,333
Lao	EAP	P107193	LAO SMEs in Decentralized Egv. Serv	1.2					Completed		\$ 261,925	\$ 261,925
Bolivia	LCR	P105119	BO Strengthening Small Scale Offgrid	1.2 // 1.3					Completed		\$ 277,613	\$ 277,613
Bolivia	LCR	IFCSME	Off-grid rural electrification SME Program			3.2			Completed		\$ -	\$ -
Central America	LCR	P124390	CA Improved Cook Stove Framework	1.3					Ongoing	Ongoing w/ results	\$ 166,339	\$ 94,804
Haiti	LCR	P125192	HT TA household and other energy sector	1.1					Ongoing	Ongoing w/ results	\$ 250,000	\$ 123,666
Haiti	LCR	P103968	HT-Woodfuels: Promoting Efficient Stoves	1.1	2.1				Completed		\$ 451,891	\$ 451,891
Latin America	LCR	P120429	Joint InfoDev/ESMAP SME Assessment		2.4				Completed		\$ 30,000	\$ 27,187
Latin America	LCR	P110668	6L-Benchmarking of Electricity Distrib		2.1		4.1		Completed		\$ 120,000	\$ 118,113
Nicaragua	LCR	P103865	NI-Improv. Small-Scale Egv. Supply		2.1				Completed		\$ 216,512	\$ 216,512
Peru	LCR	P104354	SMEs Energy Services Delivery in Peru	1.2	2.1				Completed		\$ 373,580	\$ 373,580
Peru	LCR	P123643	Promotion Productive Uses Electricity	1.2		3.2			Ongoing	Ongoing w/ results	\$ 231,596	\$ 152,518
Bangladesh	SAR	P083898	BD Addressing IAP				4.1		Completed		\$ 180,000	\$ 104,025
Nepal	SAR	P111242	Assess. Social Impacts of Rural Energy P111242			3.3			Completed		\$ 201,000	\$ 209,380
Global	Global	P095153	Decentralized EGV SERV (Haiti-Recon. mission)	1.1					Completed		\$ 890,000	\$ 790,218
Global	Global	P104135	Work on Gender and Youth in EI P104135	1.1 // 1.2	2.5				Completed		\$ 256,000	\$ 273,003
Global	Global	P111786	Gender and Energy GAP		2.3				Completed		\$ 63,587	\$ 37,120
Global	Global	P112370	Modernizing Energy Services for the Poor		2.6				Completed		\$ 51,453	\$ 51,453
Global	Global	P119673	Gender & Energy Dev.			3.2			Completed		\$ 257,245	\$ 211,449
Global	Global	P121383	Household Energy Access: Lessons Learned		2.6				Completed		\$ 65,000	\$ 47,800
Global	Global	P109952	Gender and Energy		2.6				Completed		\$ 132,568	\$ 132,568
Global	Global	P123004	GEDS Program P123004	1.1 // 1.3		3.2			Ongoing	Ongoing w/ results	\$ 258,000	\$ 200,440

LIST OF EA ACTIVITIES CONTINUES ON THE NEXT PAGE.

Africa	AFR	P118980	Decision Tool - PV for Community Service						Completed	No Observable results	\$ 360,000	\$ 258,615
South Eastern E	ECA	P111466	Econ of Connecting Poor to Natural Gas						Completed	No Observable results	\$ 50,000	\$ 49,894
Latin America	LCR	P110667	Mechanisms for Reaching the Poor in INF						Completed	No Observable results	\$ 115,000	\$ 114,448
MNA	MNA	P116227	Economic Benefits of Electricity Supply						Completed	No Observable results	\$ 100,500	\$ 90,763
Global	Global	P111450	Evaluation of Rural Electrification P111450						Completed	No Observable results	\$ 502,000	\$ 396,877
Africa	AFR	P108860	Id. and Testing of Inputs for Enhanced Elec. Access Package						Ongoing		\$ 310,000	\$ 286,273
Benin	AFR	P110075	Modernizing Biomass Energy Services in Benin						Ongoing		\$ 200,000	\$ 205,23
Liberia	AFR	P118439	Catalyzing New RE in Rural Liberia (Phase2)						Ongoing		\$ 2,000,000	\$ 385,885
Mali	AFR	P073036	ML-Household Energy & Univ Access (FY04)						Ongoing		\$ 200,000	\$ 198,704
Nigeria	AFR	P117818	Enhancing the Climate Resilience of Grow						Ongoing		\$ 335,000	\$ 122,997
India	SAR	P122107	Direct Delivery of Power Subsidy to Agri						Ongoing		\$ 410,000	\$ 200,617
Global	Global	P114371	Review of strategies for fuelwood						Ongoing		\$ 150,000	\$ 149,613
Global	Global	P120447	ESMED Egy Access for Urban Poor - CA/IFC						Ongoing		\$ 1,297,800	\$ 856,162
		55		24	17	11	3				\$ 25,432,989	\$ 19,148,075

### 3. ENERGY EFFICIENCY

Country	Region	Project ID	Title	1. Development Financing Informed	2. Policy/strategy informed	3. Client Capacity Increase	4. Knowledge Increase	5. Innovative approaches & solutions generated	Project Status	Notes	Grant allocation	Disbursement
AFR	AFR	P113599	LED Lights Quick Screening Methodology					5.2, 5.3	Completed		\$ 153,185	\$ 153,185
China	EAP	P099544	China Energy Intensity Strategy	1.1	2.1	3.1			Completed		\$ 445,000	\$ 349,550
China	EAP	P111927	Survey and Knowledge-Sharing on Egy Con	1.2					Completed		\$ 80,000	\$ 75,829
EAP	EAP	P121572	Resilient Cities: Decision Support Tools	1.3					Completed	\$450K USAid	\$ 46,534	\$ 46,534
Moldova	ECA	P113570	District Heating and Electricity Restructuring		2.1				Completed		\$ 80,000	\$ 58,276
Chile	LCR	P112532	National Energy Efficiency Program			3.2			Completed		\$ 90,000	\$ 86,766
Lebanon	MNA	P113858	Support to Impl of Electricity Sect		2.1				Completed		\$ 60,000	\$ 53,415
Morocco	MNA	P101264	Transport and Energy Efficiency	1.1	2.5				Completed		\$ 109,904	\$ 109,496
Yemen	MNA	P114431	Institutional Framework for Energy Efficiency		2.1				Completed		\$ 100,000	\$ 47,715
Bangladesh	SA	P111240	Energy Efficiency & Clean Tech in Brick Sector	1.2	2.1			5.2	Completed		\$ 220,000	\$ 234,699
Pakistan	SA	P111246	Large-Scale Efficient Lighting Progr.	1.2					Completed		\$ 120,000	\$ 40,590
GLOBAL	GLOBAL	P114056	Mainstreaming Building EE Codes in Developing Ct	1.1					Completed	exclude inc capacity	\$ 286,390	\$ 244,142
GLOBAL	GLOBAL	P114245	Energy Efficient Cities Practitioners Workshop		2.6				Completed		\$ 150,000	\$ 130,074
GLOBAL	GLOBAL	P114361	Operational Toolkit for En Eff Lighting	1.1				5.1	Completed		\$ 165,000	\$ 131,859
GLOBAL	GLOBAL	P115770	EE Cities Small Grants			3.1	4.1		Completed		\$ 239,942	\$ 208,738
GLOBAL	GLOBAL	P115793	Analytical Framework for EE Cities (TRACE) (Phase I)					5.1	Completed		\$ 843,725	\$ 737,931
GLOBAL	GLOBAL	P115771	EE Cities Good Practice Database				4.1, 4.3		Ongoing	Ongoing with results	\$ 176,123	\$ 184,610
GLOBAL	GLOBAL	P118728	Smart Meters	1.1				5.1	Completed		\$ 65,000	\$ 24,480
GLOBAL	GLOBAL	P120479	EE Cities Project Support Facility	1.1					Ongoing	Ongoing with results	\$ 576,345	\$ 396,274
GLOBAL	GLOBAL	P112187	Public Procurement of Energy Efficiency	1.1					Completed		\$ 244,841	\$ 265,309
GLOBAL	GLOBAL	P125554	EE for Water and Sanitation Utilities	1.1					Completed	Loan amount TBD	\$ 85,000	\$ 75,230
AFR	AFR	P120480	Energy Efficiency in Water Utilities						Completed	No observable results	\$ 50,000	\$ 38,999
Vietnam	EAP	P119287	Fuel efficiency, trade facilitation						Completed	No observable results	\$ 100,000	\$ 97,571
ECA	ECA	P123396	Chisinau Energy Supply Improvement						Completed	No observable results	\$ 150,000	\$ 150,000
Egypt	MNA	P121254	Energy Efficiency Study						Completed	No observable results	\$ 60,000	\$ 52,577
MNA	MNA	P122924	EECI Small Grants (Zarqa)						Completed	No observable results	\$ 179,198	\$ 130,217
Afghanistan	SA	P111239	Energy Savings Oppor. in Large Buildings						Completed	No observable results	\$ 146,287	\$ 146,287
GLOBAL	GLOBAL	P120481	IBNET Energy M & T Pilot						Completed	No observable results	\$ 219,470	\$ 213,704
GLOBAL	GLOBAL	P119866	EE Country Performance Indicators						Completed	No observable results	\$ 100,000	\$ 92,917
GLOBAL	GLOBAL	P113671	Transport & Climate Change						Completed	No observable results	\$ 240,000	\$ 74,069
GLOBAL	GLOBAL	P119918	EECI/Urban Mobility Strategies						Completed	No observable results	\$ 238,121	\$ 214,375
China	EAP	P123066	Government Facilities Energy Efficiency						Ongoing		\$ 120,000	\$ 97,627
China	EAP	P116044	China Heat Regulation Phase II						Ongoing		\$ 218,268	\$ 156,544
Uzbekistan	ECA	P122464	Energy Efficiency Strategy for Industrial Sector						Ongoing		\$ 196,400	\$ -
Brazil	LCR	P123713	Brazil Green Freight Transport NITA						Ongoing		\$ 100,000	\$ -
Egypt	MNA	P124688	EG-Energy Efficiency Strategy (Phase2)						Ongoing		\$ 165,150	\$ 65,369
GLOBAL	GLOBAL	P119998	Cost of Delivering DSM- EE Activities	12	7	3	3	6	Ongoing		\$ 90,000	\$ 63,880
		37									\$ 6,709,883	\$ 5,248,838

4. CLEAN ENERGY

Country	Region	Project ID	ESMAP Activity Title	1. Development Financing Informed	2. Policy/Strategy Informed	3. Client Capacity Increased	4. Knowledge Increased	5. Innovative Approaches & solutions generated	Project Status	Notes	Grant allocation	Grant disbursement
Mozambique	AFR	P101999	MZ-Modern Biofuels Assessment (FY09)	1.1	2.1				Completed		\$ 110,000	\$ 200,462
Africa	AFR	P126747	3A-Road to Durban-Energy Ministers Event				4.1		Ongoing	Ongoing w/ results	\$ 500,000	\$ 219,912
South Africa	AFR	P108461	ZA-ESMAP Low Carbon Growth (FY11)	1.1	2.1				Ongoing	Ongoing w/ results	\$ 500,000	\$ 339,066
China	EAP	P123227	CN-FY10 Urban Tran. Climate Change Strat	1.2	2.1				Ongoing	Ongoing w/ results	\$ 100,000	\$ 99,891
Indonesia	EAP	P108804	ID - Low Carbon Growth Strategy	1.1					Ongoing	Ongoing w/ results	\$ 400,000	\$ 386,234
China	EAP	P110557	CN-FY09 Urban Tran. Climate Change Strat	1.1					Completed		\$ 160,000	\$ 159,997
East Asia and P	EAP	P119220	Capacity Building for Renewable Energy			3.1			Completed		\$ 100,000	\$ 83,702
Philippines	EAP	P112371	Renewable Development and Market Reform	1.1	2.1	3.1			Ongoing	Ongoing w/ results	\$ 716,155	\$ 625,956
Slovak Republic	ECA	P090657	Regulation of Renewable Energy (ESMAP)		2.1				Completed		\$ 180,000	\$ 177,568
Bulgaria	ECA	P107982	REGULATION OF RENEWAL ENERGY		2.1				Completed		\$ 138,000	\$ 159,988
Poland	ECA	P114517	Poland Low Carbon Growth Study		2.1	3.1			Completed		\$ 260,000	\$ 260,000
Brazil	LCR	P105702	BR CCH Low Carbon Country Case Study	1.1	2.1	3.1		5.2	Completed	Informed lending/ n	\$ 1,057,500	\$ 1,056,001
Peru	LCR	P109969	PE (CCH) Overcoming Barriers to Hydropower	1.2			4.1		Completed		\$ 218,153	\$ 197,929
Peru	LCR	P103422	PE Small Hydropower		2.1				Completed		\$ 135,000	\$ 131,069
Mexico	LCR	P117870	MX Renew. Energy Assistance Program	1.1					Completed		\$ 880,619	\$ 832,774
Peru	LCR	P110305	PE Assess. of CC in Hydrology						Completed		\$ 277,680	\$ 205,119
Mexico	LCR	P118293	MX-Promoting Mini-Hydro Potential				4.3		Completed		\$ 112,124	\$ 105,873
Mexico	LCR	P108304	MX (CCH) Low Carbon Development Study	1.1	2.1	3.2			Completed		\$ 630,000	\$ 618,573
Latin America	LCR	P115422	Capacity Building in Renewable Energy for Implementing Agencies in IAC						Completed		\$ 100,000	\$ 87,689
Colombia	LCR	P107158	CO Alternative Energy and Bioenergy		2.1				Completed		\$ 90,000	\$ 89,318
Colombia	LCR	P108945	CO Policy Options for Renewables		2.1				Completed		\$ 176,000	\$ 155,011
Morocco	MNA	P114161	Low Carbon Transport Strategy - Morocco	1.1					Completed		\$ 165,629	\$ 149,856
Egypt, Arab Rep	MNA	P110330	EG Commercial Wind Development Framework	1.1					Completed		\$ 100,000	\$ 90,465
Middle East and	MNA	P113684	5M-Regional Solar Power Initiative	1.1					Completed		\$ 1,366,000	\$ 1,138,186
India	SAR	P101555	IN: Low Carbon Growth		2.1	3.1			Ongoing	Ongoing w/ results	\$ 930,000	\$ 813,711
India	SAR	P119536	IN: CSP-RenewEgy Mkt Transformation I			3.1			Ongoing	Ongoing w/ results	\$ 900,000	\$ 618,776
Sri Lanka	SAR	P099006	Private Renewable Power Generation Study				4.1		Completed		\$ 127,209	\$ 100,608
GLOBAL	GLOBAL	P118166	ESMAP - Expert Panel (FY10)						Completed		\$ 406,800	\$ 392,817
GLOBAL	GLOBAL	P120448	REMITI Coordination & Outreach				4.1		Completed		\$ 195,000	\$ 183,310
GLOBAL	GLOBAL	P120449	REMITI Knowledge Exchange (Geothermal)				4.1		Completed		\$ 100,000	\$ 59,880
GLOBAL	GLOBAL	P123069	Scaling Up Deployment of RE (various)				4.2		Completed		\$ 217,400	\$ 197,628
GLOBAL	GLOBAL	P123137	Adaptation Knowledge Dissemination				4.2		Completed		\$ 79,000	\$ 78,740
GLOBAL	GLOBAL	P113329	Clean Energy Technology Acceleration		2.6				Completed		\$ 130,000	\$ 125,792
GLOBAL	GLOBAL	P117056	LCCS Knowledge Products					5.2	Ongoing	Ongoing w/ results	\$ 1,127,522	\$ 926,819

LIST OF CE ACTIVITIES CONTINUES ON THE NEXT PAGE.





## ANNEX 3 | WORLD BANK LENDING OPERATIONS INFORMED BY ESMAP ACTIVITIES

PROJECT ID	COUNTRY	REGION	WBG LENDING OPERATION	WBG LOAN (US\$ M)
P105654	Regional	AFR	Southern African Power Market Project – Adjustable Programmatic Loan 1	180
P097201	Regional	AFR	Regional and Domestic Power Market Development Project	196
P084404	Regional	AFR	Mozambique - Malawi Transmission Interconnection Project - Adjustable Programmatic Loan 2	45
P078091	Burkina Faso	AFR	Burkina Faso Energy Access Project	38.8
P104456	Cameroun	AFR	Energy Sector Development Project	65
P106982	DRC	AFR	Democratic Republic of Congo - Growth with Governance in the Mineral Sector	50
P120016	Ghana	AFR	Energy Development and Access Project (GEDAP)	0.2
P103037	Kenya	AFR	Kenya Electricity Expansion Project	330
P099626	Malawi	AFR	Energy Sector Project	0.3
P111018	Mali	AFR	Mali Additional Financing for the Household Energy and Universal Access Project	8.5
P108444	Mozambique	AFR	Energy Development and Access Project (EDAP)	0.3
P111567	Rwanda	AFR	Rwanda Electricity Access Scale-up and Sector Wide Approach Development Project	70
P120629	Senegal	AFR	Second Sustainable and Participatory Energy Management project (PROGEDE II)	15
P096302	Tanzania	AFR	Tanzania - Sustainable Management of Mineral Resources	50
P101645	Tanzania	AFR	Tanzania Energy Development and Access project	111.5
P117656	Regional	EAP	Kunming Urban Rail Project	300
P064844	Cambodia	EAP	Cambodia-Rural Electrification and Transmission Project	40
P119654	China	EAP	Guangdong Green Freight Demonstration Project	5
P098915	China	EAP	GEF - Tianjin Eco-city Project	6
P114182	China	EAP	GEF - Provincial Energy Efficiency Scale-up Program	13
P114069	China	EAP	Shangdong Province Energy Efficiency	150
P106956	China	EAP	Ningbo New Countryside Development Project	1
P120313	Indonesia	EAP	Indonesia Climate Change Development Policy Loan	200
N/A	Philippines	EAP	Clean Technology Fund (IFC)	250
P075531	LAO	EAP	LAO Rural Electrification Phase I Project of the Rural Electrification (APL) Program	13.8
P110978	LAO	EAP	LAO - Rural Electrification Project – Phase II	25.7
P108768	Mongolia	EAP	Mongolia – Mining Sector Technical Assistance Project	9.3
P102396	PNG	EAP	Papua New Guinea - Second Mining Sector Institutional Strengthening TA	17
P114875	Vietnam	EAP	Vietnam Transmission & Distribution 2-Add Fin	180
P111182	Vietnam	EAP	Poverty Reduction Strategy Credit 9 for Vietnam	150
P116748	Armenia	ECA	Electricity Supply Reliability Project	39
P089656	Macedonia	ECA	(GEF) Sustainable Energy Project	3

P106956	Moldova	ECA	Moldova - Additional Financing for Energy Project II	10
P115426	Poland	ECA	Energy Efficiency Development Policy Loan	114
NA	SEE	ECA	Energy Community of South East Europe Adaptable Program Loan	1000
P110643	Turkey	ECA	Programmatic Electricity Sector Development Policy Loan	720
P110841	Turkey	ECA	Energy Community of South East Europe Adjustable Programmatic Loan #6	200
P112578	Turkey	ECA	Private Sector Renewable Energy and Energy Efficiency Project	500
P117651	Turkey	ECA	Environmental Sustainability and Energy Sector – Development Policy Loan 2	350
P096586	Ukraine	ECA	Ukraine Energy Efficiency Project	200
P073367	Bolivia	LAC	Bolivia - Decentralized Infrastructure for Rural Transformation Project (IDTR)	20
P114204	Brazil	LCR	Electrobras Distribution Rehabilitation Project	388
P10434	Honduras	LCR	Honduras - Power Sector Efficiency Enhancement Project (PROMEF)	4.2
P112780	Jamaica	LAC	Energy Investments and Technical Assistance	15
P115608	Mexico	LCR	Mexico Framework for Green Growth Development Policy Loan	1503
P121800	Mexico	LCR	Low Carbon Development Policy Loan	400
P080104	Mexico	LCR	GEF Wind Umbrella Project III	17
P106424	Mexico	LCR	Mexico Energy Efficiency Lighting and Appliances GEF Project	321
P090116	Peru	LCR	Rural Electrification Project	50
P090110	Peru	LAC	Peru - First Rural Electrification Project	10
P117864	Peru	LAC	Peru - Second Rural Electrification project	50
P116194	Egypt	MNA	Giza North Power Project	600
P100047	Egypt	MNA	Ain Sokhna Power	600
P113416	Egypt	MNA	Egypt Wind Power Development Project	220
P117407	Egypt	MNA	Helwan South Power Project	385
P115659	Morocco	MNA	Urban Transport Sector Development Policy Loan	137
P099618	Morocco	MNA	Morocco-Energy Sector Development Policy Loan	100
P104266	Tunisia	MNA	Tunisia Energy Efficiency and Renewable Energy Investment Project	55
P111741	West Bank	MNA	Municipal Development Program Phase I	1
P098151	Bangladesh	SA	Clean Air Sustainable Environment (CASE) Project	62
P112963	Bangladesh	SA	Additional financing for the Bangladesh Rural Electrification and Renewable Energy Development (RERED)	90
P112893	India	SA	Kabeli Transmission Project	38
NA	India	SA	IFC Loan for MSETCL	200
P110051	India	SA	India - Haryana Power System Improvement Project	330
P100101	India	SA	Coal-Fired Generation Rehabilitation	180
P100531	India	SA	Coal-Fired Generation Rehabilitation II	45
P095982	Pakistan	SA	Electricity Distribution and Transmission Improvement Program Project	267