ESMAP
The Energy Sector Management Assistance Program

ESMAP Portfolio Review FY2009-2011

February 2011

Contents

1. Abbreviations and Acronyms

AAA	Analytical Advisory Activities
ABG	Annual Block Grant
AIS	Activity Initiation Summary
APL	Adaptable Programmatic Loan
AUS	Activity Update Summary
ACS	Activity Completion Summary
ARA	African Refineries` Association
AUSAID	Australian Agency for International Development
CAS/CPS	Country Assistance Strategy/ Country Partnership Strategy
CF	Carbon Finance
COP	Conference of the Parties (to UNFCCC)
CDR	Client Document Review
CPF	Carbon Partnership Facility
CTF	Clean Technology Fund
DANIDA	Danish International Development Agency
DPL	Development Policy Loan
EA	Energy Access
EASP	Energy Assessment and Strategy Program
EE	Energy Efficiency
EECI	Energy Efficient Cities Initiative
EFFECT	Energy Forecasting Framework & Emissions Consensus Tool
ESMAP	Energy Sector Management Assistance Program
ESW	Economic and Sector Work
GEF	Global Environment Facility
GHG	Greenhouse Gas
GIS	Geographical Information System
GPOBA	Global Partnership for Output Based Aid
HTG	“How to” Guide
ICR	Implementation Completion Report

IEG	Independent Evaluation Group
IFC	International Financial Corporation
INFRA	Infrastructure Recovery and Assets Platform
JICA	Japan International Cooperation Agency
KSF	Knowledge Exchange Forum
LTMS	Long Term Mitigation Scenarios
M & E	Monitoring and Evaluation
PCN/PAD	Project Concept Note / Project Appraisal Document
POL	Policy Note
PPA	Power Purchase Agreement
PPIAF	Public Private Infrastructure Advisory Facility
PT	Partnership
RE	Renewable Energy
REMTI	Renewable Energy Market Transformation Initiative
RPT	Report
SSA	Sub Saharan Africa
SIL	Specific Investment Loan
SME	Small Medium Enterprise
SREP	Scaling-Up Renewable Energy Program
TA	Technical Assistance
ToU	Time of Use
TRACE	Tool for Rapid Assessment of City Energy
TTL	Task Team Leaders
UNFCCC	United Nations Framework Convention on Climate Change
UNDP	United Nations Development Programme
WBG	World Bank Group

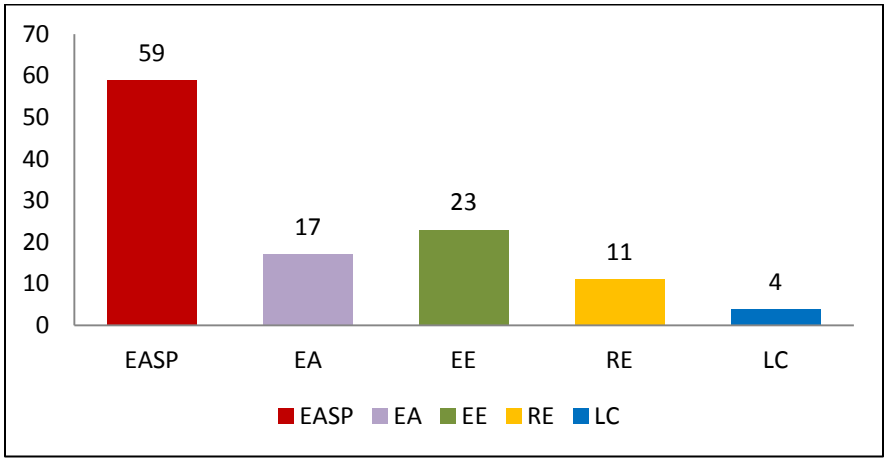
2. Executive Summary

As part of the implementation of the M&E system, ESMAP is assessing the impacts of its upstream activities on World Bank Group (WBG) lending operations as well as on government policies, country capacities, and on development community interventions. This initiative is a major step towards accounting for results and complements ongoing efforts to track the portfolio's performance against planned outputs and intermediate outcomes. This report, prepared as part of the ESMAP's annual portfolio review, takes stock of the results and outcomes of activities implemented during the FY2009-FY2011 period under five themes (or portfolios), namely: *Energy Assessment and Strategy Program (EASP), Energy Access (EA), Energy Efficiency (EE), Renewable Energy (RE), and Low Carbon Growth (LCG).*

The objectives of this review are twofold: First, to provide an overview of the portfolio of *activities completed and delivered* under each of the portfolios and second, and most importantly, to review the results and impacts of all completed ESMAP activities in terms of their effectiveness, influence and value-added in the WBG's dialogue and development strategy with client countries. In that respect, the review was conducted based on four ESMAP high-level outcomes: (i) *Influencing World Bank lending and strategy; (ii) Informing government policy; (iii) Building or enhancing client capacity; and, (iv) introducing cutting-edge energy solutions to clients*.

To conduct the assessment, a desk review was first undertaken for all ESMAP activities implemented since 2009, relying on official Bank project documentation. Then, each of the five portfolios of activities was evaluated against the four outcomes outlined above. The findings of the desk review were triangulated with information from other sources, including interviews with World Bank Task Team Leaders, Country Assistance Strategies, Independent Evaluation Group (IEG) reports, selected websites from ministries, agencies, and organizations from client countries governments. No country surveys or visits were undertaken for any of the activities evaluated, and research and analysis was conducted solely based on the sources of information listed above.

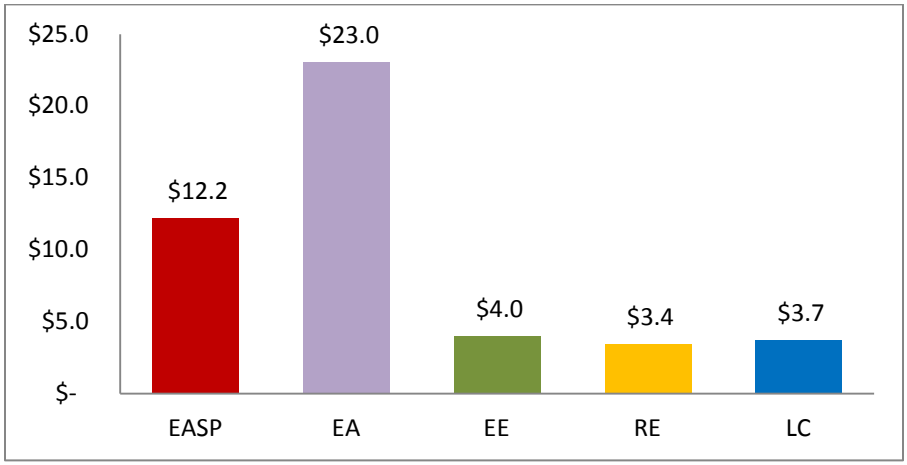
Figure 1: Total Number of Completed Activities by Portfolio Type



A total of 211 ESMAP activities, both completed and ongoing, are under the five ESMAP portfolio themes (*EASP, EA, EE, RE, LCG)* for the FY2009-2011 period (Figure 1). *However, only completed activities (114) were considered for this review;* in certain cases, ongoing activities were also evaluated, as some results and impacts have been measured.

Grant disbursement as of January 2011, under the FY2009-2011 ESMAP portfolio, including both completed and ongoing activities (211) was about $46.3 million. Energy Access (including projects supported under AFREA) with $23 million, accounts for almost half of the total grant disbursement, followed by EASP with $12.2 million (Figure 2).

Figure 2: Grant Disbursements by Portfolio Type (amounts in US$ Millions)

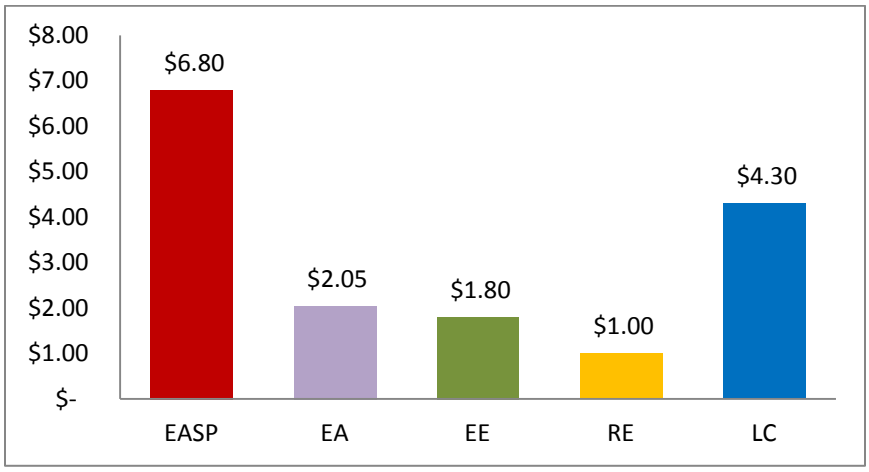


In terms of the results and outcomes achieved by ESMAP activities, the review provided important conclusions and insights. While the influence of activities is more evident in informing Bank lending and strategy, there is also important evidence of ESMAP's contribution on government policies, enhancing country capacity, and introducing cutting-edge solutions[1]. Key conclusions of the review are as follows:

- ESMAP has played an active role in influencing and improving, directly and indirectly, the direction and quality of the World Bank Group's lending and strategy in the energy sector. A total of 70 ESMAP activities influenced about $16 billion in World Bank Group financing, including IDA credits provided in support of energy projects in client countries. Activities under the EASP portfolio alone enabled about $6.8 billion in World Bank Group financing (Figure 3).

[1] Some ESMAP activities contributed to achieving one or more outcomes. Therefore, some activities could account for one or more outcomes under a particular portfolio.

Figure 3: World Bank Group Lending Influenced by Portfolio Type (in $ Billions)



- 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. Since FY2009, 38 ESMAP activities have influenced energy policies in more than 30 countries.

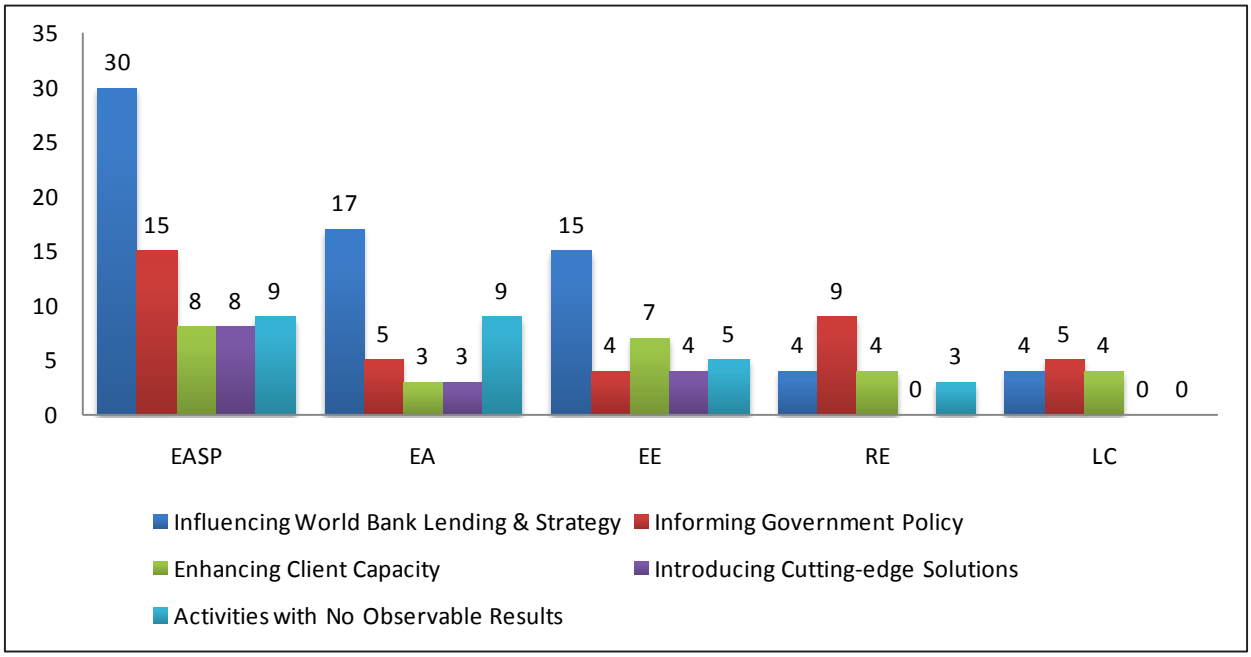
- ESMAP has also contributed to support client countries to build or enhance their capacity to implement policies, programs and strengthen institutions in the energy sector. This is undertaken in a number of ways including advice on client-owned blueprints for institutional strengthening, operational advice on policy formulation and hands-on implementation, preparation of technical notes, good practice manuals, and sharing international good practice. Since FY2009, 26 ESMAP activities have contributed in capacity building in more than 40 client countries.

- ESMAP has undertaken original analytical work and developed 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, 15 ESMAP activities have been developed to introduce innovative products that will benefit the wider energy practice in client countries.

- Of the 114 completed ESMAP activities covered in the analysis, direct results and outcomes could not be tracked or observed for 26 of them. 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 4 below presents the summary of outcomes achieved of ESMAP completed activities under each of the portfolios.

Figure 4: Number of ESMAP Activities with Observed Results by Portfolio and Outcome Type



3. Introduction

In accordance with its 2008-2013 Strategic Business Plan, ESMAP has 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.

As part of the implementation of the M&E system, ESMAP is assessing the impacts of its upstream activities on World Bank Group (WBG) lending operations as well as on government policies, country capacities, and on the development community's interventions. This initiative is a major step towards accounting for results and complements ongoing efforts to track the portfolio's performance against planned outputs and intermediate outcomes.

This report, prepared as part of ESMAP's annual portfolio review, takes stock of the results and outcomes of activities implemented during the FY2009-FY2011 period under five themes, namely: ***Energy Assessment and Strategy Program (EASP), Energy Access (EA), Energy Efficiency (EE), Renewable Energy (RE), and Low Carbon Growth (LCG***). It should be noted that even though some activities were initiated before FY2009, they are part of the assessment because they were delivered to the client during the time frame of the assessment (FY2009-FY2011), or were a component of a programmatic activity that spanned several years or several countries.

The objectives of this review are twofold: First, to provide an overview of the portfolio of activities completed and delivered under each of the portfolios and second, and most importantly, to review the results and impacts of all completed ESMAP activities in terms of the following high-level outcomes:

1. ***Influencing World Bank lending and strategy***: ESMAP focuses its efforts "upstream" , through its three core functions (think tank, knowledge clearinghouse, and operational leveraging), aiming at influencing and improving, directly and indirectly, the quality of the World Bank's strategy and lending in the energy sector.

2. ***Informing government policy:*** ESMAP provides policy advice and helps build consensus on sustainable energy development within governments of developing countries and economies in transition. ESMAP's technical assistance helps client countries make better-informed policy decisions and translate those decisions into strategies and programs. These often lead to new legal and regulatory frameworks, adoption of sector strategies and implementation plans, compliance with existing laws, or other policy formulation.

3. ***Building or enhancing client capacity:*** ESMAP also provides support to client countries by helping them improve their capacity to implement policies or programs and strengthen institutions in the energy sector.

4. ***Introducing cutting-edge energy solutions to clients***: ESMAP undertakes original analytical work and develops innovative tools to help practitioners assess energy problems and develop solutions.

For the purpose of this review, only 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 report is organized as follows:

- Chapter 4 outlines the methodology used to assess results and impacts.
- Chapter 5 is dedicated to the assessment of outcomes and results under each portfolio. For each portfolio type, the chapter is broken down into four sections:
  - Section 1 provides an overview of the portfolio covered in this review.
  - Section 2 summarizes the key results achieved by ESMAP activities under four different sets of outcomes.
  - Section 3 highlights specific cases of impacts achieved by some activities under each portfolio.
  - Section 4 lists those activities with limited or no observable results or outcomes, or in some cases, where data was not available, fragmented or inconclusive.

4. Methodology and Data Sources

ESMAP serves its clients through knowledge and technical services. The performance of these functions yields outputs such as sector assessments, studies, best practice toolkits, dissemination seminars and workshops, training and other forms of advisory and analytical assistance.

To the extent that these outputs are adopted and mainstreamed effectively, the following outcomes would be achieved: (i) influencing World Bank energy lending and strategy; (ii) informing government policy; (iii) building /enhancing client capacity; and (iv) introducing cutting-edge energy solutions in client countries. These outcomes in turn help shape ESMAP's program-level impacts in terms of poverty reduction, economic growth, and energy security.

Given the upstream nature of ESMAP's activities, program-level impacts can only be ascertained and tracked after a longer time lag than covered in this report. As a result, this report is primarily focused on tracking the inputs, outputs and intermediate results and outcomes of activities implemented during FY2009-FY2011. For this purpose, a multilayered approach was followed:

- First, a portfolio review was undertaken for ESMAP activities that were implemented since 2009, with a view to developing a comprehensive picture of disbursements and outputs.
- Second, each of the portfolios was assessed based on the four outcomes outlined above. For this purpose, a desk review of official Bank documentation (including Project Concept Document (PCN), Project Appraisal Document (PAD), Implementation Completion Reports (ICR),

Implementation Status and Results Reports (ISR), back to office reports, workshop proceedings, minutes and miscellaneous correspondence) was undertaken to establish the ex-ante conditions before the ESMAP activity, intended or expected results and outcomes, as well as the actual results and outcomes after the completion and implementation of the activities. These documents were accessed from World Bank information systems and selected databases including SAP (AIS, AUS, ACS), IRIS, Operations Portal, Business Warehouse, Image Bank, e-TF, ESMAP Lotus Notes project database, and ESMAP publications database and website.

- Finally, the findings of the desk review were triangulated with information from other sources including interviews with World Bank Task Team Leaders, Country Assistance Strategies, Independent Evaluation Group (IEG) reports, selected websites from ministries, agencies, and organizations from client countries governments.

The approach used, however, entailed certain limitations:

- There was limited availability of adequate baseline data in many of the projects evaluated. The use of appropriate baseline data is critical for performance evaluation. 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 was conducted solely based on the sources of information listed above.
- 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.

5. Portfolio Reviews

5.1 Energy Assessment and Strategy Program (EASP)

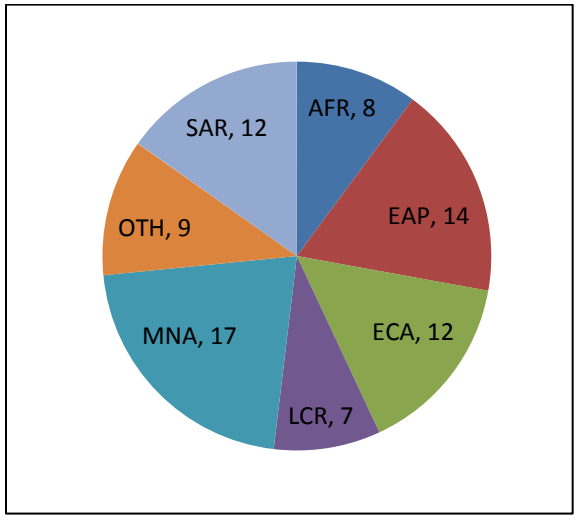
5.1.1 Overview of the EASP Portfolio (FY2009-FY2011)

This section discusses activities carried out and implemented under the Energy Assessment and Strategies Program (EASP), one of the four programs and initiatives being implemented under the ESMAP 2008 – 2013 Strategic Business Plan. Activities categorized under the EASP include country energy sector vulnerability assessments, regional energy integration activities, as well as activities undertaken for supporting development of sector strategies and policies.

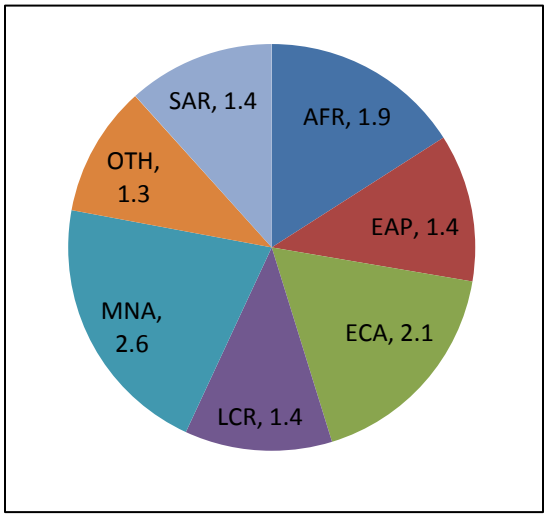
The FY2009-2011 EASP portfolio includes 79 activities with grant disbursement totaling $12.2 million (see Annex 1 for complete list of ESMAP EASP activities). The largest number of EASP activities was implemented in the Middle East and North Africa region, followed by East Asia and Pacific, South Asia, Europe and Central Asia, Africa, and Latin America and Caribbean. 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 (Figures 1a and 1b).

Figure 5: ESMAP Energy Assessment and Strategy Program Activities by Region

a) By Number of Activities



b) By Disbursement ($ Million)



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

The breakdown of the total EASP portfolio according to the nature of activities and output type is as shown in Table 1 below (for description of product lines and outputs types please refer to Annex 2).

Table 1: EASP Portfolio Breakdown by Product Lines, Output Type and Region

Product Line and Output Type /Region	AFR	EAP	ECA	LCR	MNA	GLB	SAR	Grand Total
Energy Sector Work								
Policy Note	0	3	0	0	4	0	1	8
Report	4	3	4	5	3	3	5	27
Knowledge Product								
Databases	1	0	0	0	0	0	0	1
Operational Guide	0	0	0	0	0	2	0	2
Studies	0	3	1	0	1	3	1	9
Partnership	0	0	0	0	0	1	0	1
Technical Assistance Non-Lend								
"How-To" Guidance	2	2	5	2	7	0	3	21
Client Document Review	0	2	0	0	0	0	0	2
Institutional Development Plan	1	1	1		2		1	6
Knowledge-Sharing Forum	0	0	0	0	0	0	1	2
Grand Total	**8**	**14**	**12**	**7**	**17**	**9**	**12**	**79**

Of the total of 79 activities, 59 have been completed and delivered to clients while the remainder is still ongoing, with delivery to client expected either in FY2011 or FY2012. Only completed activities were considered for the assessment of outcomes and results.

5.1.2 Assessment of Outcomes and Results

This section discusses the results of completed activities of the EASP portfolio measured under four outcomes: (i) influence Bank lending and energy strategies, (ii) inform government policy, (iii) build or enhance client capacity, and, (iv) introduce cutting-edge solutions.

5.1.2.1 Influence World Bank Lending

Since ESMAP focuses its efforts "upstream", a key measure of success is the extent to which ESMAP is able to influence the direction and quality of the Bank's strategies and lending in the energy sector. This review demonstrates that ESMAP's activities, particularly through the Annual Block Grants (ABGs), have, both directly and indirectly, helped shape the Bank's energy strategies and lending.

ESMAP's EASP activities have played a role in increasing the Bank's energy lending from $4.5 billion in FY2008 to $10.4 billion in FY2010. Out of the 59 completed activities, direct results and outcomes could be observed and tracked for 50 activities, although there was great variety in the degree of effectiveness of these activities. Activities implemented under EASP during FY09-FY11 have directly influenced World Bank lending of $6.8 billion, representing more than a fifth of total energy lending over the FY09-FY11

period[2]. EASP activities have been especially effective in influencing lending for some major developing 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 (TEĐAĐ). The work undertaken by ESMAP has been instrumental in facilitating a considerable scale up of the World Bank's lending to Turkey.

In Egypt, ESMAP has helped the government develop an analytical framework and strategy for energy tariffs that are reflective of the underlying economic costs, to 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 lending projects. 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 power sector vulnerability study has helped identify the priority investments that the Bank could finance in the wake of the global financial crisis. Two of these investment projects are currently under preparation by the Bank.

In Vietnam, ESMAP is helping guide the development of the country's Master Gas Plan and in assessing the impacts of the global financial crisis on the power sector. These engagements have helped underpin a series of World Bank investment projects and development policy loans.

Table 2 below shows the complete list and amount of World Bank Group lending projects influenced by EASP ESMAP activities.

Table 2: List of World Bank Group Lending Projects Influenced by EASP Activities during FY2009-2011

Country	Name of ESMAP Activity	WB Lending Project (FY, $) and ESMAP's Role
China	**A *Strategy for Coal Be Methane(CBM) and Coal Mine Methane (CMM) Development and Utilization in China***	***Shanxi Coal Bed Methane Development (FY09, $80M)*** The ESMAP activity assesses the prospects for China's gas supply and demand, and the role of Coal Bed Methane in reducing Liquefied Natural Gas imports. It provides the analytical underpinnings for the above loan to increase the production and utilization of CBM/CMM to replace coal as a fuel for thermal use and to reduce Green House Gases and local air pollutants associated with coal combustion. **Related WBG lending prior to ESMAP activity:** None
Djibouti	***Energy Sector Master Plan for Djibouti***	***Power Access and Diversification (FY06, $6.9M) and,***

[2] FY11 and after FY11 lending numbers are for projects in pipeline for approval.

		Power Access and Diversification AF(FY10, $6M) The 10 year *Energy Sector Master Plan* for Djibouti lays out the sector's priority investments (throughout the supply chain, going from generation to distribution). These World Bank loans are for undertaking priority investments in distribution, including investments identified in the Master Plan. **Related WBG lending prior to ESMAP activity:** None
Egypt	***Egypt Design of Load Management Program and Time of Use Tariffs***	***Ain Sokhna Power (FY09, $600M)*** This loan is aimed at helping to implement time of use tariff design prepared under the ESMAP Activity. **Related WBG lending prior to ESMAP activity:** In the three years prior to the recent ESMAP activities, World Bank energy lending for Egypt was $259.6 million. Following the two recent ESMAP activities, WB energy sector lending for Egypt has increased to $1.4 billion.
Egypt	***Egypt Energy Pricing Strategy***	***Ain Sokhna Power (FY09, $600M)*** ***Giza North Power Project (FY10, $600M)*** This ESMAP study recommended an energy pricing strategy which provided the analytical underpinning for both these investment projects by highlighting the importance of tariffs price that are reflective of the underlying economic costs and considering financial, equity and fiscal implications. **Related WBG lending prior to ESMAP activity:** In the three years prior to the recent ESMAP activities, World Bank energy lending for Egypt was $259.6 million. Following the ESMAP activities, WB energy sector lending for Egypt has increased to $1.4 billion.
Egypt and Jordan	***Country Energy Sector Vulnerability Assessment – Egypt and Jordan***	***Helwan South Power Project (FY11, $385M)*** ***Egypt Dairut Independent Power Project (Proposed)*** ***Jordan Fujeij Wind IPP (Proposed)*** These loans were identified based on this ESMAP assessment carried out to estimate the impact of the financial crisis and identify investment shortfalls in the power sector in Egypt. These lending projects have been flagged by the government as requiring priority financing from the World Bank. **Related WBG lending prior to ESMAP activity:** None

India	***Best Practice in Energy Efficiency Improvement in Coal Fired Generation*** ***Regulatory and Planning Requirement for Rehabilitation of Coal Fired Generation***	***Coal-Fired Generation Rehabilitation (FY09, $180M)*** ***Coal-Fired Generation Rehabilitation (FY09, $45.4M)*** The two ESMAP activities have helped facilitate the preparation of World Bank loans for the rehabilitation of coal-fired plants in India. **Related WBG lending prior to ESMAP activity:** In the three years prior to the recent ESMAP activities, there was no World Bank lending for coal fired generation rehabilitation in India.
India	***Organizational Transformation and Public Private Partnerships in Maharashtra State Electricity Transmission Corporation Limited (MSETCL)***	***IFC Loan for MSETCL ($200M)*** The ESMAP activity has helped to lay the foundations for IFC's loan to MSETCL. **Related WBG lending prior to ESMAP activity:** In the three years prior to the ESMAP activity, there was no World Bank Group lending for organizational transformation of transmission utilities in India.
Jamaica	***Assessing the Impact of Recent Credit Constraints on Energy Sector Investment Requirements in Latin America.***	***JM Energy Investments and TA (FY11, $15M)*** The loan was prepared in parallel with the ESMAP activity; consultations undertaken with the Jamaican government as part the ESMAP activity helped identify energy investments to be funded through this loan. **Related WBG lending prior to ESMAP activity:** None
Morocco	***Structuring a New Energy Agency***	***Morocco-Energy Sector DPL (FY07, $100M)*** The ESMAP activity has helped restructure a new energy efficiency and renewable energy agency. Approval of a law for setting up new energy agency is a tranche release condition for the loan. **Related WBG lending prior to ESMAP activity:** None
Morocco, Tunisia	***Maghreb Energy Market Study*** ***Morocco Energy Supply Strategy***	***Morocco - Ouarzazate Concentrated Solar Power (FY11, $200M)*** ***Tunisia -Concentrated Solar Power (FY12, $200M)*** The ESMAP activities have helped facilitate investments under the MENA Concentrated Solar Power (CSP) scale up initiative. Workshops undertaken under the former activity helped facilitate discussions and forge consensus on CSP development options, while a study prepared under the latter activity identified CSP as one of the low carbon options to be proposed for funding by the Clean Technology Fund. IBRD loans are now in preparation for three CSP plants, and six more plants are to be financed in part through IBRD loans.

		Related WBG lending prior to ESMAP activity: In the three years prior to the ESMAP activity, there was no World Bank Group lending for concentrated solar power in Middle East and North Africa. Following the ESMAP activity, WB lending pipeline for this has increased to $400 million.
South East Europe	***SEE Gasification Study,*** ***SEE Wholesale Market Opening Study***	***Energy Community of South East Europe Adaptable Program Loan (APL) ($1000M)*** These series of ESMAP studies are helping explore institutional and regulatory issues associated with establishment of energy markets, including electricity and gas markets in South East Europe. The Bank has approved a $1 billion Adaptable Program Loan for undertaking investments associated with energy markets in the region. **Related WBG lending prior to ESMAP activity:** None
Southern Africa, Mozambique, Malawi	***Southern Africa Power Market: Indicative Generation & Transmission Expansion Study***	***Southern African Power Market Project -APL1 (FY09, $180M)*** ***Regional and Domestic Power Market Development Project (FY07, $196M)*** ***Mozambique - Malawi Transmission Interconnection Project - APL2 (FY08, $45M)*** This ESMAP study has helped prepare a least cost expansion plan for generation and transmission infrastructure associated with SAPP. The World Bank has funded several investments associated with SAPP. **Related WBG lending prior to ESMAP activity:** None
Tunisia	***Tunisia Review of Energy Management Policy***	***Tunisia -ENERGY EFFICIENCY AND RENEWABLE INV (FY09, $55M)*** The Bank loan will implement one of the suggested financing mechanisms recommended by the ESMAP activity. **Related WBG lending prior to ESMAP activity:** In the three years prior to the ESMAP activity, World Bank lending for renewable energy (RE) and energy efficiency (EE) in Tunisia was $5.5 million. Following the ESMAP activity, WB lending for RE and EE in Tunisia has increased to $55 million.

Turkey	***Supporting Electricity Market Operations,*** ***Capacity Building for Electricity Market Operations***	***Programmatic Electricity Sector DPL (FY09, $720M)*** ***ECSEE APL#6 (TURKEY) (FY11, $220M)*** ***Private Sector RE and EE Project (FY09, $500M)*** ***ESES DPL2 (FY10, $350M)*** ***ESES DPL 3 (FY11, $455M)*** ***TURKEY SME ENERGY EFFICIENCY (FY11, $307.5M)*** Through a series of activities, ESMAP has provided technical advice and training for the development and implementation of power market reforms, including launching of hourly metering and settlement, day ahead electricity market, capacity certificates in Turkey. These reforms have helped facilitate a scale up of World Bank energy lending to Turkey in recent years. **Related WBG lending prior to ESMAP activity:** Bank lending for Turkey's power sector was $1.1 billion in the three years prior to the two ESMAP activities. Bank Lending for Turkey's power sector increased to $2.6 billion in the three years following the ESMAP activities.
Vietnam	***Country Energy Sector Vulnerability Assessment – Vietnam, Indonesia, Philippines***	***Vietnam - Transmission & Distribution 2-Add Fin (FY11, $180M)*** 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. **Related WBG lending prior to ESMAP activity:** None
Vietnam	***Gas Sector Development Framework, Gas Master Plan***	***Poverty Reduction Strategy Credit 10 for Vietnam (FY10, $150M)*** ESMAP has 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. **Related WBG lending prior to ESMAP activity:** None

Several of the World Bank loans which were influenced by upstream ESMAP activities have had a variety of direct development impacts in client countries. Table 3 summarizes the impact of these loans that were influenced by ESMAP activities[3].

Table 3: Impact of World Bank Group Loans Influenced by ESMAP FY2009-11 EASP Activities

Country	Lending Project (S)	Impact of Bank Loans
Djibouti	***DJ-Power Access and Diversification (FY06, $6.9M)*** ***DJ-Power Access & Diversification AF(FY10, $6M)***	5250 new electricity connections. The emergency fuel purchase intervention increased the reliability of power generation by ensuring that it could be maintained at similar levels to the previous year.
Egypt	***EG-Ain Sokhna Power (FY09, $600M)***	In 2010 Industrial tariff reform for regulated Industry was resumed. Time of Use tariff not yet implemented but to be implemented by 2015.
India	***IFC Loan for MSETCL ($200M)***	MSETCL is on track to double its generation and transmission capacity
Morocco	***MA-Energy Sector DPL (FY07, $100M)***	Approval by the Council of Government of the Law for Energy Efficiency and Renewable Energy. Formal creation of a Committee for the Implementation of Electricity Sector Reform. Capacity ceiling for self-generation raised: '50 MW law' established, allowing industry and consumers to produce their own power up to 50 MW.
Southern Africa, Mozambique, Malawi	***Southern African Power Market Project -APL1 (FY09, $180M)*** ***Regional and Domestic Power Market Development Project (FY07, $196M)*** ***Mozambique - Malawi Transmission Interconnection Project - APL2 (FY08, $45M)***	Reliable electricity generation capacity increased from less than 600MW to 813 MW by 2010. 50,000 more households to be connected to electricity in Kinshasa by 2013.

[3] The table only lists impacts that have already been realized. The vast majorities of loans influenced by ESMAP activities are currently under implementation and will achieve country level impacts over the next several years.

Turkey	***Programmatic Electricity Sector DPL (FY09, $720M)*** ***ECSEE APL#6 (TURKEY) (FY11, $220M)*** ***Private Sector RE and EE Project (FY09, $500M)*** ***ESES DPL2 (FY10, $350M)*** ***ESES DPL 3 (FY11, $455M)*** ***TURKEY SME ENERGY EFFICIENCY (FY11, $307.5M)***	Capacity of renewable electricity or thermal heating plants increased from 1540 MW in 2009 to 2118MW in 2010. CO2 emissions reductions of 1871000 tons. Hourly settlement launched in December 2009, day-ahead market platform completed and under testing. Credible pricing mechanism attracts investment and has enabled utilities to pay their arrears to electricity suppliers. About 8,000 MW of the 10,000 MW capacity addition target for the 2008-2011 period reached as of December 2010. Winning bidders for privatization of 7 companies announced.

5.1.2.2 Influence Bank Energy Strategies

EASP activities have directly influenced the preparation of the 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 regions. In addition, ESMAP, under its Country Power Sector Vulnerability Assessments Program has played an important role in framing the Bank's infrastructure response to the global financial crisis through the Infrastructure Recovery and Assets (INFRA) Platform (see Table 4 for more details). ESMAP's role in the preparation of WBG energy strategy and East Asia and Pacific energy strategy is particularly noteworthy.

For the preparation of the Bank Group's new energy strategy, ESMAP supported the preparation of background papers on energy subsidy reform, clean energy technology choices, private and public sector roles in the power sector, and energy access. These papers are helping frame the consultations that are being undertaken around the world as part of strategy preparation. The preparation of the energy strategy also benefits from the wider body of analytical and advisory work undertaken by ESMAP in recent years.

In East Asia and Pacific, 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 for a sustainable energy future in East Asia, including a menu of options and successful examples of policy frameworks and financing mechanisms, was prepared.

Table 4: World Bank Group Energy Strategies Influenced by EASP Activities

Country /Region	Name of ESMAP Activity	Strategic Area and Influence of ESMAP activity
Global	***Energy Sector Strategy*** ***Public Private Sector Roles*** ***Power Sector Market Structure***	**Strategic Area:** World Bank Group's Energy Strategy **ESMAP influence:** The World Bank Group is currently in the process of preparing its energy strategy. ESMAP has directly influenced the process by helping prepare background papers on energy subsidy reform, clean energy technology choices, private and public sector roles in the power sector, and energy access. In addition, the strategy has been indirectly influenced by numerous other ESMAP Studies and reports.
East Asia Pacific	***Winds of Change: East Asia's Sustainable Energy Future***	**Strategic Area:** World Bank's East Asia and Pacific's Energy Strategy **ESMAP influence:** 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 East Asia and Pacific region of the Bank has undertaken a number of activities to implement the recommendations of this report.
South Asia	***Impact of the Global Financial Crisis on Investment in South Asia's Electric Power Infrastructure***	**Strategic Area:** South Asia's Power Sector **ESMAP influence:** The ESMAP study is informing the ongoing updates to the Bank's power sector strategy in the region by mapping the different sources of financing available to the power sectors in the region.
Central America	***Programmatic Energy Study***	**Strategic Area:** World Bank Strategy for Central America's Power Sector **ESMAP influence:** 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.
Middle East and North Africa	***Maghreb Energy Market Study,*** ***Explore Potential of Electricity Trade and Interconnection Between Yemen, Djibouti, and GCC Countries,*** ***Assessment of Energy Integration in the Mashreq Countries***	**Strategic Area:** Bank work program for regional integration of energy markets in Middle East and North Africa **ESMAP influence:** This series of ESMAP studies has helped prepare the World Bank's work program for regional integration of energy markets in Middle East and North Africa.

Global	**ESMAP's energy sector vulnerability assessments in 19 countries in support to INFRA**	**Strategic Area:** World Bank's Infrastructure and Recovery Assets Platform **ESMAP influence:** In the wake of the global financial crisis, the World Bank Group set up the INFRA platform to scale up financing for infrastructure in the crisis environment. Accordingly, the Bank's financing for energy sector increased from $4.5 billion in FY08 to $6.7 billion in FY09 and $10.4 billion in FY10. ESMAP has supported INFRA by helping undertake energy sector vulnerability assessments in 19 countries to assess the impacts of the global financial crisis on the power sector and identify power projects facing financing shortfalls.

5.1.2.3 Inform Government Policy

Another key role that ESMAP fulfills is to provide policy advice to client countries on strategically important energy sector issues. EASP activities implemented during FY2009-FY2011 demonstrably influenced 18 energy policies in more than a dozen countries. Of these, 14 policies in 10 countries have already been adopted by the governments (see Table 5 for more details) while the remaining are under consideration by the respective governments (see Table 6 for more details). Notable policies and regulations directly influenced by ESMAP activities include policy measures for sustainable development of the coal sector in China, legislation and regulation for electricity markets in Turkey, natural gas sector regulations in Peru, and establishment of an agency for energy efficiency and renewable energy in Morocco.

Table 5: Policies / Programs of Client Countries Influenced by EASP Activities

Country	Name of ESMAP Activity	Type and description of policy, legislation, or regulation influenced by ESMAP activity
China	***China Sustainable Coal Sector Development***	**Policy measures for sustainable development of coal sector** The government has adopted policy measures suggested by this ESMAP activity for the development of a sustainable coal sector in China
Mongolia	***Sector Reform and Tariff Adjustment***	**Policy and regulatory framework for electricity services** Based on the advice from ESMAP's activity, the government has adopted a new policy and regulatory framework for electricity services, including a cost-reflective tariff and billing system, and asset and operational management involving the private sector

China	***Generation Pricing, Trading and Dispatch***	**Framework for efficient power system dispatch services.** Based on the work undertaken with ESMAP's support, the government has issued principles to implement new efficient power system dispatch practices and is piloting them in five provincial grids—Henan, Jiangsu, Guangdong, Sichuan, and Guizhou.
Turkey	***Supporting Electricity Market Operations*** ***Capacity Building for Electricity Market Operations***	**Legislation and Regulation on Electricity Markets** The ESMAP activities have directly informed the following regulation and legislation in Turkey: • Amendments to the electricity market law to monitor, evaluate and take measures to ensure security of supply (Law No. 5784 of July 26, 2008). • Modified balancing and settlement regulations to improve the functioning of the wholesale market (publicly issued in April 2009).
Montenegro	***PPP Options for Electricity Generation***	**Energy Legislation** Based on the ESMAP activity that presented different legal, regulatory, and institutional options for promoting private sector participation, a new energy law has been adopted by the government.
South East Europe	***South East Europe Wholesale Market Opening***	**Regional Electricity Market Framework** The ESMAP activity developed a decentralized regional energy market design, which is to be implemented with national control and regional cooperation, is under consideration by governments participating in the market.
Central America	***Programmatic Approach in Support of the Power Sector in Central America***	**Regional declaration to promote renewable energy and energy efficiency** 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
Peru	***Peru Natural Gas Study***	**Natural Gas Sector Regulations** Based on stakeholder consultations, the ESMAP study assessed Peru's natural gas sector and made recommendations regarding regulatory measures, planning and consumer/sector demand. The government has started to implement policy adjustments supported by the findings of the study.

Egypt	***Energy Pricing Strategy***	**Electricity Tariff Regulation** 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.
Syria	***Syria Electricity Sector Strategy***	**Electricity Law** 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
Djibouti	***Energy Sector Master Plan***	**Measures to reduce technical and non-technical losses** As recommended by ESMAP's activity, the government is improving electricity billing and metering systems and has started to charge industrial customers for reactive power since July 2009.
Morocco	***Energy Supply Strategy***	**Low Carbon Energy Policy** The ESMAP activity helped the government formulate a new low carbon energy policy.
Yemen	***Institutional Framework for Energy Efficiency Program Implementation***	**Energy Efficiency Strategy and 3 year DSM/EE program** Based on the inputs of this ESMAP activity, the government has developed and approved an energy efficiency strategy in June 2009, which sets out the specific energy efficiency target and the broad strategy to achieve it. A three year DSM/EE action plan has also been developed to lay the foundation for a sustainable DSM/EE program to build capacity required for future program implementation.
Africa	***Sub Saharan Africa Refinery Study***	**Upgrade of Fuel Specifications** The ESMAP SSA refinery study: (i) produced coherent projections of petroleum products consumption for all SSA countries, (ii) determined the costs of incremental air pollution in SSA cities, and, (iii) established the relationship between health benefits and fuel/vehicles regulatory policies. The Africa Refiners Association (ARA), at its last 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.

Table 6: Policies / Programs under Consideration by Governments

Country	Name of ESMAP Activity	Type and description of policy, legislation, or regulation influenced by ESMAP activity
Africa	***Southern Africa Power Pool (SAPP) Generation and Transmission Expansion Plan***	**Adoption of SAPP Generation and Transmission Expansion Plan** The Southern Africa Developing Countries Secretariat is following up with energy Ministers in the region for implementation of this activity prepared with ESMAP support.
Vietnam	***Gas Sector Development Framework***	**Gas Master Plan** This ESMAP activity is helping revise Vietnam's Gas Master Plan by providing inputs on international experience in this area; institutional set up; options for gas market pricing; and options on gas market design.
Ukraine	***Thermal Power Plant Rehabilitation Activity***	**Strategy for Thermal Power Plant Rehabilitation** The ESMAP study analyzed the barriers affecting implementation of Thermal Power Plants rehabilitations, 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 will serve as an input in the formulation of government's strategy for addressing the rehabilitation needs of thermal power plants in Ukraine.
Morocco	***Structuring New Energy Agency***	**Establishment of Agency for Development of Energy Efficiency and Renewable Energy** The government is establishing a new Agency for Development of Energy Efficiency and Renewable Energy based on the design prepared as part of this activity.
India	***Best Practice in Energy Efficiency Improvement in Coal Fired Generation* and *Regulatory*** ***Planning Requirement for Rehabilitation of Coal Fired Generation***	**Action Plan Thermal Power Plant Rehabilitation** These two ESMAP activities have 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.

Africa	***WAPP Broadband Program Assessment***	**Leveraging WAPP transmission lines to improve broadband connectivity** This ESMAP technical feasibility study for leveraging the fiber transmission lines on the West Africa Power Pool for broadband connectivity has been prepared and presented at a conference attended by regulators and policy makers from African countries. The Ghanaian government has expressed interest and commitment in pursuing projects that arise out of the study.

5.1.2.4 Build and/or Enhance Client Capacity

ESMAP provides support to client countries to improve their capacity to implement policies/programs 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 sharing international good practice.

During FY2009-FY2011, EASP activities helped enhance client capacity in more than 20 countries. ESMAP's support ranged from preparation of a least cost generation and transmission expansion plan for the Southern Africa Power Pool to assistance in transferring international best practices for rehabilitation of coal-fired generation plants to India mainly through the preparation of an implementation plan. Table 7 below provides details of EASP activities which played a role in building and enhancing client capacity.

Table 7: Capacity Building in Client Countries Facilitated by EASP Activities

Country / Region	Name of ESMAP Activity	Area and description of role of ESMAP activity in Building and / or Enhancing Client Capacity
Africa	***Southern Africa Power Market***	**Implementation of Southern Africa Power Pool** This ESMAP activity helped prepare a least cost Southern Africa Power Pool (SAPP) Generation and Transmission Expansion Plan. This plan is being used by participating countries to implement SAPP.
Africa	***Regulating Electricity Exports and Imports in Southern African Developing Countries***	**Regulation of electricity exports and imports** ESMAP's activity helped prepare guidelines for national regulators and regional and national political authorities in Southern Africa Developing Countries aimed at promoting efficient, large-scale, firm power transactions.

Global	***Country Energy Sector Vulnerability Assessment Program***	**Response to financial crisis** A series of activities undertaken under this ESMAP program have helped assess the impacts of the financial crisis on the power sector in 19 countries and has helped frame both World Bank and government response to the crisis in many countries.
East Asia and Pacific	***Policy and Capacity Building for GMS Power Trade***	**Capacity building for Greater Mekong Sub-region Power Trade** The ESMAP activity has prepared a report describing and comparing international experience, drawing conclusions and useful 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.
India	***Best Practice in Energy Efficiency Improvement in Coal Fired Generation*** ***Regulatory and Planning Requirement for Rehabilitation of Coal Fired Generation***	**Rehabilitation of coal-fired generation plants** These two ESMAP activities have assisted in transferring international best practices in this area to India through a study and through experts' site visits and seminars & workshops. ESMAP has also helped identify the regulatory and planning requirements for rehabilitation of coal-fired generation plants and shared it with the Forum of Regulators.
India	***Organizational Transformation of MSETCL***	**Organizational transformation of MSETCL** The ESMAP activity helped bring about changes in processes and procedures, including organizational re-structuring and implementation of revised business processes. Under the activity, several meetings, workshops and field visits were conducted for dissemination of proposed changes and to obtain feedback on process changes contemplated, which resulted in better design and implementation of the recommended process changes.
Turkey	***Supporting Electricity Market Operations***	**Electricity market operations** ESMAP's activity helped build capacity to implement electricity market regulations including launching of hourly metering and settlement and day ahead electricity market. ESMAP helped organize training for TEIAS staff working in various departments on the operation of capacity mechanisms and capacity auctions.

5.1.2.5 Introduce Cutting-edge Solutions

ESMAP undertakes original analytical work and develops cutting edge solutions to help respond to energy sector challenges of client countries. Cutting-edge solutions are used not only by governments

but also by a wide array of stakeholders including the private sector and nongovernmental organizations.

During FY2009-FY2011, ESMAP created a number of innovative products that will benefit the wider energy practice. For example, ESMAP developed a methodology for measuring the performance of energy utilities and a database of performance indicators of energy utilities in Africa to enable countries to benchmark the performance of their utilities. Table 8 below provides details on cutting-edge solutions introduced to client countries through EASP activities.

Table 8: Cutting-edge Solutions Delivered under EASP Activities

Country / Region	Name of ESMAP Activity	Area and description of role of ESMAP activity in Introducing Cutting-edge Solutions to Clients
Africa	***Utility Performance***	**Monitoring utility performance** By developing an online database and book of utility performance indicators, the ESMAP activity enabled countries in the region to monitor and compare the performance of energy utilities in the region.
China	***Generation Pricing, Trading and Dispatch***	**Generation pricing, trading and dispatch** The ESMAP activity helped undertake a pilot in Shangdong province 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.
Egypt	***Design of Time of Use Tariffs***	**Design of Time of Use tariffs** ESMAP's activity helped design time of use tariff in Egypt, which will be piloted by the government under a World Bank loan.
Global	***Accounting for Risks in Power System Planning***	**Accounting for risks in power system planning** This ESMAP activity has prepared improved power utility planning methods that should help lead to more robust and diverse energy generation mixes in developing country utilities that minimize risk-adjusted supply costs.
Latin America Caribbean	***A Strategic Overview on Energy Procurement and Best Practices in Energy Auctions***	**Energy auctions.** 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.

Latin America Caribbean	***Managing the Impact of High and Volatile Oil Prices***	**Managing the impact of high and volatile oil prices** The ESMAP activity suggests several instruments to manage oil price volatility, including a) financial hedging instruments, b) diversification of the power generation matrix to include more renewables. c) promoting energy efficiency, both among Public Utilities (PROMEF is an example) and consumers and d) promote Electricity Regional Trade.
Latin America Caribbean	***Electricity Security***	**Database of Latin American electricity sector** 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 more comprehensive database will allow more detailed and complete analysis of the electricity sector in the region.
Turkey	***Supporting Electricity Market Operations***	**Capacity and Auction Mechanisms for operation of electricity markets** The ESMAP activity has 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.

5.1.3 Specific Cases of Policy and Operational Impact

While the above section presented an overview of results and outcomes of EASP activities, this section provides specific cases of impacts achieved by EASP activities. Although EASP activities covered a wide range of topics and countries during FY2009-FY2011, the following examples represent some of the most noteworthy high-impact accomplishments.

5.1.3.1 Energy Tariff Design in Egypt

In Egypt, retail tariffs have been kept low as a way of providing social services to households and subsidizing industries to generate employment. However, these low prices have been unable to cover required subsidies and investment in new generation capacity. Financial subsidies in the oil and gas sectors alone consume nearly six percent of GDP. If electricity is added to the mix, the resulting subsidies are as high as 14 percent of GDP, significantly impacting Egypt's budget. In addition to the budgetary costs, artificially low energy prices misallocate resources, hurt the environment, and encourage excessive energy consumption—Egypt's energy and carbon intensity is two-and-a-half to three times higher than the OECD average. The common rationale for instituting untargeted subsidies through energy pricing is to ensure access to affordable energy services, particularly by lower income households. But the benefits of Egypt's current energy subsidy system are highly regressive, mostly enjoyed by the well-off.

To correct this situation, the government requested the World Bank's assistance on several policy tasks including (i) designing a load management program that would reduce demand during peak periods; (2) designing and applying Time of Use (ToU) tariffs; and (3) preparing a comprehensive energy pricing strategy. ESMAP first funded a study that designed cost-reflective ToU tariffs taking into account consumer responses to tariff change. A subsequent ESMAP study developed an energy pricing strategy that reflects the underlying costs of energy while considering the economic and social impacts of price increases, including the effects of subsidy removal on vulnerable customers. The study developed an analytical framework for calculating economically justified levels of energy prices and the fiscal and poverty impacts of the required price adjustments. It also proposed a plan for adjusting energy prices, accompanied by policies to mitigate the social impact of the adjustments.

An important achievement of these studies has been capacity-building of key government agencies in economically efficient tariff design. Additionally, the tariff studies have helped set the stage for more than $1.2 billion worth of World Bank power sector investment operations which are expected to add about 1,500 MW of new generation capacity by 2015. Specific recommendations of ESMAP studies, such as cost reflective tariff design and time of use tariffs, are currently being implemented as part of these investment operations.

5.1.3.2 Vietnam Gas Sector Development Framework

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 2006–2015 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.

ESMAP first assisted the government of Vietnam by supporting a review of 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, method for determining optimal utilization, pricing principles, regulatory methodologies, and market design options—as the basis for specific sector policy decisions. ESMAP also provided follow-up technical support to help the government implement the proposed framework. ESMAP is currently providing assistance for developing a gas pricing methodology and conceptual design of the gas market, including a roadmap for its implementation.

The World Bank is facilitating the implementation of some of the recommendations of ESMAP studies by including them as the tranche release conditions of the Poverty Reduction Strategy Credit 10 for Vietnam.

5.1.3.3 India State Electricity Transmission Company Restructuring

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 from the World Bank for strengthening the Maharashtra State Electricity Transmission Corporation Limited (MSETCL). 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.

It was against this background that ESMAP, together with the Public-Private Infrastructure Advisory Facility (PPIAF) and the World Bank, launched an assistance program for MSETCL. Building on work undertaken by PPIAF, ESMAP provided support for business re-engineering and strengthening institutional capacity of MSETCL, including the capacity for managing public-private contracts and implementing policies to upgrade human resources. MSETCL is now implementing a detailed Project Monitoring & Review Process and a well-defined Strategic Communication Framework between contractors and MSETCL. This involved 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 empowers decentralized staff at field levels. After a year of implementation and continued management support to transformation initiatives, the change is now permeating across all employee levels in the organization.

These reforms have also helped MSETCL attract financing from the International Finance Corporation (IFC) without any state guarantees. 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 IFC loan support, recommendations were made for improving corporate governance practices and the development of a systematic framework for addressing environment and social issues. MSETCL appointed full-time directors to the company's board through a competitive process and included independent directors and appointed a non-executive Chairman.

5.1.3.4 Turkey Electricity Market Operations

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 Communitaire 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.

ESMAP has supported these reforms through a series of activities to assist the government in establishing the framework and capacity for a competitive electricity market, to be run by the Turkish Electricity Transmission Corporation (TEIAS). In phase one, ESMAP funded 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. 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.

In phase two, 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.

ESMAP's engagements with Turkey have helped catalyze an increase in World Bank lending for Turkey. World Bank energy lending to Turkey increased 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 World Bank investment operations, as well as helping build capacity in government agencies. ESMAP reports have been used as inputs to the ongoing policy dialogue supported by World Bank energy policy loans and for designing investment operations in the country.

5.1.4 EASP Activities with Limited or Unobservable Results

Of the 59 completed EASP activities covered in the analysis, direct results and outcomes could not be tracked or observed for 9 activities (see Table 9). This was due to a number of factors, including (i) delay in the delivery of outputs; (ii) change in political and institutional context of activities; (iii) poor quality of outputs; and, (iv) insufficient passage of time since the completion of the activity.

Table 9: EASP activities with Limited or Unobservable Results

ESMAP Activity	Completion Year	Country/Region	Status of Results/Outcomes
Oil Supply Logistics and Security for small, oil-importing African countries	2010	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 the report compromised its relevance, as oil prices fell and additional oil was discovered in the client countries.
Iran: Electricity Pricing and Power Sector Reform	2009	Iran	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 restrictions 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.
Regional Power Trade	2009	South Asia	A study that highlights potential and prospects for energy trade, analyzes the factors which have inhibited the trade so far and takes note of the emerging favorable trends in the region, was shared with governments in the region. However, it is not clear yet if the report has been successful in influencing governments in any of the countries
Environmental Issues in the Power Sector-Consequences of Coal Based Generation	2010	Sri Lanka	A study that undertakes quantitative analysis to help decision-makers assess various power sector policy options in terms of the trade-offs between the environment, costs and other impacts, has been prepared. However, there is no evidence yet that the government has incorporated this analysis in its decision-making or of this study having influenced government policy/strategy.
Support to Develop Strategy for the Government's Public Transport Sub-sector	2010	West Bank and Gaza	There has only been a modest improvement in the capacity of 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.

GEA Background Energy Papers	2010	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.
NOCS Case Studies	2010	Global	Case studies to help improve the understanding of factors that affect the performance of National Oil Companies have been prepared. Since the case studies were only completed at the end of 2010, it is still too early for results and outcomes to be observed.
SSA Downstream Petroleum Efficiency Study	2010	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.
Energy Environment and Population – Phase II	2010	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 yet evident whether the activity has been successful in meeting its objectives.

5.2 ESMAP Portfolio of Energy Access Activities

5.2.1 Overview of the Energy Access (EA) Portfolio (FY2009-FY2011)

This section discusses energy access activities carried out and implemented by ESMAP during the FY2009-2011 period. *Energy Access* comprises a variety of activities including:

- *Energy SMEs, which* includes activities that seek either to involve small and medium enterprises (SMEs) as electricity providers or to motivate SMEs to use more electricity for income-generation activities;
- *Strategy development* which aim to develop energy access strategies and action plans;
- *Gender & Energy* which refer to activities carried out through the Gender and Extractive Industries Program (managed by the World Bank's Oil, Gas, and Mining unit) and ESMAP's Gender and Energy Development Strategies (GEDS) Program, with the objective of integrating gender into energy policies, strategies and programs of ESMAP's client countries;
- *Biomass Energy,* which covers supply and demand–side biomass energy activities;
- *Rural electrification programs and impacts,* activities related to monitoring and evaluation (M&E) tools for assessing rural electrification impacts;
- *Lighting Africa*, a program that aims to accelerate the development of commercial off-grid lighting markets in Sub-Saharan Africa as part of the World Bank Group's wider efforts to improve access to energy.

The FY2009-2011 energy access portfolio includes 54 activities with grant disbursement totaling about US$23 million (see Annex for complete list of ESMAP EA activities). The majority of the activities were carried out by World Bank regions and other units through ESMAP's Annual Block Grants and the Africa Renewable Energy Access (AFREA) trust fund[4], which is supported by the Kingdom of Netherlands through the ESMAP Clean Energy Investment Framework Multi-Donor Trust Fund (ESMAP CEIF-MDTF). Figures 2 a and b provide a breakdown of the number of activities by region and disbursement amount.

AFREA-funded activities constitute a significant portion of ESMAP's FY2009-2011 energy access portfolio. As of February 2011, the AFREA program, managed by AFTEG , the World Bank energy unit in the Africa region, allocated about US$16.7 million[5] - 67% of the total ESMAP energy access funding - to implement 18 activities, two of which, the *Africa Electrification Initiative,* and *Implementing the Action Plan for Energy Access Scale-up in Africa* were initially funded from ESMAP's Annual Block Grants. Since AFTEG started managing the AFREA trust fund in February 2009, almost all AFREA activities (17 activities) are ongoing. Unlike the Annual Block Grants-funded activities that are executed by the World Bank, the AFREA portfolio includes eight recipient-executed activities that directly provide either co-

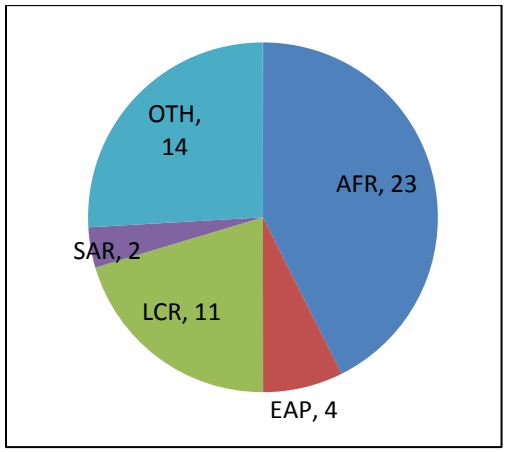
[4] The Ministry of Foreign Affairs (DGIS) of The Kingdom of Netherlands allocated US$ 28.75 million equivalent fund to the ESMAP Clean Energy Investment Framework Multi-Donor Trust Fund (ESMAP CEIF-MDTF) to support deployment of renewable energy systems in Sub-Saharan Africa. ESMAP and AFTEG signed 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).

[5] Of the US$16.7 million, US$850,000 was allotted for program management and supervision of both Bank-executed and Recipient-executed activities.

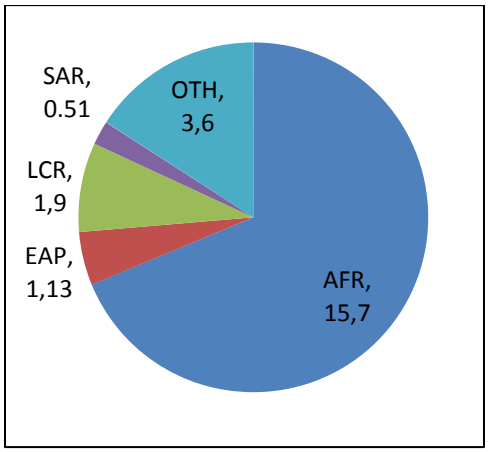
financing to IDA and GEF projects or recipient grants to expand access to modern energy. AFTEG-managed activities, which include AFREA-funded activities and other activities funded under the Annual Block Grants, make up the largest share of ESMAP's FY2009-2011 energy access portfolio.

Figure 6: ESMAP Energy Access Activities by World Bank Region / Department

a) By Number of Activities



b) By Disbursement ($ Million)



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

The breakdown of the assessed portfolio according to the nature of the activity (product line) is as shown in Table 10 below (for description of product lines and output types please refer to Annex 2).

Table 10: Energy Access Portfolio Breakdown by Product Lines, Output Type and Region

Of the total of 54 activities, 17 have been completed and delivered to clients while the remainder is still ongoing, with delivery to client expected either in FY2011 or FY2012. Only completed activities were

Product Line and Output Type /Region	AFR	EAP	ECA	LCR	MNA	GLB	SAR	Grand Total
Energy Sector Work								
Policy Note	1							**1**
Report	2			1		1	1	**5**
Knowledge Product								
Databases								
Operational Guide								
Studies				5		2		**7**
Partnership				1		6		**7**
Technical Assistance Non-Lending								
"How-To" Guidance	8	2		3		4		**17**
Client Document Review	1							**1**
Institutional Development Plan		1					1	**3**
Knowledge-Sharing Forum	3	1		1				**5**
Other (GE, PE,RE)	8					1		**9**
Grand Total	23	4		11		14	2	**54**

considered for the assessment of outcomes and results that follows.

5.2.2. Assessment of Outcomes and Results

Despite the "upstream" nature of most ESMAP activities, the portfolio assessment reveals that 12 completed energy access activities have informed World Bank Group lending operations; contributed to enhancing governments' regulations and capacities; and introduced cutting-edge solutions. In particular, some activities to promote the involvement of small and medium enterprises in the provision of electricity to rural areas, as well as those to prepare energy access scale-up plans, have had greater impacts, with noteworthy cases in Tanzania, Rwanda, and Kenya.

The following section discusses the results of completed activities of the Energy Access portfolio measured under four outcomes: (i) influence Bank lending and energy strategies, (ii) inform government policy, (iii) build or enhance client capacity, and, (iv) introduce cutting-edge solutions.

5.2.2.1 Influence Bank Lending

Many ESMAP FY09-FY11 activities have played a role in influencing World Bank Group energy and mining projects totaling about $2.05 billion in financing. Energy SME activities have informed the design of World Bank energy access projects in Peru, Nicaragua, Cambodia, Lao PDR, Burkina Faso, and Cameroun, whereas gender and energy activities have contributed to mainstreaming gender considerations in World Bank-financed energy & mining projects in Senegal, Papua New Guinea, Tanzania, Mongolia, and Democratic Republic of Congo. Likewise, the ESMAP-funded *Africa scaling up energy access action plan* has influenced Rwanda and Kenya energy projects. Table 11 below provides the complete list and description of World Bank Group lending operations informed by ESMAP EA activities.

Table 11: List of World Bank Group Lending Projects Influenced by ESMAP's Energy Access Activities

Country	Name of ESMAP Activity	WB Lending Project (FY, $) and ESMAP's Role
Peru	***Small and Medium Enterprises (SMEs) for Energy Services Delivery***	***Peru- Rural Electrification Project ($47 M)*** The ESMAP activity provided socio-economic and energy data that was needed to re-orient the national rural electrification program. The activity informed the above loan, which later included two components promoting SMEs involvement: (i) investment in rural electrification sub-projects by private and state-owned enterprises and (ii) technical assistance to develop the regulatory and legal framework, build capacity, and promote private sector investment. **Related WBG lending prior to ESMAP activity:** Prior to the ESMAP activity, the World Bank-financed Peru – Rural Electrification Project was under preparation. No other World

		Bank energy access projects with components to promote SMEs involvement in rural electricity provision were underway.
Nicaragua	***Technical Assistance for Improved Small-scale Energy Supply***	***Off-Grid Rural Electrification Project ($16 M)*** Prior to this ESMAP activity (November 2000), ESMAP had sponsored a workshop on off-grid electrification mechanisms that resulted in the initiation of the above loan. The ESMAP activity "*Technical Assistance for Improved Small-scale Energy Supply***"** further contributed to preparation of the World Bank project by assisting CNE, Nicaragua's National Energy Commission, to formulate policies and strategies conducive to private involvement in providing rural areas with electricity generated from renewable energy. **Related WBG lending prior to ESMAP activity:** The 2000 workshop sponsored by ESMAP catalyzed the initiation of the first WBG lending operation in this country.
Cambodia	***Decentralized Energy Services for IDA countries***	***Cambodia-Rural Electrification and Transmission Project, (includes a rural electrification fund component - US$5.1 million from World Bank financing)*** ESMAP helped develop a renewable energy action plan conducive for private sector involvement and supported extensive consultations that led to the proposal for a rural electrification fund. This activity informed the design of the World Bank-financed Cambodia-Rural Electrification and Transmission project to implement an innovative mini and off-grid electrification program, with the off-grid component being implemented through rural electrification enterprises. ESMAP's energy SME activity complemented the off-grid component of the Rural Electrification and Transmission project by supporting the development of rural energy enterprises. The activity trained an estimated 150 managers and technicians from rural electrification enterprises and included technology promotion pilots that led to the dissemination of 2,000 LED lanterns and 8,000 improved cook stoves, as well as to the installation of 12 gasifiers for electricity generation from biomass. **Related WBG lending prior to ESMAP activity:** Prior to ESMAP's energy SME activity, there was only one World Bank energy-SME-related lending project.
Lao PDR	***SMEs in Decentralized Energy Service***	***Rural Electrification Project (FY10, $0.5 M grant from ESMAP, $20 M IDA, $3.88 M IFC)*** ESMAP provided a half million dollar grant to finance the second phase of the Rural Electrification project approved in January 2010. ESMAP has, thereby, contributed to leveraging US$20 million from IDA and US$3.88 million from IFC. ESMAP's support aims to scale up the socio-economic impacts of rural

		electrification by assisting small and medium enterprises to increase electricity use for income generation activities. **Related WBG lending prior to ESMAP activity:** In the five years before ESMAP-funded activity, the only World Bank energy lending project with SMEs activities was Phase 1 of the Rural Electrification project (World Bank financing: US$13.75 million), which included an assessment of linkages between income generation and village-level off-grid electrification.
Burkina Faso	***Capacity Building among Small Scale Energy Suppliers***	***Burkina Faso Energy Access Project (FY08, $0.8 M)*** Following the ESMAP SME activity, the World Bank approved, in July 2007, the Burkina Faso Energy Access Project, which includes a US$0.8 million sub-component to strengthen the capacities of energy services cooperatives, local communities, NGOs, and small- and medium enterprises (SMEs). **Related WBG lending prior to ESMAP activity:** Before the ESMAP-funded activity, there were no World Bank energy lending projects promoting the involvement of SMEs to supply electricity.
Cameroun	***Capacity Building among Small-Scale Off-Grid Energy Suppliers***	***Cameroun-Energy Sector Development Project (FY08, $40 M)*** The ESMAP activity analyzed the regulatory, legal, and institutional framework of the energy sector in Cameroun, and recommended that the government review the functions of the rural electrification agency and established a rural energy fund to facilitate SMEs participation in electricity provision. ESMAP further supported the development of an operational manual for the proposed rural electrification fund. Building on ESMAP's support, the World Bank-financed Cameroun-Energy Sector Development Project was prepared which includes a US$ 40 million rural energy fund to provide investment subsidies to rural energy projects. The rural energy fund was established on December 14, 2009 and first private sector-led projects are still under preparation. **Related WBG lending prior to ESMAP activity:** Prior to the ESMAP activity there were no World Bank energy lending projects with SME activities.
Bolivia	***Strengthening Small-Scale Off-Grid Energy Suppliers***	***Decentralized Infrastructure for Rural Transformation Project (IDTR) (US$20 M)*** Before the ESMAP activity was carried out, the *Decentralized Infrastructure for Rural Transformation Project (IDTR)* World Bank-financed project was under implementation; it included a solar PV market development sub-component to improve access to electricity in rural areas. The ESMAP activity *Strengthening Small-Scale Off-Grid Energy Suppliers* complemented the IDTR project by assisting the government in developing a new market for "Pico-PV" technologies, targeting the rural poor. The activity also improved medium-term service contracts that were used to select SMEs to supply solar home

		systems to households. It also contributed to leverage GPOBA funding, through the GPOBA-financed Decentralized Electricity for Universal Access project, to disseminate 2,000 "Pico PV" systems. **Related WBG lending prior to ESMAP activity:** As stated above, the ESMAP activity complemented the IDTR project which was under implementation at the time.
Rwanda and Kenya	***Implementing the Action Plan for Energy Access Scale-Up in Africa*** **(Funded by ESMAP and AFREA)**	***Rwanda Electricity Access Scale-up and Sector Wide Approach Development Project ($228 M in donor funding)*** ***The Kenya Electricity Expansion Project (FY2010, mobilization of US$1.5 billion in donor funding)*** The activity introduced a sector-wide approach to increasing electricity access and assisted the governments of Rwanda and Kenya to develop energy access scale-up plans, using GIS-based lowest-cost spatial planning. On this basis, the Governments set up their electricity access targets and secured donor commitments to these targets. The World Bank-financed Rwanda Electricity Access Scale-up and Sector Wide Approach Development project mobilized US$228 million in donor funding for energy access. The Kenya Electricity Expansion Project, approved in May 2010, mobilized US$1.5 billion donor funding for 300,000 electricity connections (including in rural and slum areas), scale-up of clean geothermal energy, and strengthening electricity transmission and distribution network, making it the most ambitious access expansion program currently implemented in Sub-Saharan Africa. **Related WBG lending prior to ESMAP activity:** Prior to the ESMAP and AFREA-funded activities, there were no World Bank-financed projects promoting energy sector-wide planning in Rwanda and Kenya. There were, however, a number of donor activities financing energy access, but they lacked a unifying framework. This fragmentation of activities had high costs for government coordination and did not allow possible economies of scale.
Senegal	***Gender & Energy (Funded by AFREA)***	***Second Sustainable and Participatory Energy Management project (PROGEDE II) ($15 M)*** AFREA, through its *Gender & Energy* activity, provided technical assistance during the preparation of the phase II of the Senegal - Second Sustainable and Participatory Energy Management project (PROGEDE II), which now includes two sub-components targeting women. Gender is explicitly stated in the project development objective, namely: "*to contribute to increase the availability of diversified household fuels in a sustainable and gender equitable way, and to contribute to increase the income of participating communities while preserving the forest ecosystems".* **Related WBG lending prior to ESMAP activity:** Prior to AFREA-funded activity, few World Bank energy projects with a specific

		gender component. The first phase of the Senegal - Second Sustainable and Participatory Energy Management project (PROGEDE I), which included specific gender activities and was completed in 1997
Papua New Guinea, Tanzania, Mongolia, and Democratic Republic of Congo	***Gender Dimensions of the Extractive Industries***	ESMAP's seed funding support to the World Bank Oil and Mining Unit's Gender and Extractive Industries Program, which developed a guidance note to address gender issues related to the mining sector - *Gender Dimensions of the Extractive Industries* - has informed the design of all mining projects since FY08. These include, for example, the following four mining projects (leveraging US$23.5 million in Bank financing): 1) **Papua New Guinea – Second Mining Sector Institutional Strengthening TA**: The project's Component 2 (IDA: US$8.19 million) will develop a national Women in Mining (WIM) Action Plan and a youth internship program that will be implemented by the Mineral Resources Authority. 2) **Tanzania - Sustainable Management of Mineral Resources:** Two sub-components - Extension Services for Artisanal and Small-scale Mining communities (US$4.8 million) and Environmental and Social Management (US$2.3 million) – include gender-related activities. 3) **Mongolia – Mining Sector Technical Assistance Project,** which will support gender-sensitive reforms in the mining sector to protect women from discrimination and promote employment equity. 4) **Democratic Republic of Congo** -Growth with Governance in the Mineral Sector (approved in July 2010): The project (total IDA: US$10.5 million) includes activities to facilitate gender inclusion in mining benefit sharing and to pilot innovative approaches to gender and child labor issues. **Related WBG lending prior to ESMAP activity:** None
Tanzania	***Lighting Rural Tanzania (funded by AFREA)***	***Tanzania Energy Development and Access Expansion Project ($24 M)*** Based on the success of the Lighting Africa Development Marketplace, the Tanzanian Rural Energy Agency (REA) has integrating modern lighting solutions into its energy access interventions. AFREA-financed *Lighting Rural Tanzania* provides grants to 10 sub-projects with innovative business models for the delivery of off-grid lighting in rural areas of Tanzania over the upcoming 12 months. This activity has helped raise awareness about modern lighting alternatives to kerosene in Tanzania, and as a result, REA has now included support to modern lighting as eligible activities under the Word-Bank financed Tanzania Energy Development and Access Expansion Project ($24 M). **Related WBG lending prior to ESMAP activity:** None

Peru, Ghana and Nicaragua	***The Challenge of Rural Electrification: Strategies for Developing Countries***	***Ghana Energy Development and Access Project ($90 M)*** ***Peru Rural Electrification Project ($10 M)*** ***Nicaragua Off-grid Rural Electrification Project ($4 M)*** The project appraisal documents of the Ghana Energy Development and Access project and the Peru Rural electrification project mention that the lessons learned[6] from successful rural electrification case studies, compiled in ESMAP's publication - *The Challenge of Rural Electrification: Strategies for Developing Countries* - have been reflected in the project design. Also, the ESMAP-developed methodology to assess the impacts of rural electrification projects was used to conduct the cost-benefit analysis of the Nicaragua Off-grid rural electrification project.

Four of the World Bank loans which were influenced by upstream ESMAP Energy Access activities have already shown specific development impacts. Table 12 below summarizes the impact of these loans at the country level.

Table 12: Impact of World Bank Group Loans Influenced by ESMAP Energy Access Activities

Country	Lending Project (S)	Impact of Bank Loans
Cambodia	Rural Electrification and Transmission Project ($5.1 M financing component)	10,563 additional rural household connections. Over 250 Rural Electrification Enterprises provide electricity, of which 151 provide electricity 24 hours/day. Increase of 2.32% in the national generation capacity from renewable energy

[6] The key lessons of the ESMAP report include the importance of establishing an effective implementing agency dedicated to rural electrification; placing a strong emphasis on cost recovery, with price levels sufficient enough to make rural distribution companies financially sustainable for the design of the system; subsidies targeting connections, not consumption; establishing rural electrification schemes should have clear selection criteria; reducing the initial connection fee or spread it over a period of several years in order for connections to be affordable; focusing on ways to reduce construction and operating costs while maintaining service quality; and, allowing both grid-based, and off-grid alternatives to co-exist and complement each other for rural electrification policies.

Nicaragua	Nicaragua – Off Grid Rural Electrification project ($46.62 M financing component)	Four (4) firms accredited as vendors of Solar home Systems, and five (5) indigenous communities are beneficiaries of solar Battery Charging Centers Increased the mini-grid installed capacity of 1,308 kW 9,656 new connections Six (6) microfinance institutions provided US$1.2 million to 2,314 persons in the project areas
Peru	Rural Electrification Project ($ 60 M, $ 46.62 financing component)	56,268 new connections outside existing concession areas. A number of norms, regulations and guidelines related to rural electrification projects have been issued for conventional grids (80% achieved) and for renewable systems (75% achieved).
Rwanda	Rwanda Electricity Access Scale-up and Sector Wide Approach Development ($ 70 M, $ 51 M financing component)	148,000 households connected to electricity

5.2.2.2 Influence Bank Energy Strategies

Energy Access activities have influenced Bank energy strategies and work programs for Rwanda, Kenya, Papua New Guinea, and the Philippines (Table 13).

Table 13: World Bank Energy Strategies Influenced by Energy Access Activities

Country /Region	Name of ESMAP Activity	Strategic Area and Influence of ESMAP activity
Rwanda and Kenya	***Implementing the Action Plan for Energy Access Scale-Up in Africa*** ***(Funded by ESMAP and AFREA)***	**Strategic Area:** World Bank's Energy Strategy for Rwanda and Kenya **ESMAP influence:** This ESMAP and AFREA-funded activity introduced a sector wide approach in preparing national electricity access programs in Rwanda and Kenya. The subsequent Rwanda's Country Assistance Strategy points 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. The Kenya 2010-2013 Country Partnership Strategy also indicates that the World Bank will follow a sector wide approach in different sectors including the energy sector.

Papua New Guinea	***Women in Mining Conference***	**Strategic Area**: Inclusion of Gender in the CAS for Papua New Guinea[7] **ESMAP influence:** The ESMAP-initiated Women and Mining Program in Papua New Guinea, later financed by a World Bank project, the Japan Social Development Fund, and the Pacific Facility, has led to gender being included as one of the two cross-cutting themes of the latest Papua New Guinea's Country Assistance Strategy.
Africa	***Household Energy Paper* (ESMAP)** ***Modern Biomass Energy Opportunities for Sub-Saharan Africa*** ***(AFREA)***	**Strategic Area**: World Bank Group's energy strategy **ESMAP influence:** Both activities are providing background knowledge for the development of World Bank Group's overall energy strategy. ESMAP, in collaboration with the World Bank's Energy Anchor unit, issued the first draft of the *Household Energy Access for Cooking and Heating* paper. The AFREA-funded *Issues Paper on Modern Biomass Energy Opportunities for Sub-Saharan Africa* provided background content for the forthcoming update of the AFTEG Energy Strategy, as well as to the new Bank wide energy strategy which is expected to be issued soon.
Philippines	***Rural Electrification and Development in the Philippines: Measuring the Socioeconomic Benefits***	**Strategic Area**: Impact evaluation of World Bank rural electrification projects **ESMAP influence**: This activity promotes new approaches for measuring the benefits of rural electrification projects. It has influenced the impact assessment of rural electrification projects conducted by the World Bank's Independent Evaluation Group (IEG). A 1994 IEG report – *Rural Electrification in Asia* - argued that claimed benefits from World Bank's rural electrification projects were not realized and the project costs imposed a financial burden on electricity providers. In response to this concern, ESMAP carried out a study in the Philippines, which proposed a new methodology that more adequately captures the socio-economic benefits of rural electrification. The methodology was published in 2002, in the "*Rural Electrification and Development in the Philippines: Measuring the Socioeconomic Benefits*" book and has triggered greater attention to the methods for evaluating the impacts of rural electrification programs. IEG endorsed ESMAP's methodology and used it to re-assess the costs and benefits of over 100 World Bank-financed rural electrification projects. In its 2008 publication - *the Welfare Impact of Rural Electrification: a reassessment of the costs and benefits* – IEG found that rural electrification could generate sufficient benefits to households and that the value of these benefits was above the average long-run supply costs.

[7] ESMAP gender activities may have influenced other countries' CAS but that potential impact is difficult to determine. An increasing number of CAS incorporates gender issues. The World Bank's FY09 annual monitoring report[7] on gender mainstreaming reveals that 19 out of 23 CAS products reviewed in FY09 (83%) analyzed gender issues and proposed actions in one or more sectors, compared with 9 out of 16 (56%) in FY06 and 18 out of 30 (60%) in FY08. Since the CAS covers many sectors, establishing linkages between the increased gender consideration in CASs and ESMAP upstream gender-energy activities was not evident.

5.2.2.3 Inform Government Policy

ESMAP's activities to facilitate the involvement of SMEs in rural electrification have contributed to enhancing policy and regulatory frameworks in a number of countries. They have led to over 250 SMEs providing electricity in rural areas of Tanzania, Guinea, and Cambodia because of licensing and power purchase agreements that have been developed. Table 14 below provides a detailed description of policies and programs influenced by ESMAP's Energy Access Activities.

Table 14: Policies / Programs Informed by ESMAP's Energy Access Activities

Country	Name of ESMAP Activity	Type and description of policy, legislation, or regulation influenced by ESMAP activity
Tanzania	***Integrating SMEs in Tanzania's Rural Energy Initiatives***	**Policy and regulatory framework for electricity services** Tanzania EWURA, the national Energy and Water Utilities Regulatory Authority, formally adopted, in 2009, the power purchase agreements (PPAs) and simplified tariff setting mechanisms that ESMAP's SMEs activity developed. Furthermore, EWURA expanded on this initial work and developed as well as issued "process" and "interconnection" Guidelines for Small Power Producers (SPPs). Under this favorable regulatory 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.
Guinea	***Scaling up SMEs Participation in Rural Electrification***	**Regulatory framework for electricity & rural energy access strategy** This ESMAP-funded SME technical assistance helped the Guinea's Decentralized Rural Electrification Office establish transparent and reliable licensing and regulation system for energy SMEs, and prepare a rural energy access strategy that is conducive to the involvement of energy SMEs. The ESMAP activity has contributed to 12 private operators, 13 training consulting firms and 2 installation firms operating in Guinea.
Cambodia	***ESMAP Decentralized Energy Service***	**Policy and regulatory framework of electricity services** The Power Purchase Agreements (PPAs) that ESMAP helped develop were used to provide electricity supply licenses to over 250 rural electrification enterprises. 151 rural electricity enterprises, representing 63% of the total REEs, have been providing electricity 24 hours/day.

Peru	***Small and Medium Enterprises for Energy Services Delivery***	**Policy and regulatory framework of electricity services for SMEs** ESMAP recommendations to improve the tariff structure to allow solar PV SMEs to recover their operational costs have led to the regulator establishing a special tariff category to address the situation. In addition, through the World Bank-financed Peru- Rural Electrification Project, the government has issued a number of norms, regulations and guidelines to scale up rural electrification.
Burkina Faso	***Capacity Building among Small Scale Energy Suppliers***	**Policy and regulatory framework for electricity services** This activity, which has been complemented by capacity development and institutional strengthening activities under a subsequent World Bank energy access project, has resulted in a revised Electricity Law that includes private sector involvement mechanisms. Furthermore, the government has established an independent electricity regulatory authority in April 2010.

5.2.2.4 Build and/or Enhance Client Capacity

Through activities funded under the annual block grants and the AFREA trust fund, ESMAP has assisted client countries to improve their capacity to implement policies/programs and strengthen institutions. Some examples include establishing a rural and renewable energy agency, supporting innovations and the private sector to increase access to non-fossil based lighting products, and providing knowledge that helps clients develop action plans to mainstream gender dimensions in energy and mining projects. Table 15 below provides details of specific ESMAP energy access projects which have helped to increase client capacity.

Table 15: Capacity Building in Client Countries Facilitated by Energy Access Activities

Country / Region	Name of ESMAP Activity	Area and description of role of ESMAP activity in Building and / or Enhancing Client Capacity
Liberia	***Catalyzing New Renewable Energy in Rural Liberia*** **(funded by AFREA)**	**Energy regulatory framework** This AFREA-funded activity was launched in July 2009 with the aim of implementing an important piece of the Government's 2009 National Energy Policy by supporting the establishment and capacity building of Liberia's Rural and Renewable Energy Agency (RREA). The activity provided technical assistance and advisory services that resulted in President Ellen Johnson Sirleaf issuing an Executive Order establishing the RREA and its associated Rural Energy Fund as a legal entity, in January 2010. The RREA has been staffed

		and operational since April 2010, with capacity building activities ongoing. With AFREA co-financing, the RREA has secured additional grant financing from the EU Energy Facility to launch its Rural Energy Master Plan, intended to utilize GIS technology for spatial analysis; the Facility will also finance expansion of the SSMP pilot to additional counties of Liberia.
Papua New Guinea, Tanzania, and Bangladesh	***Gender and Energy***	**Gender mainstreaming in the energy sector** In **Papua New Guinea, Tanzania, and Bangladesh**, ESMAP's contribution to gender, energy, and mining workshops has led to governments' actions. The Papua New Guinea government prepared and approved, in December 2009, a five-year action plan for Women in the Mining Areas, where as the Government of Tanzania is developing an Action Plan on gender in the extractive sector. Following a three-day ESMAP-funded capacity building workshop on gender and energy, held in Bangladesh (where 86% of the participants rated good to excellent the usefulness of the information provided), counterparts from Bangladesh, India, Nepal, Pakistan, and Sri Lanka have been developing actions plans to mainstream gender consideration in energy projects.
Africa	***Lighting Africa & Lighting Africa Development Marketplace***	**Implementation of lighting projects in Sub-Saharan Africa** Lighting Africa, through its pilots and support to private sector, has contributed to increased access to LED lanterns and lighting products. Lighting Africa Development Marketplace provided grant and supervision co-funding to implement innovative off-grid lighting pilot projects in 11 countries in Sub Saharan Africa. As a result, 42,000 LED lanterns and lighting products were distributed, benefiting 8,450 households and 331 organizations that gained access to improved lighting products and services and created 123 new jobs.

5.2.2.5 Introduce Cutting-Edge Solutions to Client

ESMAP undertakes original analytical work and develops cutting edge solutions to help respond to energy sector challenges of client countries. Cutting-edge solutions are used not only by governments but also by a wide array of stakeholders including the private sector and nongovernmental organizations.

During FY2009-FY2011, ESMAP created a number of innovative products that will benefit the wider energy practice. ESMAP has introduced cutting-edge solutions in Tanzania, Rwanda, and Kenya, through the Tanzania Energy SME activity and the *Scaling-up Africa Energy Access Action Plan* work. Also, *Lighting Africa* has contributed to boosting the commercialization of cutting-edge lighting technologies and is informing ongoing United Nations initiatives. Table 16 below provides details on cutting-edge solutions delivered under Energy Access Activities.

Table 16: Cutting-edge Solutions Delivered under Energy Access Activities

Country / Region	Name of ESMAP Activity	Area and description of role of ESMAP activity in Introducing Cutting-edge Solutions to Clients
Tanzania	***Lighting Rural Tanzania***	**Regulatory framework** In Tanzania, ESMAP-assisted light-handed licensing and power purchase agreements have been considered good practices in Eastern Africa. This pioneering work has been disseminated for possible adoption to other African countries. For example, 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).
Rwanda and Kenya	***Implementing the Action Plan for Energy Access Scale-Up in Africa***	**Geographic Information Systems in support of electricity access** The use of geographic information tools to determine grid electrification plans in the electricity access program prospectus that ESMAP's AFTEG Annual Block Grant and AFREA funded in Rwanda and Kenya, 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 rollout grid electrification up to 2020.
Africa	***Lighting Africa***	**Dissemination of quality lighting products / harmonization of quality assurance systems** Lighting Africa has contributed the dissemination of quality lighting products, using cutting edge technologies, such as latest LEDs. Lighting Africa Associates, companies whose products successfully passed Lighting Africa quality tests, have experienced a 93% growth in sales in the last six months, reporting 84,324 solar powered lights sold, as compared to 90,290 solar portable lights in the prior year (e.g. over a 12 month period). Lighting Africa Associates acknowledged that Lighting Africa support was instrumental in the sale of close to 200,000 Lighting Africa quality-approved lights by December 2010. Moreover, Lighting Africa chaired the GEF/UNDP En.lighten Project Steering Committee, leading efforts to harmonize quality assurance systems across different organizations and continents to promote market transformation. UNFCCC used the Lighting Africa-developed, quality specifications and testing procedures to build up the CDM methodology for off-grid lighting, which was announced in Cancun.

5.2.3 Specific Cases of Policy and Operational Impact

The following section provides two cases where ESMAP energy access activities have yielded noteworthy impacts.

5.2.3.1 Light-handed Power Purchase Agreements in Tanzania

ESMAP energy SME activity in Tanzania has empowered the regulatory authority to develop light-handed power purchase agreements and procedures that have enabled private operators to provide electricity in rural areas. Nearly eight out of ten Tanzanians do not have access to electricity, although the country has abundant water, wind, sunshine and various forms of biomass.

ESMAP helped EWURA, Tanzania's Energy and Water Utilities Regulatory Authority, establish a conducive framework to attract private investments to light up rural areas, where most of the Tanzanian population lives and where poverty rates are highest. It contributed to developing standardized power purchase agreements (PPAs) and simplifying tariff setting mechanisms for small power projects promoted by private operators.

EWURA formally adopted, in 2009, the power purchase agreements (PPAs) and simplified tariff setting mechanisms. It further expanded on this initial work by developing and issuing "process" and "interconnection" Guidelines for Small Power Producers (SPPs). EWURA plans to formalize these Guidelines in regulatory rules.

The favorable regulatory framework for SPPs has been enhanced through the World Bank-financed Energy Development and Access project and has already led to results. 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 is the Kilocha project which will soon produce and supply 12 MW of electricity to 1,500 rural households and supply 9MW to the national grid. Also, the Mbinga Mtambazi hydro project will supply about 500 KW of electricity to 900 households in three off-grid villages.

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.

5.2.3.2 Energy Access Prospectus in Rwanda and Kenya

The ESMAP-supported "Implementing the Action Plan for Energy Access Scale-Up in Africa" activity has not only informed the design of World Bank-financed energy access projects, but has also been instrumental in mobilizing $228 million and $1.5 billion to implement energy access programs in Rwanda and Kenya respectively. The activity covers a number of interventions, including the development of a sector-wide approach (SWAp) to scale-up electricity access in Sub-Saharan Africa. The SWAp approach implies that it is government led, is underpinned by a policy and institutional reform program, has stretch targets for improved reliability, connectivity and supply, and has a fully estimated and funded investment program. Through this activity, ESMAP assisted Rwanda and Kenya to develop comprehensive, sector-wide access expansion programs, with the use of new, innovative planning tools, including geospatial access planning, least-cost financing program and a sector financing model.

The activity was instrumental in mobilizing funding from the development community. At a donor round table held on March 23, 2009, in Kigali, partners and sector institutions pledged contributions totaling US$228 million to implement the ESMAP-proposed five-year energy access program for Rwanda. Similarly in Kenya, the prospectus was presented on October 22, 2009 at a donor conference, where development partners confirmed funding of US$1.5 billion for the Program.

5.2.4 Energy Access Activities with Limited or Unobservable Results

Of the 17 completed ESMAP energy access activities covered in the analysis, direct impacts could not be tracked for nine of them. The limited or no observable impacts of those activities can be explained by a number of reasons, including: (i) recent dissemination of outputs, (ii) activity sector was not among the government's top priorities, (iii) change in political and institutional context of activity, and (iii) insufficient information to track impacts. More details are provided in Table 17.

Table 17: Energy Access Activities with Limited or Unobservable Results

ESMAP Activity	Completion Year	Country/Region	Status of Results/Outcomes
Wood-fuel Strategy - Promotion of Efficient Cooking Stoves	**2008**	**Haiti**	Implemented some recommendations from a previous ESMAP intervention that helped develop a household energy strategy - *"Strategy to Alleviate the Pressure of Fuel Demand on National Wood Fuel Resources.* The activity resulted in the dissemination of 11,000 energy efficient cook stoves. Despite such achievement, the activity has not influenced any subsequent World Bank energy lending in Haiti. One main reason is that higher priority was given to the power sector. For instance, two World Bank electricity access projects have been approved after the ESMAP cook stoves project but they did not include activities to disseminate improved cook

			stoves.
Review of Strategies for Sustainable Production of Commercial Fuel Wood	**2009**	**Africa/Latin America**	Compiled best practices from two forest management approaches The final report has not yet been issued, so it is too early to determine impacts.
SME - Off-grid rural electrification SME program	**2007**	**Bolivia**	Was carried out as part of the ESMAP-funded energy SME activity in Bolivia to support private enterprise. Information on impacts was not available.
Identification and Testing of Inputs for Enhanced Electricity Access Package	**2006**	**Africa**	The activity aims to promote productive uses of electricity and was carried out in collaboration with GTZ, who provided their own funding for their team members. An interim report was published but not formally disseminated because GTZ, the study partner, wanted to include a rigorous statistical analysis of the preliminary survey data, which has not yet materialized. However, the activity is informing the design of the FY12 Nigeria Rural Access and Renewable Energy project (World Bank financing: US$ 200 million), which is under preparation. The project plans to include a component on productive uses of electricity and the TTL of the ESMAP-funded activity is assisting to design the productive use component.
Development of a Decision Toolkit for PV Community Service Applications	**2009**	**Africa**	Developed a decision tool to aid the more effective design and implementation of off-grid projects /programs in health, education and water sectors. The toolkit was recently finalized but is not yet disseminated. Too early to identify or measure impacts.
Gender and Energy GAP	**2008**	**Cambodia**	Complemented Cambodia's energy SME activity. It conducted gender assessments in four pilot projects (improved cook stoves manufacturing and commercialization, bio-digester development, LED lanterns dissemination) under ESMAP energy SME activity to ensure that the projects take into account women's economic empowerment. The activity report was issued and disseminated at a workshop in Cambodia. The gender assessment found that the improved cook stoves, bio-digesters, and LED lanterns that were being

			commercialized, improve the lives of families and, in particular women. Impacts have not been demonstrated.
Benchmarking analysis of electricity distribution center	**2007**	**Latin America**	Provides a comparative analysis of electricity utilities against a set of performance indicators. The activity's final report was produced. Impacts have not been demonstrated.
Identifying traditional and non-traditional mechanisms for reaching the poor in infrastructure services	**2007**	**Latin America**	Seeks to determine pro-poor energy policies based on an analysis of traditional and non-traditional mechanisms for providing access to affordable infrastructure services to the poor. Impacts have not been demonstrated.
Joint Info-Dev /ESMAP SME Assessment	**2008**	**Nicaragua**	ESMAP funded the first phase of the activity, which assessed the opportunities for developing and strengthening SMEs focusing on renewable energy services in Nicaragua. The first phase of the activity concluded that it was premature to establish a renewable-energy focused business incubator in Nicaragua. The activity was ended without carrying out the second phase. Therefore, there are no notable impacts.

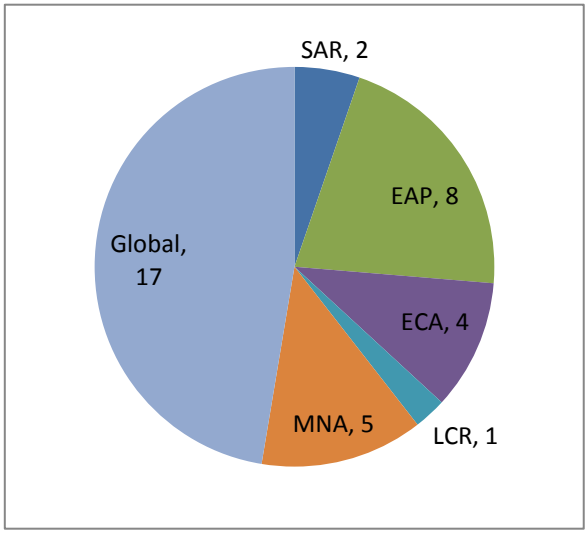
5.3 ESMAP's Portfolio of Energy Efficiency Activities

5.3.1 Overview of the Energy Efficiency Portfolio (FY2009-2011)

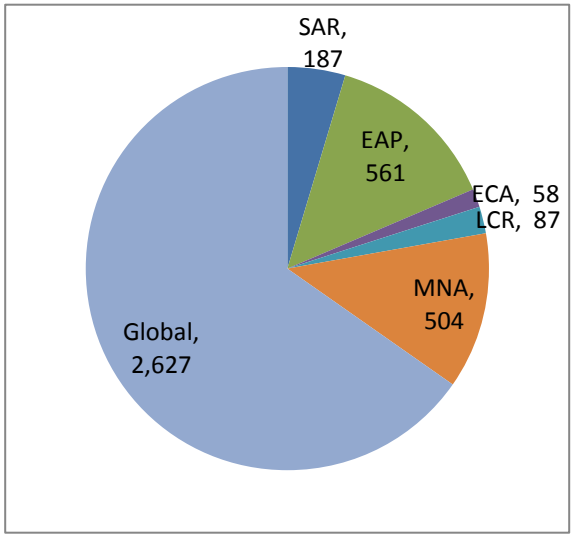
The FY2009-2011 Energy Efficiency portfolio includes 37 activities with disbursement totaling about $4 million. Out of these, 17 activities were implemented as ESMAP own-managed or global activities (Figure 3a), mostly through ESMAP's Energy Efficiency Cities Initiative (EECI). Global activities also account for two thirds of the total disbursement (Figure 3b) with about $2.6 million. The remaining EE activities were implemented by five regions of the Bank, supported by ESMAP's Annual Block Grants (ABGs). The largest number of EE activities was implemented by the East Asia and Pacific (EAP) region followed by Middle East and North Africa (MNA), Europe and Central Asia (ECA), South Asia (SAR) and Latin America and the Caribbean (LCR) regions. There were no EE activities implemented in the Africa region (AFR) during FY 2009-2011.

Figure 7: ESMAP Energy Efficiency Activities by Region

a) By Number of Activities



b) By Disbursement of Activities ($ 000's)



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

The breakdown of the EE portfolio according to the nature of activities and type of output is shown in Table 18 below.

Table 18: EE Portfolio Breakdown by Product Lines, Output Type and Region

Product Line and Output Type /Region	AFR	EAP	ECA	LCR	MNA	GLB	SAR	Grand Total
Energy Sector Work								
Policy Note					1			1
Report			2		1	1		4
Knowledge Product								
Operational Guide		2				2		4
Study		2				2		4
Partnership						3		3
Technical Assistance (Non-lending)								
"How-To" Guidance		2	1	1	2	7	1	14
Institutional Development Plan		1	1		1	2		5
Client Document Review		1					1	2
Grand Total	**0**	**8**	**4**	**1**	**5**	**17**	**2**	**37**

Out of the 37 activities under the EE portfolio, 23 activities were completed and delivered to clients and 14 are still ongoing, with delivery to client expected either in FY 2011 or FY 2012.

5.3.2 Assessment of Outcomes and Results

This section discusses results achieved for the 23 completed activities measured under four outcomes: (i) influencing World Bank lending and strategies, (ii) informing government policy, (iii) building and enhancing client capacity, and (iv) introducing cutting-edge solutions. Of the 23 completed activities, direct results and outcomes were observed and tracked for 19. Of the 14 ongoing activities, early results and impacts have been observed for five activities and are reported to the extent possible. Five EE activities had no observable impacts or measurable results.

5.3.2.1 Influence World Bank Lending

Since ESMAP focuses its efforts “upstream”, a key measure of success is the extent to which ESMAP is able to influence and improve the quality of the Bank’s strategies and lending in the energy sector. Through its ABGs to the Bank’s regions and its EECI, ESMAP EE activities have, both directly and indirectly, influenced EE lending of the World Bank Group (WBG)[8]. ESMAP has played a role in

[8] WBG energy lending includes contributions from sources of IBRD, IDA, Carbon Finance, GEF, IFC, IFC-Carbon Finance, IFC-GEF, MIGA, Recipient-executed and Special Financing.

increasing WBG's EE lending from $1.19 billion in FY 2008 to $1.77 billion in FY 2010, although many of the ESMAP activities during this period are expected to have a greater impact on WBG lending in the next few years. In terms of influencing the Bank's sector-level strategies, only one activity influenced the Bank's sector strategies.

In total, ESMAP EE activities active during FY 2009-2011 have influenced WBG EE lending of about $1.83 billion[9]. The influence was channeled through two mechanisms: (i) through ABG allocations, ESMAP-funded activities have informed, supported, and complemented 16 World Bank Group operations, leveraging WBG EE financing of about $1.3 billion; and (ii) through technical support provided by EECI, ESMAP has directly helped design and develop EE components for the Bank's urban lending projects, leveraging the Bank's urban EE financing of $0.51 billion.

5.3.2.1.1 EE Activities Implemented through ABGs

ESMAP's EE activities implemented by the Bank's regions have been effective in influencing lending to China, Moldova, Pakistan, Tunisia and Vietnam. The influence of these ESMAP EE activities on Bank lending is listed in Table 19 below.

Table 19: List of World Bank Group Lending Projects Influenced by Energy Efficiency Activities Implemented through ABGs during FY09-11

Country	Name of ESMAP Activity	WBG Lending Project (FY, $) and ESMAP's Role
China	***Energy Efficiency Financing***	***Energy Efficiency Financing I (FY2008, $200 M EE component)*** ***GEF - Energy Efficiency Financing I (FY2008, GEF $13.5 M EE component)*** ***Energy Efficiency Financing II (FY2010, $100 M EE component)*** ***Energy Efficiency Financing III (in pipeline FY2011, $100 M EE component)*** The ESMAP Operational Guide, EE Financing, investigated the EE potential of China's most energy-intensive sectors and successfully informed Bank EE lending. The ESMAP-supported TA helped develop a market for investments in medium and large-sized industrial energy conservation projects, often referred to as a "goldmine" of energy savings by Chinese energy conservation experts. Together with an earlier ESMAP study on developing financial intermediation mechanisms[10], this TA provided the basis for two WB financial intermediary loans totaling $313.5 million (i.e., Global Environment Facility and WB China Energy Efficiency Financing Project Phase I &II). Additional

[9] FY 2011 and post-FY 2011 lending numbers are for projects in the pipeline.

[10] The ESMAP flagship activity initiated in FY2002 was entitled "Developing Financial Intermediation Mechanisms for Energy Efficiency Projects in Brazil, China and India".

		WB financing of $100 million for the project – China Energy Efficiency Financing Project Phase III – is now under preparation. Since project effectiveness in October 2008, Phase I of the China Energy Efficiency Financing Project (CHEEF) has been under implementation. By October 2010, one of the two participating domestic banks has leveraged $233 million ($120 million from its own funds and $113 million from industrial enterprises). The investments made are expected to save energy of one million tons of coal equivalent (tce) and reduce CO_2 emissions by 2.6 million tons per year. In addition, CHEEF has played a catalytic role in leveraging additional financing (75 million Euro) for EE from KfW. In parallel, the Global Environment Facility (GEF) grant under CHEEF - is assisting the government in developing and piloting Energy Saving Certificate Trading schemes in Beijing and Shanghai, and developing the detailed design for a dedicated Industry EE Investment Fund. **Related WBG lending prior to ESMAP activity:** Before the ESMAP study, the Bank's EE lending portfolio in China was focused on supporting small-scale energy conservation projects; no EE projects identified.
China	***Survey and Knowledge Sharing on Energy Conservation in China's Provinces***	***GEF - Provincial Energy Efficiency Scale-up Program (in pipeline FY2011, $13.4 M EE component),)*** ***Shangdong Province Energy Efficiency (in pipeline FY2011, $150 M EE component,)*** ***Shanxi Province Energy Efficiency (in pipeline FY2013, $300 M EE component)*** The ESMAP study, *Survey and Knowledge Sharing on Energy Conservation in China's Provinces,* surveyed China's provincial EE programs and summarized lessons learned for provinces to improve design and implementation of future programs. Following up on the study, additional resources from the Australian Agency for International Development (AusAID) and World Bank were mobilized for an in-depth study on accelerating energy conservation in provinces. Together, these efforts planted the seed for a new support platform for provincial-level energy conservation programs, including: (i) a proposed GEF grant of $13 million, the Provincial Energy Efficiency Scale Up Project, to support new innovations and capacity building in Shanxi, Shandong and Jiangxi Provinces, (ii) a proposed Shandong Province Energy Efficiency Bank loan of $150 million, and (iii) a proposed Shanxi Province Energy Efficiency Bank loan of $300 million. **Related WBG lending prior to ESMAP activity:** No EE lending activities identified

China	***Municipal Heat Regulation Phase I and Pre-investment Study***	**Liaoning Third Medium Cities Infrastructure Project (LMC III) (2008, $191 M WB loan)** **Yingkou Economic Development Zone Carbon Finance Project (2010, $7.9 M - Carbon Funds)** **Dashiqiao Central Heating Supply Carbon Finance Project (2011, $5.26 – Carbon Funds)** **Urumqi District Heating Project (proposed for 2011, $100 M WB loan *EE component*)** The ESMAP knowledge product *Municipal Heat Regulation Phase I and Pre-investment Study* helped assess the feasibility of a Bank loan of $191 million, the Liaoning Third Medium Cities Infrastructure Project (LMC III), to improve EE of central heating systems. Subsequently, carbon funds of $13.16 million ($7.9 million for Yingkou Economic Development Zone Carbon Finance project and $5.26 million for Dashiqiao Central Heating Supply Carbon Finance Project) were tapped by selling carbon emission reduction credits generated from more energy-efficient heating services under LMC III. The knowledge product also informed a proposed Bank loan of $100 million, the Urumqi District Heating Project, to help modernize heating systems in Urumqi Municipality. Since project effectiveness in November 2008, LMC III has made satisfactory progress. By end of October 2010, connected heating areas totaling 15.3 million m^2 or 53 % of the targeted areas have been supplied. **Related WBG lending prior to ESMAP activity:** No EE lending activities identified

Moldova	***Moldova District Heating and Electricity Restructuring***	***Additional Financing for Energy II Project (FY2009, $10 M IDA financing)*** The ESMAP ESW, *Moldova District Heating and Electricity Restructuring,* has facilitated the change in heating tariff to cost recovery level, which helped the Government mobilize donor resources. Following the ESMAP support, IDA financing of $10 million[11] was mobilized in FY2009 to improve the heating supply for public institutions including hospitals and schools, under the Additional Financing for Energy II Project. Since project effectiveness in September 2009, the Additional Financing for Energy II Project has proceeded well. The heating systems under the project are in operation, providing heating and cold and hot water for the 2010/2011 winter season. **Related WBG lending prior to ESMAP activity:** During the FY 2006-2008 period, WBG EE lending for Moldova was $2.97 million. Since FY 2009, ESMAP has been providing assistance to the Government in reforming the district heating (DH) sector. During the same period (FY 2009-2010), WBG EE lending for Moldova increased to $20.15 million.
Pakistan	***Support for the Development of a Large-Scale EE Lighting Program***	***Electricity Distribution and Transmission Improvement Program (FY2008, $256.7 M EE component)*** 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 plan will be implemented through the EE component ($15 million) of the Bank-financed Electricity Distribution and Transmission Improvement Program ($256.7 million), which is the only Bank EE lending operation during the FY 2003-2010 period in Pakistan. **Related WBG lending prior to ESMAP activity:** No EE lending activity identified.

[11] A $1 million grant from the Swedish Development Agency (Sida) was also part of the financing of the project.

Tunisia	***Review of Energy Management Policy***	**Tunisia Energy Efficiency Project (FY2009, $55 M *EE component*)** The ESMAP activity identified financing mechanisms to scale up EE and renewable energy in Tunisia, including lines of credit, equity funds, and guarantee mechanisms. It led to the preparation of the $55 million Tunisia Energy Efficiency Project Bank loan, the first EE loan in Tunisia in over 15 years. The loan provides a line of credit through Tunisian financial institutions to industrial EE and cogeneration projects. **Related WBG lending prior to ESMAP activity:** Prior to the ESMAP activity initiated in 2007, there was only one GEF grant of $8.5 million to support industrial EE development.
Vietnam	***TA for GEF Demand Side Management (DSM) and Energy Efficiency (EE) Project***	***GEF - Clean Production and Energy Efficiency (in pipeline, FY2011, $2.4 M EE component)*** ***Vietnam Energy Efficiency (in pipeline, FY2012, $50 M EE component)*** The ESMAP *TA for GEF Demand Side Management (DSM) and Energy Efficiency (EE) Project* supports the implementation of the ongoing GEF Demand Side Management (DSM) and Energy Efficiency (EE) Project in providing capacity building to the Government in implementing pilot EE programs and promoting knowledge exchange for Vietnamese Energy Service Companies (ESCOs). By assessing business opportunities for expanding commercial EE businesses, it also helped provide the basis for (i) the proposed FY 2011 GEF grant of $2.4 million for Vietnam Clean Production and EE, and (ii) the proposed FY 2013 Bank EE project of $50 million. **Related WBG lending prior to ESMAP activity:** In the three years (FY2006-2008) prior to the ESMAP activity in Vietnam, WBG EE lending for the country was $9.8 million. In the following two years (2009-2010), WBG EE lending in Vietnam has increased to $36 million.

5.3.2.1.2 EE Interventions Designed by the Energy Efficient Cities Initiative (EECI)

Since its launch in October 2008, ESMAP's EECI has promoted lending for EE in the urban sector in a number of countries. Under its ***EE Cities Project Support Facility***, EECI has provided technical support in the design, preparation, and supervision of urban EE components in the Bank's investment operations. To date, EECI has supported municipal EE components for seven Bank lending projects[12], in Armenia, China, Macedonia, Mexico, Ukraine and West Bank, which leveraged over $150 million of WB financing for EE improvement in municipalities:

[12] Two of the lending projects - one in Armenia and one in Ukraine - are not yet approved.

- ***Armenia*** | EECI assisted Bank's ECA energy unit in preparing a public sector EE retrofit program targeting municipal social buildings. The program will be one key component of the proposed ***Electricity Supply Reliability and Energy Efficiency Project*** (in pipeline for FY2011, $13.8 M EE component).

- ***Ningbo, China*** | EECI assisted in the design and preparation of the ***Ningbo New Countryside Development Project*** (FY2010, $0.6 M EE component), a program that includes implementing an energy-efficient pilot in a rural township and strengthening the city's implementation capacities.

- ***Tianjin, China*** | EECI helped design and advise on the green buildings component of the GEF ***Tianjin Eco-City Project*** (FY2011, $28.5 M EE component).

- ***Macedonia*** | EECI has contributed to leveraging GEF funding to improve energy use in municipal buildings, primary schools and kindergartens, by supporting the restructuring and subsequent supervision of the EE activities under the ***Sustainable Energy Project*** (restructured in 2010, $3.2 M EE component).

- ***Mexico*** | EECI helped develop an equipment supply and distribution contract to provide efficient light bulbs to urban residential households, under the ***Efficient Lighting and Appliances Project*** (FY2011, $70 M EE component) jointly financed by the Clean Technology Fund (CTF), GEF and WB.

- ***Ukraine*** | EECI supported the design and preparation of the municipal EE component of the ***Ukraine Energy Efficiency Project*** (in pipeline for FY2011, $50 M EE component); EECI also provided technical assistance to carry out a municipal EE market study covering two cities.

- ***West Bank*** | EECI helped develop a municipal EE retrofit pilot in West Bank, under the ***Municipal Development Program Phase I*** (FY2010, $0.7 M EE component).

Two other project development support activities are on course in China and Russia, expected to leverage together $345 million of WB financing for EE improvement in municipalities:

- ***Beijing, China*** | EECI is helping a Bank team utilize Eco-city concept and low-carbon approach to develop and finance several pilot green field sites in Beijing under the ***Beijing Energy Efficiency & Emission Reduction Demonstration Project*** (in pipeline for FY2012, $120 M EE component).

- ***Russia*** | EECI is working with a Bank team on the proposed Bank financial intermediary loan, ***WB/GEF Energy Efficiency (in pipeline for FY2012, $225 M EE component)*** to increase EE investments and a proposed GEF grant to address institutional, regulatory and market barriers facing commercial financing of EE projects. The loan includes EE financing to 15-20 cities.

5.3.2.2 Influence Bank Energy Strategies

No EE activity has directly influenced World Bank energy strategies. However, there is evidence that one activity in the ESMAP EE portfolio, the ***Transport and Climate Change Project*** has provided input to the flagship report of the Bank's Transport Sector, which 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.

5.3.2.3 Inform Government Policy

ESMAP EE activities implemented during FY 2009-2011 have directly recommended, shaped and led to EE policy formulations in China, Moldova, Mongolia, Tunisia and Yemen. These efforts have ranged from reviewing national heat regulations, to supporting a national EE strategy, to helping revise heating tariff methodologies. The impact of ESMAP activities on government policy formulation is described in Table 20.

Table 20: Policies / Programs of Client Countries Influenced by EE Activities

Country	Name of ESMAP Activity	Type and description of policy, legislation, or regulation influenced by ESMAP activity
China	***Heat Regulation Phase II***	**Regulatory framework for district heating** This *ongoing* activity is helping the Ministry of Housing and Urban-Rural Development (MOHURD) prepare a draft of a national Heat Regulation. The TA advised the Ministry on an enhanced institutional model for regulating the DH sector, and is providing advisory support on special regulatory topics identified by MOHURD.
Moldova	***District Heating Restructuring***	**Regulatory framework for district heating** The ESMAP activity led to a Policy Note outlining actions to reform the DH sector to financial sustainability. Based on the recommendations, the regulatory framework and tariff methodology was revised to stop the debt accumulation in the DH sector. A second-phase ESMAP support started in FY 2011, *Chisinau Energy Supply Improvement*, 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.

Tunisia	***Review of Energy Management Policy***	**Energy management policy** The ESMAP activity has helped shape Tunisia's energy policies on pricing, and scaling up EE and renewable energy. The study led to the formulation of an action plan to give a new impetus to Tunisia's energy management policy. Following the study, a new law has been adopted which broadens the EE programs and financing instruments; investment subsidies were broadened to include cogeneration; and, third party access to the electricity grid and buy-back of excess power were made mandatory to encourage cogeneration.
Yemen	***Institutional Framework for Energy Efficiency Program Implementation***	**EE Institutional Framework** The ESMAP activity developed a three-year DSM/EE action plan, which helped the government to lay the foundation for a sustainable program and build implementation capacity. Based on the findings, the Government developed and approved an EE strategy in June 2009, which set out the specific EE target and the broad strategy to achieve it. Currently the Government is seeking assistance from donors (including GEF) to implement this strategy.

5.3.2.4 Build and /or Enhance Client Capacity

ESMAP EE activities have also enhanced client capacity in implementing EE programs through various means including short policy notes, TA, reports, case studies, and knowledge exchange, implemented both by the Bank's regions (ABGs) and own-managed (global) activities. Impacts of ESMAP EE activities on client capacity are described in Table 21 and 22 below.

Table 21: Capacity Building in Client Countries Facilitated by EE Activities through ABGs

Country / Region	Name of ESMAP Activity	Area and description of role of ESMAP activity in Building and / or Enhancing Client Capacity
Afghanistan	***Study on Energy Savings Opportunities in Large Buildings***	**Energy Savings for large buildings / energy audit instruments** The ESMAP activity produced a report to identify 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.
Chile	***Support for Development of National Energy Efficiency Program***	**Implementation of EE programs for municipal institutions** In response to the Chilean Government's request for assistance, ESMAP provided this TA to help implement the comprehensive nationwide EE program– Programa País Eficiencia Energética (PPEE) launched in 2005. Specific training material was developed and an interactive website for e-learning was built (and remains operational). Eleven municipalities took the training in EE through the e-learning platform. The TA built capacity of both national and municipal institutions in implementing EE programs.
Mongolia	***Mongolia Urban Heat Pricing and Regulation***	**Regulatory framework for heating sector** The ESMAP TA, defined options for a new DH tariff methodology for Mongolia. The recommendations provided a framework that could eventually set a path to the financial sustainability of the heating sector enterprises, through consumption-based billing and incentives for efficient heat supply and consumption. A report was produced to summarize training and discussions held mainly with the Energy Regulatory Authority (ERA) and other stakeholders in two stakeholder workshops in Ulaanbaatar in 2006-2007.
Vietnam	***GEF Demand Side Management (DSM) and Energy Efficiency (EE) Project (funded by ESMAP and ASTAE)***	**Capacity building for improving energy efficiency** In 2006, Vietnam initiated its first-ever comprehensive National Energy Efficiency Program (VNEEP), focusing on capacity building during 2006-2010. A further rollout of wide-range activities has been planned for a second, 2011-2015 phase. At the request of the Government, the activity provided an overview of the sector and specific options for further improving EE. It has helped the Government to target the priority areas for the VNEEP and enhance ongoing implementations.

Table 22: Capacity Building in Client Countries Facilitated by EE Activities through EECI

Country / Region	Name of ESMAP Activity	Area and description of role of ESMAP activity in Building and / or Enhancing Client Capacity
Global	***Mainstreaming Building Energy Efficiency Codes in Developing Countries***	**Building EE codes compliance** EECI completed its analytical work on building EE codes compliance and published a book entitled in August 2010. The work is demonstrating early impacts of informing Bank lending and building client capacity.

		The recent GEF Tianjin Eco-city Project has incorporated lessons learned from this work in its project design document. The book was also used by the team of the proposed Poland Energy Efficiency Development Policy Loan Project, which will include a component on building EE codes. The Poland Project team requested specific information and the book for their engagement with the client. In September 2010, the findings from the work were presented in the Building Energy Codes and Labeling Workshop under the auspicious of Energy Working Group of Asia Pacific Economic Corporation (APEC) in Bangkok. About 50 people participated in the workshop, including representatives of government agencies responsible for development and implementation of building energy codes from Vietnam, Indonesia, the Philippines, Thailand, China, and Mexico. Further in January 2011, EECI staff was invited as expert advisor to the second APEC workshop on Building Energy Codes and Labeling in Hong Kong, where future steps in developing and implementing building EE codes and labeling programs in the aforementioned countries were peer reviewed and discussed. Currently, EECI is collaborating with WB regions, IFC and the International Energy Agency (IEA) on mainstreaming building EE codes.
Global	***Technical Support (Small Grants) for Quezon City (Philippines) and Zarqa Municipality (Jordan)***	**Direct technical support (Small Grants) to city clients** 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[13]. The first technical support was completed in Quezon City, the Philippines in 2010, which has enabled city officials to develop an energy efficient buildings program and prepare a green buildings ordinance. The program has since been incorporated in the city's three-year budget. The second activity - assisting Zarqa Municipality in Jordan to develop an energy efficient mobility plan for the city's downtown area – is under implementation.
Global	***EECI Good Practice Database***	**Development of a database with good practice EE case studies from cities around the world** EECI has established a Good Practice Database, with 15 case studies of urban EE now available. The database provides detailed documentation on successfully-implemented

[13] 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.

		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. At present, the database includes cases from China, Colombia, Egypt, India, Mexico, Pakistan, South Africa, Ukraine, USA, plus case studies of Eco^2 Cities[14] from Australia, Brazil, Japan, New Zealand, Singapore and Sweden. These cases span across six urban sectors, namely transport, buildings, water and waste water, public lighting, solid waste, and power and heat. 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[15]. Feedback to date has been quite positive, since the cases provide sufficient details on a range of policy and program options along with implementation details and an objective assessment of results. Currently, EECI is expanding the Good Practice Database and inviting cities to compete for a Good Practice Award in recognition of cities' endeavors in promoting EE.

5.3.2.5 Introduce Cutting-edge Solutions

ESMAP's work under EECI has also offered some innovative approaches for helping city clients use energy more efficiently. Table 23 provides further details on cutting-edge solutions delivered by Energy Efficiency Activities through EECI.

Table 23: Cutting-edge Solutions Delivered by Energy Efficiency Activities through EECI

Country / Region	Name of ESMAP Activity	Area and description of role of ESMAP activity in Introducing Cutting-edge Solutions to Clients
Global	***Tool for Rapid Assessment of City Energy***[16]	**Use of energy diagnostic tool for assessment of energy efficiency performance in cities of client countries** 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

[14] Eco^2 Cities (ecological cities as economic cities) is a Bank initiative.

[15] The webpage of the Good Practice Database received about 500 views since the new ESMAP website went live in mid August 2010.

[16] Section 5.3 describes the tool and its emerging impacts in detail.

		their EE performance, determine underperforming sectors and identify measures to be taken. The tool was successfully pilot tested in Quezon City, the Philippines in March 2010. In FY 2011, the tool is being deployed by the EAP Region and EECI team to help three municipal governments formulate sustainable urban energy development strategies. In parallel, the tool will be piloted in the city of Gaziantep, Turkey in March 2011 and is expected to lead to a tangible investment financing program for the Bank.
Global	***Public Procurement of EE Services***	**Capacity building on institutional, regulatory, financial and technical barriers to procuring EE services in the public sector** EECI published a book in 2010 to present the results of a study on public procurement of EE services. The book *Public Procurement of Energy Efficiency Services* offers specific solutions to address institutional, regulatory, financial and technical barriers to procuring EE services in the public sector. By making incremental adjustments in budgeting and procurement procedures, and actively promoting the EE service industry through bundled tenders and financing programs for retrofit projects, this work shows how energy waste in the public sector can be significantly reduced. In particular, it demonstrates that use of energy savings performance contracts (ESPCs) allows public agencies to outsource EE projects from development to financing to monitoring, and yield gains with less hassle and risk. Leveraging this analytical work, EECI has helped a Bank project in Armenia design the country's (and the Bank's) first ESPC for EE retrofitting in the municipal sector. The Armenia project is expected to generate immense monetary savings, about 30-50 percent savings of energy bills per facility, and better energy security, since about 97 percent of Armenia's energy is imported. Currently, EECI is disseminating the work in a number of client countries – such as China and Russia - to help local governments adopt and adapt these approaches to realize these important benefits.
Global	***EECI Support to Eco^2 Cities***	Eco^2 Cities is a Bank initiative designed to plan, develop, build and manage cities that are simultaneously more ecologically and economically sustainable. EECI wrote the Energy and Cities chapter for its main publication *Eco^2 Cities: Ecological Cities as Economic Cities*, which provided the roadmap for the operationalization of the initiative[17]. The initiative is breaking new ground within the Bank, marking a clear divergence from typical silo-based urban development. The team, which included two EECI members, won the Bank's Sustainable Development Network Vice President Unit Award

[17] The chapter written by EECI for the Eco^2 publication is one of the outputs under the EECI umbrella activity "Energy Efficient Cities Practitioners Workshop".

		(SDN VPU Award) in December 2009 in recognition of their exceptional achievement. EECI has applied the Eco^2 City approach in helping design the GEF Tianjin Eco-City Project, and is utilizing the concept to help develop greenfield pilots in Beijing.
Global	***Operational Toolkit for EE Lighting***	ESMAP developed the operational toolkit for EE lighting, 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 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 as numerous Bank projects processed in FY 2010-2011 (such as the Mexico EE Lighting and Appliances project, the Bangladesh RERED projects, Mali Energy project, etc.) were able to use the Toolkit. The CFL Toolkit was also being used by IFC for the India project and 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.

5.3.3 Specific Cases of Policy and Operational Impact

The following section provides specific cases of impacts achieved by selected EE activities. These activities have generated some of the most noteworthy accomplishments within the portfolio.

5.3.3.1 China Heating Sector Reform

Over the past several years, ESMAP studies have developed a platform to support policy reforms in the heating sector in China and helped identify downstream investment opportunities.

Early in 2003 ESMAP forged a partnership with the Ministry of Construction (MoC, later renamed the Ministry of Housing and Urban-Rural Development, or MOHURD) and the Tianjin Municipality on the development of a national heat pricing and billing policy. Based on the ESMAP work, MoC revised the "National Heat Pricing Management Method" and Tianjin Municipality adopted the recommended pricing approach, representing the first application of a consumption-based, two-part heat tariff regime in China.

ESMAP continued support to the policy reforms through the study, *Heat Reform and Regulations: Issues and options in Heat Regulation (Phase 1) and Pre-Investment Support*. Together with the GEF Heat Reform and Building Energy Efficiency Project, it led to national interim guidelines on two-part heat tariffs, consumption-based billing pilots in four cities, and adoption of stricter building EE codes. Major Bank lending projects in the sector have benefitted from the study including the Liaoning Third Medium Cities Infrastructure Project (LMC III) and two related carbon finance projects, as detailed in Section 4.1.

The latest ESMAP TA, *Heat Regulation Phase II,* 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 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 team is expected to provide comments on the Policy Paper prepared by MOHURD consultants for drafting the Regulation.

5.3.3.2 Moldova District Heating Restructuring

The DH system in the capital city of Chisinau plays an essential role in the Moldovan energy sector, supplying heat to about 15% of the country's population. However, due to years of tariff setting below cost-recovery level and inadequate investments, the DH utility in Chisinau was financially insolvent and delivered poor quality services. In this context, the central government, the municipality of Chisinau, and the DH utility in Chisinau requested assistance on initiating and facilitating the dialogue amongst stakeholders to restructure the DH system.

The ESMAP activity, *Moldova District Heating and Electricity Restructuring*, completed a Policy Note in addressing the issues in two phases, firstly to stop accumulation of new payables and secondly to resolve the accumulated debt. A workshop held to disseminate the findings has helped policy makers (the municipal government and the central government) and other key stakeholders (the DH utility and creditors) reach a general consensus on the actions to be taken. Subsequently, the Government has adopted some of the policy recommendations from the ESMAP report to stop further accumulation of debt in the DH utility: 1) the Government issued a law on December 2009 to transfer full district heating tariff setting authority to the independent energy regulator National Agency for Energy Regulation (ANRE) and 2) in January 2010, ANRE increased the heating tariffs for the 2009/2010 heating season by 30%. It is estimated that the current tariff now covers all operating costs.

In FY 2011, ESMAP continues support to help the Government address the accumulated debt in the DH sector, through a TA, *Chisinau Energy Supply Improvement*. The Bank team is currently working on policy options on debt and corporate restructuring to resolve the outstanding financial issues and improve operational efficiency of the system. At the same time, the team is coordinating the efforts with donors including Sida, the United States Agency for International Development (USAID) and the European Commission (EC), on required TA and financial investments to reform the sector to become financially sustainable.

5.3.3.3 Tool for Rapid Assessment of City Energy

Cities are an important engine for economic growth and socioeconomic development. Rapid urbanization and strained infrastructure will lead to massive requirements for new energy sources and environmental challenges, a concern for most city authorities. To help cities address this growing concern, ESMAP's EECI program has designed and is deploying a tool which allows cities to rapidly diagnose their energy use.

The Tool for Rapid Assessment of City Energy (TRACE, previously named Rapid Assessment Framework) is an innovative decision support tool for quickly evaluating EE opportunities in cities. TRACE examines energy efficiency in six sectors: transport, buildings, water, public lighting, solid waste, and power/heating. It consists of two principal components: (i) a city energy benchmarking tool and, (ii) a 'playbook' of tried and tested EE 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 EE recommendations tailored to the city's individual context, with implementation and financing options. A Virtual Panel of external experts including several city officials provided review and commentary throughout the development of the tool.

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 is now being utilized by the Bank's EAP region to help three cities in Vietnam, Indonesia and the Philippines assess their energy use and formulate long-term sustainable urban energy development strategies. In parallel, ESMAP will pilot the tool in the city of Gaziantep, Turkey with Bank's MNA region from March to April 2011. 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.

5.3.4 Energy Efficiency Activities with Limited or Unobservable Results

Out of the total 23 activities reviewed, direct results or impacts could not be observed for five of them.

Vietnam	***Vietnam Fuel Efficiency, Trade Facilitation and GHG Reductions Project***	The activity produced a report to recognize the win-win situation from shifting some freight movements from trucks to coastal vessels in Vietnam. There is no impact observed at

		the beneficiary level, though a follow-up study (financed by the Trade Facilitation Facility) is expected to lead to substantial policy recommendations and change.
Global	***EE in African Water Utilities*** ***Energy M&T Pilot***	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. Following the assistance in Africa, EECI continued promoting energy M&T in WSUs in Vietnam. EECI presented three case studies from Brazil in a workshop in November, 2010 in Vietnam. The workshop was attended by more than 40 WSUs in Vietnam. The Vietnam Water Association was closely involved and a significant number of water utilities have expressed interest in reducing energy costs through energy M&T. Further, 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.
Global	***Country EE Performance Indicators***	An International Roundtable on EE Performance Indicators was organized by ESMAP and attended by 40 participants including EE officials and experts from China, India, Mexico, South Africa, Turkey, and Vietnam, as well as experts and representatives from international organizations (e.g., IEA) and research institutions. The Roundtable reviewed lessons learned, and assessed the need of capacity building on EE metrics and national EE assessment in developing countries. It developed a set of actionable recommendations to Bank management in helping to improve EE indicator development and sharing. No measurable impacts have been identified yet for this activity.
Global	***Support to 5th Urban* Research Symposium - *Cities and Climate Change: Responding to an Urgent Agenda***	EECI participated in the Bank's 5th Urban Research Symposium - *Cities and Climate Change: Responding to an Urgent Agenda* held in Marseille, France in June 2009. The

		symposium aimed at pushing forward the research agenda on climate change from a city's perspective, and was attended by over 650 researchers and practitioners. During the Symposium, ESMAP sponsored two EECI sessions: (i) tools and assessment approaches on energy efficient urban development, and (ii) good practices that promote low-carbon interventions in urban sectors. More than 85 participants from 16 countries attended these two sessions. Together, these sessions provided a platform to both developing and developed country urban experts to present and exchange their work on urban energy issues. However, it is still premature to measure direct results from this ESMAP outreach activity.

5.4 ESMAP's Portfolio of Renewable Energy (RE) Activities

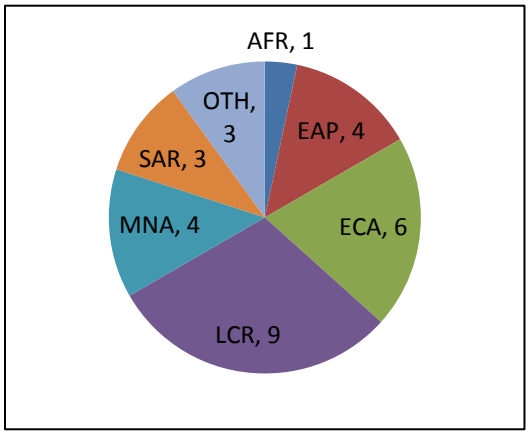
5.4.1 Overview of the Renewable Energy Portfolio (FY2009-FY2011)

In 2009, ESMAP established the Renewable Energy Market Transformation Initiative (REMTI) to help countries address the preparatory work needed in the earlier stages of program development. REMTI provides an organizing framework for collecting and disseminating lessons and findings from a wide range of RE activities undertaken by ESMAP. Typically, the development of the RE sector in a client country evolves progressively through a number of stages: resource assessment; strategy development; policy and institutional capacity building; pilot and demonstration projects; and finally scale-up to widespread deployment. ESMAP's RE support focuses 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 Environmental Facility (GEF), and the Carbon Partnership Facility (CPF).

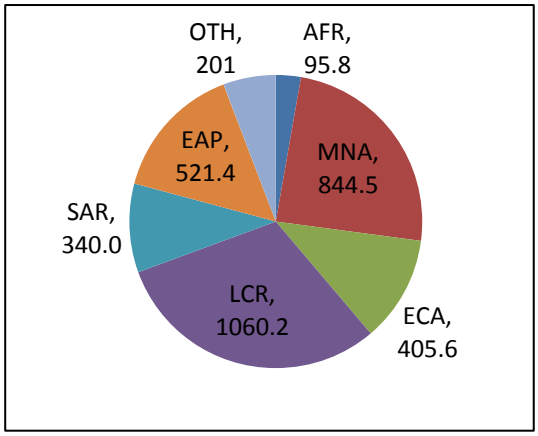
ESMAP's renewable energy portfolio for the period of FY2009 – FY11 comprised 30 activities with disbursement totaling $3.4 million. Of these, 11 activities have been completed and 19 activities are still ongoing (see Annex 1 for complete list of RE ESMAP activities). The majority of the projects during the FY2009-2011 period have been implemented under REMTI. The breakdown of number of RE activities by region and disbursement amount is shown in Figure 4 a and b below.

Figure 8: ESMAP Renewable Energy Activities by Region

a) By Number of Activities



b) By Disbursement ($ M)



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

The breakdown of the total RE portfolio according to the nature of activities and outputs type is shown in Table 24 below (for description of product lines and outputs types please refer to Annex 2)

Table 24: Renewable Energy Portfolio Breakdown by Product Lines, Output Type and Region

Product Line and Output Type /Region	AFR	EAP	ECA	LCR	MNA	GLB	SAR	Grand Total
Energy Sector Work								
Policy Note		1						1
Report	1	1	1	4		2		9
Knowledge Product								
Databases								
Operational Guide				1		1		2
Studies		1			1			2
Partnership		1						1
Technical Assistance Non-Lend								
"How-To" Guidance			3	1	3		1	8
Client Document Review				2				2
Institutional Development Plan								
Knowledge-Sharing Forum				1			1	2
Other (PE, Model)			**2**				**1**	**3**
Grand Total	**1**	**4**	**6**	**9**	**4**	**3**	**3**	**30**

5.4.2 Assessment of Outcomes and Results

This section presents the results and outcomes of ESMAP's renewable energy activities implemented over the period FY2009-2011 in terms of informing and/or influencing Bank lending, enabling better policy making, and enhancing client capacity. No RE activities provided results or outcomes in terms of introducing cutting-edge solutions.

5.4.2.1 Influence World Bank Lending

ESMAP's RE activities have played a role in influencing World Bank Group financing of about $1.0 billion on clean energy. Table 25 below provide further details on ESMAP's RE activities that have influenced Bank lending over FY09 – FY11.

Table 25: List of World Bank Group Lending Projects Influenced by RE Activities during FY2009-2011

Country	Name of ESMAP Activity	WBG Lending Project (FY, $) and ESMAP's Role
Middle East and North Africa region	***North Africa Regional CSP Scale-Up Initiative***	***Morocco - Ouarzazate Concentrated Solar Power (in pipeline, IBRD 200 million USD loan (proposed), CTF 100 million USD*** ***Egypt – Kom Ombo Solar Power* (in pipeline, *IBRD 170 million USD loan (proposed))*** ***Tunisia-STEG Concentrated Solar Power (in pipeline, IBRD 35 million USD loan (proposed), CTF 36 million USD (proposed))*** Although this activity is still ongoing, it 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 the resources for the feasibility and investment phases of CSP projects in Morocco, Egypt and Tunisia which are currently under preparation. **Related WBG lending prior to ESMAP activity:** Before the ESMAP study, there was no Bank lending on CSP in the region.

Egypt	***Commercial Wind Development Framework***	***Egypt Wind Power Development Project (IBRD 70 million USD, CTF 150 million USD), FY2010)*** 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 assisted the GoE in its ongoing dialogue with the Bank, and helped secure the financing from the Clean Technology Fund for wind power development. . **Related WBG lending prior to ESMAP activity:** No lending in support of wind projects.
Mozambique	***Modern Biofuels Assessment***	***Energy Development and Access Project (FY2010, $3.2 M)*** The activity (still ongoing) assessed the feasibility to produce and market biofuels in Mozambique as alternative renewable fuels for transport, industry, power generation, and households. The activity informed the *Energy Development and Access Project*, a World Bank lending project 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. **Related WBG lending prior to ESMAP activity:** No prior loans on biofuels energy.

Mexico	***Mexico Renewable Energy Assistance Program***	***GEF Wind Umbrella Project III (La Venta III) (FY2006, $1.22 M)*** ***Low-Carbon Development Policy Loan for Mexico (FY2011, $401 M)*** 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 particular SENER) 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).* **Related WBG lending prior to ESMAP activity:** No prior loans on wind energy.

5.4.2.2 Inform Government Policy

ESMAP's RE activities have served as a platform to influence government policies and regulations on RE. Bulgaria, China, the Philippines, Peru, Colombia, and Mozambique are examples of where ESMAP has demonstrated such impacts.

Table 26: Policies / Programs Influenced by ESMAP RE Activities

Country	Name of ESMAP Activity	Type and description of policy, legislation, or regulation influenced by ESMAP activity
Bulgaria	***Building Regulatory Capacity for Renewable Energy Sources in Bulgaria***	**Strengthening of regulatory agency & improvement of policy and regulatory framework for renewable energy** 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: (i) 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; (ii) procedures for RE developers to access the transmission system have been clarified and streamlined; (iii) 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; (iv) work has been initiated on the provisions in the RE law on heating and cooling; (v) structural changes to SEWRC are envisaged in the new Energy Act as per the report's recommendations; and (vi) the guidance of the report on the communication strategy is being actively used.
China	***China Energy Intensity Reduction Strategy: Evaluating the Government's Renewable Energy Targets***	**Evaluation and scaling up of renewable energy targets; promotion of trade and developing green electricity schemes.** 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. The ESMAP policy note *Evaluating the Government's Renewable Energy Targets* 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. The recommendations of the policy note regarding priority development of hydropower and improving the performance of wind power have been included in the 12th 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 which, however, has not yet been made public.

Philippines	***Philippines Renewable Energy Development***	**Regulatory and institutional framework for renewable energy** The ESMAP-funded TA to the Philippines (still ongoing) has provided policy support to the Government to develop an implementation framework to implement the RE Law passed in October 2008 to accelerate the development and utilization of renewable energy resources. In parallel, it has helped establish an institutional framework and mechanisms to carry out these mandates. ESMAP support has also included capacity building to 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.
Slovakia	***Establishing Regulatory Framework for Renewable Energy Sources***	**Regulatory framework for RE** 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 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.

Colombia	***Colombia: Market Entry Framework for Wind Energy***	**Policy and regulatory framework for promotion of wind energy** 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 (as of February 2011) 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.
Peru	***Peru: Opportunities and Challenges of Small Hydropower Development*** ***Peru Small Hydro***	**Policy and regulatory framework for improvement of investment climate for RE in Peru** These ESMAP activities were undertaken to support the government of Peru in developing additional indigenous supply of electricity from small to medium scale hydropower. The TAs 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 TAs 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.
Mexico	***Mexico Renewable Energy Assistance Program***	**Policy and regulatory framework for renewable energy** Mexico's Renewable Energy Technical Assistance Program (still ongoing) is helping the Government promote and develop renewable energy and also assisting the Mexican government in the design of policies and regulations needed to implement its Renewable Energy Law. One of the components of the TA is the definition of a Program that leads to the development of guidelines for contracting renewable energy and efficient cogeneration projects.

Mozambique	***Modern Biofuels Assessment***	**Policy and regulatory framework for biofuels** This ESMAP activity was in response to a request from the Government of Mozambique (GoM) to provide a TA to assess the feasibility to produce and market modern biofuels in the country. The activity involved a technical, economic, social, and environmental assessment – including the design of a draft national biofuels program and implementation strategy. The outputs of the study have served as the main input in 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.

5.4.2.3 Build and / Or Enhance Client Capacity

ESMAP has also been helping various countries to improve their capacity to scale up deployment of RE technologies. It has used a variety of avenues—workshops, conferences, publications, and web-based tools and learning—to share knowledge and best practices to develop, plan, and implement policies and strategies to scale up the deployment of renewable energy.

Table 27: Capacity Building in Client Countries Facilitated by Renewable Energy Activities

Country / Region	Name of ESMAP Activity	Area and description of role of ESMAP activity in Building and / or Enhancing Client Capacity
Philippines	***Philippines Renewable Energy Development***	**Capacity building and support to the National Grid Corporation (NGCP) on transmission expansion to integrate renewable energy in the grid** As part of the ESMAP activity, a workshop in Manila ("International Experience on Renewable Energy Development Technical Workshop", April 2010) informed the Philippine RE policymakers and other practitioners of the 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.

Bulgaria	***Building Regulatory Capacity for Renewable Energy Sources in Bulgaria***	**Policy and regulatory framework for renewable energy** 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. 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.
Peru and Bolivia	***Capacity Building in Renewable Energy for Implementing Agencies in Latin America – Peru and Bolivia***	**Strengthening of government capacity to implement RE projects to increase access electricity services in rural areas.** In Bolivia, the technical assistance was mainly delivered to the Vice Ministry of Electricity and Alternative Energies, within the Ministry of Energy and Hydrocarbons. The TA focused on two main activities: (i) a pilot project for Pico PV systems (small systems ranging from 20-50Wp). (ii) small Size PV (50-500Wp): Solar Home Systems (SHS) component of the Decentralized Infrastructure for Rural Transformation (IDTR) Project and upcoming GPOBA project. The results of the Pico Photovoltaic (PV) pilot activity have proved the potential of Pico PV products. As regards the Solar Home Systems activity, the 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. 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.

China	***China Energy Intensity Reduction Strategy***	A capacity building component was included in the ESMAP support program to transfer the method and model used to evaluate RE targets to local institutes that will support the Chinese Government to update the study in the future. This has enhanced the capacity of the government to maximize the benefits of RE development.

5.4.3 Specific Cases of Policy and Operational Impact

5.4.3.1 Mexico: Renewable Energy Assistance Program

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.

The TA is also assisting the GOM (in particular SENER) in the definition of an administration agreement with the Ministry of Finance and the preparation of terms of reference for wind energy activities expected to be supported by the GEF (e.g., the 101 MW La Venta 3 project).

5.4.3.2 North Africa Regional CSP Scale-Up Initiative

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. The current status and the initial results of some of these and other significant CSP-related activities can be summarized as follows:

- A new cross-sectoral study (jointly implemented and financed by the Bank's energy and water units) on desalination opportunities of CSP is underway. This is designated as a flagship study as part of the MENA regional water strategy and has received strong support from client countries. The first consultations are planned with regional clients in late February 2011 to identify countries where pilots could be implemented.
- The study on local manufacturing opportunities has been completed and a report has been posted on the web. Client countries are already integrating results from the study in the design of the proposed projects (Morocco and Egypt) and in their solar plans (Morocco). In addition, follow-up dissemination activities have been requested in Egypt, Morocco, and Tunisia for supporting local manufacturing opportunities. For this purpose, the Bank has engaged the resources of the Information for Development (InfoDev) program among others.

By undertaking these TA 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.

5.4.4 Renewable Energy Activities with Limited or Unobservable Results

As REMTI was established only in FY09, majority of the activities are still in the initial stages of delivery, or have been completed very recently and it is therefore too early to assess most of the medium-term outcomes or impacts. It should also be noted that not all projects have demonstrated direct and/or demonstrable influence in terms of informing country policy, enhancing client capacity or providing cutting edge solutions. In other cases, it is difficult to attribute a shift in the Bank's country/ sector strategy or in client country's policies to a single ESMAP activity. Under the RE portfolio, there were three activities which did not provide specific achievement of outcomes or data on results was unavailable (Table 28):

Table 28: ESMAP RE Activities with Limited or Unobservable Results

ESMAP Activity	Completion Year	Country/Region	Status of Results/Outcomes
Economic Assessment of Palm Oil Production for Biodiesel in Colombia	2008	Colombia	The Government of Colombia's response to the policy recommendations in the report is still awaited, although 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. However, no direct results have been identified. The study is yet to be released to the public
South Eastern Europe Regional Energy Efficiency and Renewables	2009	South Eastern Europe and Balkans	No data on impacts or results were available.
Clean Energy Technology Acceleration	2008	Global	No data on impacts or results were available.

5.5 ESMAP's Low Carbon Portfolio

5.5.1 Overview of the Low Carbon Portfolio (FY2009-FY2011)

The low carbon growth country studies support the development of a long term (2030 or beyond) framework for mitigation activities that supports development and growth and is embedded in national and sectoral plans. These studies help to define development goals and priorities and greenhouse gas (GHG) mitigation opportunities, and examine the benefits and costs of low carbon growth. A number of studies span several greenhouse gas emitting sectors, e.g. energy, transport, land-use and forestry and waste management.

Most studies placed strong emphasis on building national consensus and ownership of the assessment process, analysis and results and subsequent implementation. As a result, they have taken time to complete.

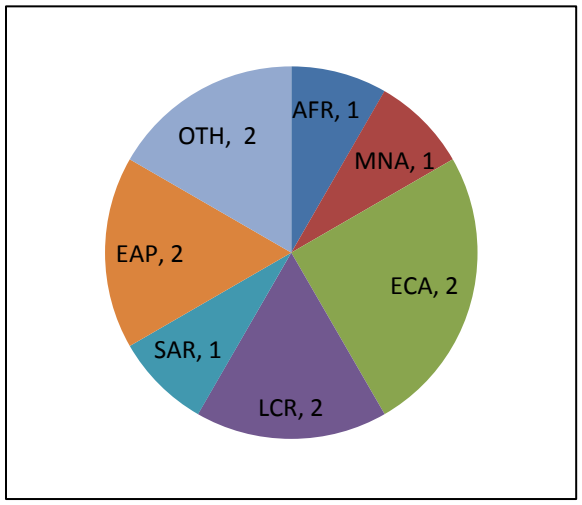
The low carbon growth country studies were initiated in 2007 in 5 countries (Brazil, China, India, Mexico and South Africa) in response to a G8 discussion on the Clean Energy Investment Framework. The program was subsequently expanded to include Indonesia and Poland. The first studies were completed in Mexico and Brazil in 2010; other studies are now drawing to a close. This body of work was funded with support from the UK's DFID through a dedicated multi-donor trust fund. It forms 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.

Also, as climate mitigation and low carbon development have begun to be mainstreamed in the Bank, new activities have been included in ESMAP's low carbon portfolio, supported through block grants to the Bank's regional operational units. These activities include support for low carbon development in the energy/ power sector in Serbia, Morocco and Nigeria; pilot activities and analysis of carbon foot printing in the energy sector, and mitigation activities in Morocco's transport sector.

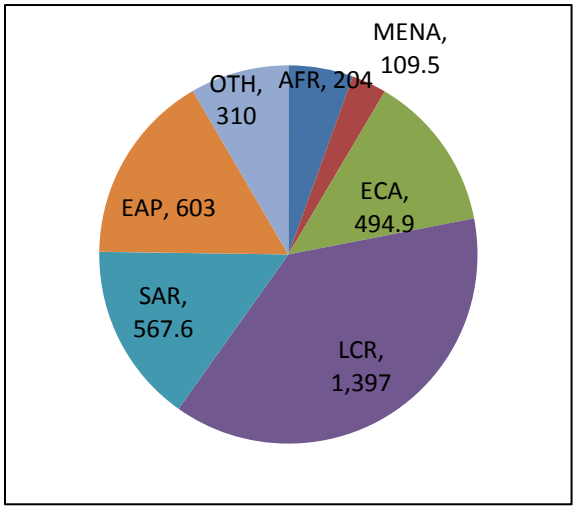
ESMAP's FY2009-2011 low carbon (LC) portfolio comprises 11 activities totaling about US$ 3.7 million. The breakdown of LC activities by region and disbursement amount is shown in Figures 8 a and b. Breakdown according to the nature of actvities and output type is shown in Table 29 below (for description of product lines and output types please refer to Annex 2).

Figure 8: ESMAP's Low Carbon Portfolio by Region

a) By Number of Activities



b) By Disbursement ($ 000's)



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

Table 29: Low Carbon Portfolio Breakdown by Product Lines, Output Type and Region

Product Line and Output Type /Region	AFR	EAP	ECA	LCR	MNA	GLB	SAR	Grand Total
Energy Sector Work								
Policy Note	0	1			1			2
Report	1	0	1	2		1	1	6
Sector Strategy Paper						1		1
Technical Assistance Non-Lend								
"How-To" Guidance								
Client Document Review		1						1
Institutional Development Plan								
Study			1					1
Grand Total	**1**	**2**	**2**	**2**	**1**	**2**	**1**	**11**

Of the 11 activities, 4 have been completed, 5 are closing on March 31, 2011 and 2 are ongoing. Although the analysis covers primarily completed activities, in the case of the low carbon portfolio, some activities scheduled to close in March 2011 are also reviewed as they have already shown some important results.

5.5.2 Assessment of Outcomes and Results

This section presents the results and emerging outcomes of 9 of ESMAP's low carbon activities that are either complete or are due for completion on March 31, 2011 (Annex 1), and that have been implemented over the period FY09-11. The assessment focuses on how these activities influence World

Bank lending, enable better policy making, enhance client capacity and/ or facilitate the adoption of cutting-edge solutions.

5.5.2.1 Influence World Bank Lending and Strategies

ESMAP's analysis of low carbon development options has helped to identify country-level, technically feasible measures to reduce overall GHG emissions that can be implemented in the short and medium term. Most of the studies indicate that near-term low-carbon action is technically feasible at low cost over the next 20-30 years without major changes in technologies.

- In **Brazil**, the study projected gross emissions in the 2030 low carbon scenario that are 20% lower than total emissions in 2008 with measures to reduce deforestation and increase carbon uptake being the most effective (avoiding more than 11.1 G tCO_2e over 2010-30).
- In **India's** power sector, reducing technical transmission and distribution losses is one of the most cost-effective means of improving power sector performance while simultaneously reducing CO_2 emissions.
- In **Mexico**, 80% of the overall GHG reduction potential lies at less than US$10 per tCO_2e. Of these, transport measures account for 27% of the overall mitigation potential. Integrated urban transport and land-use planning will be critical factors in overall energy use and emissions.

The studies also highlight the regulatory, institutional, behavioral and market development barriers that inhibit low-carbon interventions from occurring rapidly or on a large scale despite the identification of high-priority interventions with low or negative net costs in many countries. Large volumes of incremental investment financing and incentives are needed to realize low carbon opportunities and may require international financial support.

Box 1 - Barriers to Low Carbon Technologies

In **Mexico**, expanding renewable energy and energy efficiency in the power sector would require several policy and regulatory changes, including reforming energy prices and increasing the price of petroleum products and natural gas; and changing public procurement rules to facilitate energy efficiency investments in public buildings and municipal services.

In **Brazil** the main barrier for bagasse cogeneration and wind energy is the cost of interconnecting with the sometimes distant or capacity-constrained sub-transmission grid. If this cost continues to be fully borne by the respective sugar mills and wind-farm developers, the contribution of cogeneration and wind energy will likely remain low, resulting in the entry of more fossil fuel–based alternatives. Work is needed to design an ambitious smart-grid development program to help to optimize the exploration of this promising but distributed low-carbon generation potential.

Indonesia's emissions from deforestation and land-use change are currently greater than those from fossil fuel combustion. Most deforestation occurs on production forest land and on land slated for conversion to other uses, mainly agriculture and plantations. Mitigation actions that make economic sense include: law enforcement, management and governance (for REDD), forest and peat fire management, land-use allocation/ licensing, financing incentives.

The exploration of mitigation opportunities and measures to support their implementation has helped inform Bank lending and strategies in a variety of ways, as identified below.

- ***China Energy Intensity Reduction Strategy***: The study 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. As a direct result of the low carbon study, China established a National Energy Conservation Center to strengthen its capacity to implement energy efficiency policies. The study informed about USD 400 million of World Bank lending on energy efficiency as shown in Table 30 below: 1) China Energy Efficiency Financing Project (USD 200 million); 2) China Energy Efficiency Financing II (USD 100 million); and an additional USD 100 million loan under preparation for China Energy Efficiency Financing III. The Global Environment Facility is also providing technical assistance to the National Energy Conservation Center (USD 2.8 million) to ensure that it is operational and fully functional.

Table 30: List of World Bank Group Lending Projects Influenced by the China Energy Intensity Reduction Strategy Project

Lending Operations	Amount and FY
China Energy Efficiency Financing Project	$200 M, 2008
China Energy Efficiency Financing II	$100 M, 2008
China Energy Efficiency Financing III	$100 M, under preparation

- ***Mexico Low Carbon Study***: This was the first study to be completed in 2010. It finds that it will cost Mexico approximately USD 64 billion to 2030 (USD 3 billion per year) to follow a low carbon growth path and identifies specific near term mitigation actions that can be taken by the Government, such as cleaner urban transportation, energy efficiency, and renewable energy, especially wind power. These results have directly informed World Bank lending and strategy (Table 1), contributing to the development of an approved USD 500 million Clean Technology Fund Investment Plan. The study is also contributing to the Bank's country partnership strategy, providing input to sector strategies and investment loans including the Urban Transport Transformation Project (2010) and Efficient Lighting and Appliances Project (2010). It has also informed the development of policy loans (DPL) such as the Climate Change DPL (2008), the Green Growth DPL (2009), and a recent USD 401 million Low Carbon DPL (2010) that supports policy measures for near-term priority actions identified in the low carbon study.

Table 31: List of World Bank Group Lending Projects Influenced by the Mexico Low Carbon Study

WBG Lending Operations	Amount and FY
Mexico Climate Change Development Policy Loan	$501.25 M, 2008
Mexico Framework for Green Growth Development Policy Loan	$ 1503.7 M, 2010
Mexico Low Carbon Development Policy Loan	$ 401 M, 2010
Mexico Urban transport Transformation Project	$ 150 M, 2010
Efficient Lighting and Appliances Project	$ 250.63 M, $ 50 M (CTF), $7.12 M, 2011

- ***Morocco - Transport and Climate Change Project***. 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 in the pipeline include an Urban Transport Development Policy Loan (DPL) (USD 140 million) that supports implementation of institutional, regulatory and financial reforms[18]. 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_2 emissions.

Table 32: List of World Bank Group Lending Projects Influenced by the Morocco Transport and Climate Change Project

WBG Lending Operations	Amount and FY
Urban Transport Development Policy Loan	$140 M, under preparation
Urban Transport Development Policy Loan – Phase II	$100 M, FY2013

- ***Poland Climate Change:*** 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

[18] Board presentation is planned for March 2011.

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. The study has additionally created a solid platform for policy dialogue between the World Bank and the European Commission (EC) on energy and climate change as demonstrated in the December 2010 seminar at the EC. It has further helped increase the Bank's visibility in Poland as demonstrated through successful presentations at numerous events[19]. A USD 1 billion Energy Efficiency DPL is under preparation[20].

Table 33: List of World Bank Group Lending Projects Influenced by the Poland Climate Change Project

WBG Lending Operations	Amount and FY
Poland – Energy Efficiency Development Policy Loan	$ 1,000 M, under preparation

5.5.2.2 Inform Government Policy

Table 34 summarizes how ESMAP's activities have informed government policy-making.

Table 34: Policies / Programs of Client Countries Influenced by ESMAP's Low Carbon Activities

Country /Region	Name of ESMAP Activity	Type and description of policy, legislation, or regulation influenced by ESMAP activity
Brazil Mexico	***Brazil Low Carbon Study*** ***Mexico Low Carbon Study***	**Regulatory framework and overall national strategy on climate change for Brazil and Mexico** 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. Similarly, the results and findings of the Mexico low-carbon study have directly contributed to Mexico's climate

[19] e.g. presentation in the Parliament (June 2010), XX Krynica Economic Forum (September 2010), conference at the Ministry of Economy (October 2010), international conference in Warsaw "Towards a low carbon economy" (December 2010) and Energy Round Table (May 2010-February 2011).

[20] It will be discussed by the Bank's Board at the end of FY11.

		change program (Programa especial de cambio climatico) adopted in August 2009.
India	***Strategies for Low Carbon Growth***	**Reassessment of existing policy to develop renewable energy** The India study offered an opportunity for policy-makers to reassess the validity of sector plans and other proposed actions under the National Action Plan on Climate Change, given the triple constraints India faces (1) availability of reliable and affordable energy sources; (2) availability of financing; and (3) institutional capacity, including availability of adequate human resources - to carry out these ambitious programs. 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. 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.
Poland	***Poland Climate Change***	**Review of Poland's regulatory framework for energy security and environment; and, strengthening and cooperation among energy agencies** Insights from the Poland low carbon study were used as references during the preparation of Poland's medium-term (2020) and long-term (2030) economic strategies, in particular the pillar on: Energy Security and Environment. The study further helped to strengthened inter-governmental cooperation between core agencies in Poland: Ministry of Energy, Ministry of Environment, the EU Emission Trading Scheme administrator, Ministry of Finance, Ministry of Infrastructure, central bank, Energy Regulatory Body, Ministry of Foreign Affairs through 4 working-level seminars organized in the World Bank office and Ministry of Energy premises. It also contributed to a more pragmatic debate on GHG reduction targets and national and EU's energy policies

South Africa	***South Africa Low Carbon Growth***	**Review of the country's Long Term Mitigation Strategy/ energy management** ESMAP provided support to South Africa to review their draft Long Term Mitigation Strategy (LTMS). This 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 its Long-Term Mitigation Scenario (LTMS). ESMAP's TA also served as an input to a USD 500 million Clean Technology Fund Investment Plan spanning clean energy investments.

5.5.2.4 Build and /or Enhance Client Capacity

Table 35 summarizes how ESMAP's low-carbon activities have enhanced client capacity to reduce GHG emissions and ensure sustainable growth.

Table 35: Capacity Building in Client Countries Facilitated by Low Carbon Activities

Country / Region	Name of ESMAP Activity	Area and description of role of ESMAP activity in Building and / or Enhancing Client Capacity
Brazil	***Brazil Low Carbon Study***	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 main and the 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.
Poland	***Poland Climate Change***	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.
India	***Strategies for Low Carbon Growth***	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.
Mexico	***Mexico Low Carbon Study***	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.

5.5.2.5 Introduce Cutting-edge Solutions

A growing, useful knowledge and data set is emerging that can be used to both help other countries reduce their greenhouse gas emissions and help decrease the cost of mitigation. For example, Poland's innovative modeling work is providing a contribution to the literature on integration of top-down and bottom-up models in energy and climate change policy analysis that is already of interest for similar countries (like the Czech Republic and Hungary) that wish to conduct similar studies. Furthermore, the lessons and knowledge built during the work in Poland will be used in an ongoing low-carbon study for Macedonia.

Significant effort is underway in partnership with the World Bank Institute to identify and share lessons, approaches and new modeling tools for low carbon planning developed under this program with developing country partners, external organizations and World Bank Group staff. This includes new planning approaches and tools for macro-economic and bottom up-engineering modeling of energy supply and demand, transport, land-use and forestry. ESMAP and the WBI are developing briefing papers, training programs (face-to-face and e-learning) and tools (EFFECT model, MACTool) and are additionally contributing to global discussions with developing country clients (e.g. Vietnam, Nigeria) and bi-lateral organizations (e.g. US Low Emissions Development Strategy program, CLEAN network) to help inform their work and share the collective experience that is emerging.

Since the Low Carbon Growth Studies program is still under implementation and results are just starting to emerge, it is still premature to include low carbon activities with limited or no observable results at this time.

Annex 1 – ESMAP Portfolio of Activities FY2009-2011

1. Energy Assessments and Strategy Programs (EASP) under ESMAP Portfolio (FY2009-FY2011)

Project ID	FY	Country/Region	Project Name	Product Line	Output Type	Total Cost ('000s)	Status
P099257	2010	Africa	OIL SUPPLY LOGISTICS AND SECURITY FOR SMALL, OIL-IMPORTING AFRICAN COUNTRIES	TA Non-Lend	"How-To" Guidance	62	completed
P099315	2010	Southern Africa	SOUTHERN AFRICA POWER MARKET: INDICATIVE GENERATION & TRANSMISSION EXPANSION STUDY	ESW	Report	836	completed
P099234	2010	Africa	3A-ESMAP UTILITY PERFORMANCE (FY08)	Knowledge Product	Databases	130	completed
P109447	2011	Africa	INSTITUTIONAL FRAMEWORK DEVELOPMENT & CAPACITY BUILDING	TA Non-Lend	Institutional Development Plan	39	completed
P111483	2010	Africa	REGULATING ELECTRICITY EXPORTS AND IMPORTS IN SADC COUNTRIES: ROLES FOR NATIONAL REGULATORS	ESW	Report	300	completed
P114643	2010	Africa	WAPP BROADBAND PROGRAM ASSESSMENT	TA Non-Lend	"How-To" Guidance	288	completed
P103315	2011	East Asia and P	ENERGY AND SUSTAINABLE DEVELOPMENT	ESW	Report	322	completed
P098394	2009	China	CHINA SUSTAINABLE COAL SECTOR DEVELOPMENT	ESW	Policy Note	132	completed
P099609	2009	China	Munic. Heat Regu-Phse 1 Pre Inv of he-TF	Knowledge Product	Studies	127	completed
P100112	2010	Mongolia	MN - MITIGATION SECTOR REFORM AND TARIFF ADJUSTMENT	ESW	Report		completed

Project ID	FY	Country/Region	Project Name	Product Line	Output Type	Total Cost ('000s)	Status
P100209	2009	Mongolia	MONGOLIA URBAN HEAT PRICING & REGULATION	TA Non-Lend	"How-To" Guidance	67	completed
P106041	2009	China	CN-GENERATION PRICING, TRADG & DISPATCH	ESW	Policy Note	45	completed
P115088	2009	East Asia and P	COUNTRY ENERGY SECTOR VULNERABILITY ASSESSMENT; INDONESIA, PHILIPPINES AND VIETNAM	Knowledge Product	Studies	90	completed
P116044	2011	China	China Heat Regulation Phase II	TA Non-Lend	Client Document Review	143	completed
P119796	2011	Mongolia	Impact Diagnostic on the Global Economic Crisis and the Power Sector in Mongolia	ESW	Report	35	completed
P113836	2011	Vietnam	VN-FY09 CLUSTER-INFRA POLICY/REGU REFORM	ESW	Policy Note	36	ongoing
P119344	2010	Vietnam	Vietnam Financial Impact Assessment 2	Knowledge Product	Studies	69	completed
P082155	2009	Vietnam	VN-ESMAP-GAS MASTER PLAN	TA Non-Lend	Client Document Review	79	completed
P111444	2009	Vietnam	VN-Gas Sector Development Framework	TA Non-Lend	"How-To" Guidance	132	completed
P114377	2011	Mekong	POLICY AND CAPACITY BUILDING SUPPORT FOR GMS POWER TRADE	TA Non-Lend	Institutional Development Plan	151	completed
P090192	2009	South Eastern E	ESMAP: SEE GASIFICATION STUDY	TA Non-Lend	"How-To" Guidance	548	completed
P105103	2011	Turkey	Supporting Electricity Market Operations	TA Non-Lend	"How-To" Guidance	597	completed
P105332	2009	Ukraine	ESMAP: THERMAL POWER PLANT REHAB: ASSESSMENT OF NEEDS, COST AND BENEFITS	ESW	Report	105	completed

Project ID	FY	Country/Region	Project Name	Product Line	Output Type	Total Cost ('000s)	Status
P110874	2010	Hungary	ESMAP: SMART METERING	TA Non-Lend	"How-To" Guidance	86	completed
P112552	2010	Montenegro	PPP OPTIONS FOR ELECTRICITY GENERATION	ESW	Report	94	completed
P112423	2010	South Eastern E	SOUTH EAST EUROPE WHOLESALE MARKET OPENING	TA Non-Lend	"How-To" Guidance	356	completed
P114534	2011	Turkey	CAPACITY BUILDING FOR ELECTRICITY MARKET OPERATIONS	TA Non-Lend	"How-To" Guidance	224	completed
P118724	2011	Europe and Cent	IMPACT OF FINANCIAL CRISIS ON POWER SECTOR IN ECA COUNTRIES	ESW	Report	126	completed
P118225	2011	Bulgaria	BULGARIA GAS DIALOGUE	TA Non-Lend	Knowledge-Sharing Forum		ongoing
P122951	2011	ECA	Energy Trade in the Black Sea Region	Knowledge Product	Studies		ongoing
P123396	2011	Moldova	Moldova District Heating and Electricity Restructuring	TA Non-Lend	Institutional Development Plan		ongoing
P112754	2012	Ukraine	Reforming Energy Pricing in Ukraine	ESW	Report		ongoing
P108203	2012	World	Energy Sector Strategy	Knowledge Product	Studies	135	ongoing
P120423	2011	World	PRIVATE AND PUBLIC SECTOR ROLES IN THE POWER SECTOR: TOWARDS A NEW POLICY AGENDA?	ESW	Report	135	ongoing
P113129	2011	World	Power Sector Market Structure	ESW	Report	37	ongoing
P110201	2010	Central America	Programmatic Approach in Support of the Power Sector in Central America	ESW	Report	433	completed
P112430	2011	Latin America	LCR "A Strategic Overview on Energy Procurement and Best Practices in Energy	ESW	Report	201	completed

Project ID	FY	Country/Region	Project Name	Product Line	Output Type	Total Cost ('000s)	Status
			Auctions"				
P114009	2010	Latin America	ELECTRICITY SECURITY	ESW	Report	278	completed
P111012	2010	Peru	PERU NATURAL GAS STUDY	ESW	Report	99	completed
P118014	2010	Latin America	Impact of Credit Crisis on Energy in LAC	TA Non-Lend	"How-To" Guidance	74	completed
P119291	2011	Latin America	MANAGING THE IMPACT OF HIGH AND VOLATILE OIL PRICES	ESW	Report	178	ongoing
P104888	2009	Egypt, Arab Rep	EGYPT-DESIGN OF LOAD MANAGEMENT PROGRAM AND TIME OF USE TARIFFS	ESW	Policy Note	251	completed
P104087	2009	Morocco	STRUCTURING NEW ENERGY AGENCY - TF057954	TA Non-Lend	Institutional Development Plan	162	completed
P104800	2009	Tunisia	TN-REVIEW OF ENERGY MANAGEMENT POLICY	ESW	Report	457	completed
P107068	2009	Egypt, Arab Rep	ESMAP: EG-ENERGY PRICING STRATEGY	TA Non-Lend	"How-To" Guidance	464	completed
P106901	2009	Iran, Islamic R	IRAN: ELECTRICITY PRICING AND POWER SECTOR REFORM	TA Non-Lend	"How-To" Guidance	85	completed
P110581	2009	Syrian Arab Rep	SY - ELECTRICITY SECTOR STRATEGY	ESW	Policy Note	242	completed
P116206	2010	Middle East and	COUNTRY ENERGY SECTOR VULNERABILITY ASSESSMENT: EGYPT AND JORDAN	TA Non-Lend	"How-To" Guidance	70	completed
P107067	2010	Djibouti	DJ-ENERGY SECTOR MASTER PLAN	ESW	Policy Note	135	completed
P106446	2011	Middle East and	MNA-MAGHREB ENERGY MARKET STUDY	ESW	Report	66	completed

Project ID	FY	Country/Region	Project Name	Product Line	Output Type	Total Cost ('000s)	Status
P111861	2010	Middle East and	EXPLORE POTENTIAL ELECTRICITY TRADE AND INTERCONNECTION BETWEEN YEMEN, DJIBOUTI AND GCC COUNTRIES	Knowledge Product	Studies	85	completed
P113903	2010	Middle East and	5M-ASSESSMENT OF ENERGY INTEGRATION IN THE MASHREQ COUNTRIES	ESW	Policy Note	130	completed
P108120	2010	Morocco	ESMAP: MA-ENERGY SUPPLY STRATEGY	TA Non-Lend	"How-To" Guidance	185	completed
P116216	2010	Middle East and	COUNTRY ENERGY SECTOR VULNERABILITY ASSESSMENT: MOROCCO AND TUNISIA	TA Non-Lend	"How-To" Guidance	57	completed
P110209	2010	West Bank and G	SUPPORT TO DEVELOP STRATEGY FOR THE GOVERNMENT'S PUBLIC TRANSPORT SUB-SECTOR	TA Non-Lend	"How-To" Guidance	76	completed
P114431	2010	Yemen, Republic	RY-INSTITUTIONAL FRAMEWORK FOR ENERGY EFFICIENCY PROGRAM IMPLEMENTATION	TA Non-Lend	Institutional Development Plan	48	completed
P121712	2012	Egypt, Arab Rep	Cairo Congestion Study	ESW	Report		ongoing
P110853	2011	Jordan	Assessment of Institutional and Regulatory Framework for Electricity Trade in the Arab World	TA Non-Lend	"How-To" Guidance	45	ongoing
P105191	2009	India	INDIA: BEST PRACTICE IN ENERGY EFFICIENCY IMPROVEMENT IN COAL-FIRED GENERATION	ESW	Report	465	completed
P105194	2009	India	INDIA : REGULATORY AND PLANNING REQUIREMENTS FOR REHABILITATION OF COAL-FIRED GENERATION	ESW	Policy Note	291	completed
P111243	2011	India	ORG TRANSFORMATION & PPPS IN MSETCL	TA Non-Lend	Institutional Development Plan	210	completed
P090588	2009	South Asia	REGIONAL POWER TRADE	ESW	Report	87	completed

Project ID	FY	Country/Region	Project Name	Product Line	Output Type	Total Cost ('000s)	Status
P111245	2010	Sri Lanka	ENVIRONMENTAL ISSUES IN THE POWER SECTOR-CONSEQUENCES OF COAL BASED GENERATION	ESW	Report	207	completed
P116947	2012	South Asia	Ctry Eng Sectr Vulnerability Assmnt	ESW	Report		ongoing
P120587	2012	South Asia	SAR REGIONAL ENERGY SECTOR VULNERABILITY ASSESSMENT	ESW	Report	162	ongoing
P122931	2012	India	The Indian Power Sector - A stocktaking and directions for the future	Knowledge Product	Studies	1	ongoing
P123047	2012	Maldives	Developing a regulatory framework for Maldives energy sector	TA Non-Lend	"How-To" Guidance		ongoing
P122960	2011	Nepal	Nepal: Support to strategic energy sector development	TA Non-Lend	"How-To" Guidance		ongoing
P122369	2012	South Asia	South Asian regional energy assessment	TA Non-Lend	Knowledge-Sharing Forum		ongoing
P102843	2012	India	Understanding private sector participation in hydropower development	TA Non-Lend	"How-To" Guidance		ongoing
P109700	2010	Africa	SSA DOWNSTREAM PETROLEUM EFFICIENCY STUDY	ESW	Report	159	completed
P110294	2009	Africa	SSA REFINERY STUDY	ESW	Report	126	completed
P113882	2010	Latin America	EAP-Phase II (Energy, Env. & Population)	TA Non-Lend	"How-To" Guidance	160	completed
P109169	2011	World	NOCS CASE STUDIES	ESW	Report	279	ongoing
P108579	2010	World	Regional Energy Integration - Global Case Studies	Partnership	Partnership	319	completed
P110522	2009	World	RISK IN POWER SYSTEMS PLANNING	Knowledge Product	Operational Guide	129	completed

Project ID	FY	Country/Region	Project Name	Product Line	Output Type	Total Cost ('000s)	Status
P110342	2009	World	GEA BACKGROUND ENERGY PAPERS	Knowledge Product	Studies	20	completed
P116253	2011	World	EASP-Global Energy Assessment Phase 2	Knowledge Product	Studies	158	completed
P121518	2012	World	Flagship Electricity Technology Options Assessment Guide	Knowledge Product	Operational Guide	54	ongoing

2. Energy Access Activities under ESMAP Portfolio (FY2009-FY2011)

Project ID	FY	Country/Region	Project Name	Product Line	Output Type	Total Cost ('000s)	Status
P116277 P116289	2009	Africa	Lighting Africa - Conference (Task 2) Market Development (Task 3)	TA	Knowledge Sharing Forum	2199	ongoing
P116419	2010	Africa	Biomass Energy Initiative	TA	Knowledge Sharing Forum	1590	ongoing
P116908	2009	Africa	Gender and Energy	TA	"How-To" Guidance	400	ongoing
P117818	2010	Nigeria	Enhancing the Climate Resilience of Grow	ESW	Policy Note	100	ongoing
P118460	2009	Liberia	Catalyzing New Renewable Energy in Rural Liberia (Phase1)	TA	"How-To" Guidance	1456	ongoing
P118730	2010	Africa	Concentrating Solar Power (CSP) Regulatory and Financial incentives	ESW	Report	100	ongoing
P118980	2009	Africa	Decision Toolkit for Solar PV as Off-Grid Energy Solution for Community Services	TA	"How-To" Guidance	290	completed
P121306	2009	Africa	Africa Energy Access Scale-up Plan Consultations	TA	Knowledge Sharing Forum	600	ongoing
P073036	2011	Mali	Mali Energy Access for Productive Uses Project	PE	NA		ongoing

Project ID	FY	Country/Region	Project Name	Product Line	Output Type	Total Cost ('000s)	Status
P097818	2010	Rwanda	Rwanda GEF Sustainable Energy Development Project	GE	NA	2000	ongoing
P110075	2011	Benin	Modernizing Biomass Energy Services in Benin	PE	NA		ongoing
P114087-P114089 - P114094	2009	Namibia - Nigeria - Tanzania	Lighting Africa - Dev. Mark. Place Grants - LADM 4737 - 4260 - 4509 -	RE	NA	599	ongoing
P117260	2010	Tanzania	Lighting Rural Tanzania	PE	NA	1000	ongoing
P118460	2010	Liberia	Catalyzing New Renewable Energy in Rural Liberia (Phase2)	RE	"How-To" Guidance	NA	ongoing
NA	2010	Africa	Biomass Energy Initiative - Pilots grants	RE	NA	1353	ongoing
P120478	2009	Ghana Burkina Faso	Capacity Ugrading for the West African Partners -Renewable Energy Education Project - Ghana and Burkina Faso	RE	NA	900	ongoing
P110999	2008	Global	Africa Electrification Initiative	TA-NL	"How-To" Guidance	1,023	ongoing
P107301	2008	Tanzania	TZ-ESMAP-integrating SMEs in Tanzania's rural energy initiatives	TA-NL	"How-To" Guidance	144	ongoing
P107574	2008	Burkina Faso	Burkina-capacity building among small scale energy suppliers	TA-NL	"How-To" Guidance	24	completed

Project ID	FY	Country/Region	Project Name	Product Line	Output Type	Total Cost ('000s)	Status
P107606	2008	Cameroon	Cameroon-capacity building among small scale off grid energy suppliers	TA-NL	Client Document Review	108	completed
P108841	2008	Guinea	Guinea-scaling up SMEs participation in rural electrification	TA-NL	"How-To" Guidance	115	ongoing
P100860	2006	Africa	Identification and testing of inputs for enhanced electricity access package	ESW	Report	286	completed
P103456	2006	Africa	Implementing the action plan for energy access scale-up in Africa	TA-NL	"How-To" Guidance	1,413	completed
P104135	2006	Global	Work on Gender and Youth in EI	PT	NA	207	completed
P111450	2007	Global	Evaluation of Rural Electrification	RF	NA	596	ongoing
P099764	2006	Mongolia	Mongolia - rural energy project	TA-NL	"How-To" Guidance	55	completed
P095219	2008	Cambodia	Cambodia-ESMAP Decentralized energy services for IDA countries	TA-NL	Knowledge Sharing Forum	753	completed
P120983	2010	Lao	Stimulating small and medium enterprises (SME) for productive uses of electricity	TA-NL	Institutional Development Plan	58	ongoing
P107193	2008	Lao	Lao SMEs in decentralized energy service	TA-NL	"How-To" Guidance	262	completed
P109027	2007	Global	Solar lantern testing & certification project	TA-NL	"How-To" Guidance	204	completed

Project ID	FY	Country/Region	Project Name	Product Line	Output Type	Total Cost ('000s)	Status
P121383	2010	Global	Household energy access: lessons learned and scaling up opportunities	ESW	Report	22	ongoing
P114371	2009	Global	Review of strategies for sustainable production of commercial fuel-wood	PT	NA	150	completed
P109952	2008	Global	Gender and energy	ESW	NA	132	completed
P123004	2011	Global	Gender and energy development strategies program	TA-NL	"How-To" Guidance	21	ongoing
P111786	2010	Global	Gender and Energy GAP	PT	NA	34	ongoing
P116227	2009	Global	EASP - Benefits of Electrification (Yemen Case Study)	PT	NA	88	ongoing
P095153	2005	Global	ESMAP-decentralized energy services for IDA countries- global	TA-NL	Knowledge Sharing Forum	785	completed
P120429	2010		Joint Info-Dev/ESMAP SME Assessment	KP	NA	27	completed
P120447	2010	Global	ESMED Energy Access for Urban Poor	PT	NA	532	ongoing
P122107	2011	Global	ESMAP Study: Direct Delivery of Power Subsidy to Rural Areas	KP	Study	400	ongoing
P122999	2011	Global	ESMED Energy Access for Urban Poor - Outreach and Dissemination	KP	Study	280	ongoing
IFCSME	2007	Bolivia	Off-grid rural electrification SME program	KP	Study	NA	ongoing
P103968	2008	Haiti	Ht- Wood-fuel strategy- promotion of	TA-NL	"How-To"	452	completed

Project ID	FY	Country/Region	Project Name	Product Line	Output Type	Total Cost ('000s)	Status
			efficient cooking stoves		Guidance		
TBD	2011	Haiti	Ht - ESMAP TA for a strategic development of the energy sector	TA-NL	"How-To" Guidance	62	ongoing
TBD	2011	Central America	Central America Programmatic Study Module #7: Performance of Improved Cook Stoves in Central America	ESW	Report	11	ongoing
P110668	2007	Latin America and Caribbean	Benchmarking analysis of electricity distribution Center	KP	Study	118	ongoing
P103865	2008	Nicaragua	Ni-TA-improved small-scale energy supply	TA-NL	"How-To" Guidance	216	completed
P104354	2008	Peru	Small and medium enterprises for energy services delivery	KP	Study	374	completed
P105119	2008	Bolivia	Bo-Strengthening small scale off-grid energy suppliers	TA-NL	Knowledge Sharing Forum	278	ongoing
TBD	2011	Peru	Capacity Building for Productive Use of Energy in Peru	KP	Study	80	ongoing
P110667	2007	Latin America and Caribbean	Identifying traditional and non-traditional mechanisms for reaching the poor in infrastructure services	KP	Study	114	ongoing
P111241	2007	Bangladesh	The poverty impact of rural electrification: evidence from Bangladesh	ESW	Report	50	ongoing

Project ID	FY	Country/Region	Project Name	Product Line	Output Type	Total Cost ('000s)	Status
P083898	2007	South Asia	Bangladesh - addressing indoor air pollution	TA-NL	Institutional Development Plan	456	ongoing
P119673	2010	Global	Gender and energy development program	TA-NL	"How-To" Guidance	178	ongoing

3. Energy Efficiency Activities under ESMAP Portfolio (FY2009-FY2011)

Project ID	FY	Country/Region	Project Name	Product Line	Output Type	Total Cost ('000s)	Status
P099609	2009	China	Municipal Heat Regulation Phase I and Pre-investment Study	KP	Operational Guide	126.6	completed
P100209	2009	Mongolia	Mongolia Urban Heat Pricing & Regulation	TA	"How-To" Guidance	67.1	completed
P111239	2011	Afghanistan	Study on Energy Savings Opportunities in Large Buildings	TA	"How-To" Guidance	146.3	completed
P111927	2009	China	Survey & Knowledge Sharing On Energy Conservation	KP	Study	76.0	completed
P111246	2011	Pakistan	Support for the Development of a Large-Scale EE Program	TA	Client Document Review	40.6	completed
P104800	2009	Tunisia	Tunisia Review of Energy Management Policy	ESW	Report	456.6	completed
P109025	2010	China	EE Financing	KP	Operational Guide	8.5	completed
P112532	2011	Chile	Support for Development of National EE Program	TA	"How-To" Guidance	86.8	completed

Project ID	FY	Country/Region	Project Name	Product Line	Output Type	Total Cost ('000s)	Status
P116044	2011	China	China Heat Regulation Phase II	TA	Client Document Review	143.3	Ongoing
P108224	2009	Global	EE Cities Pilot	TA	"How-To" Guidance	39.7	completed
P114245	2009	Global	Energy Efficient Cities Practitioners Workshop	PT	NA	127.5	completed
P114056	2010	Global	Mainstreaming Building Energy Efficiency Codes in Developing Countries	TA	"How-To" Guidance	197.5	completed
P120480	2010	Global	EE In African Water Utilities	TA	"How-To" Guidance	96.2	completed
P114361	2010	Global	Operational Toolkit For Energy Efficient Lighting	KP	Study	131.9	completed
	2010	Global	Support to 5th Urban Research Symposium: Cities And Climate Change	PT	NA	135.0	completed
P113671	2011	Global	Transport & Climate Change	ESW	Report	74.1	completed
P115793	2011	Global	Tool for Rapid Assessment of City Energy (TRACE)	TA	"How-To" Guidance	422.6	Ongoing
P115770	2011	Global	EECI Small Grants (Quezon)	TA	Institutional Development Plan	182.3	completed

Project ID	FY	Country/Region	Project Name	Product Line	Output Type	Total Cost ('000s)	Status
P115771	2013	Global	EECI Good Practice Database & Awards	KP	Operational Guide	65.5	Ongoing
P115773	2013	Global	EECI Outreach & Dissemination	PT	-	216.8	Ongoing
P113570	2010	Moldova	District Heating Restructuring	ESW	Report	58.3	completed
P105834	2011	Vietnam	TA For GEF Vietnam DSM & EE Program	TA	"How-To" Guidance	42.0	completed
P114431	2010	Yemen	Institutional Framework for Energy Efficiency Program Implementation	TA	Institutional Development Plan	47.7	completed
P119866	2010	Global	Country EE Performance Indicators	KP	Study	99.0	completed
P112187	2011	Global	Public Procurement Of EE Services	TA	"How-To" Guidance	249.0	completed
P119918	2011	Global	EECI/Urban Mobility Strategies	TA	"How-To" Guidance	69.9	Ongoing
P120479	2011	Global	EE Cities Project Support Facility	TA	"How-To" Guidance	318.1	Ongoing
P120481	2011	Global	Energy M&T Pilot	KP	Operational Guide	201.8	completed

Project ID	FY	Country/Region	Project Name	Product Line	Output Type	Total Cost ('000s)	Status
P119287	2011	Vietnam	Fuel efficiency, trade facilitation and GHG reductions	KP	Study	97.6	completed
TBD	2012	Armenia	Study of Demand-Side Management Tools	TA	"How-To" Guidance		Ongoing
P123066	2012	China	EE in Government Facilities in China	TA	Institutional Development Plan		Ongoing
P124688	2012	Egypt	Egypt EE Strategy	ESW	Policy Note		Ongoing
P122924	2011	Global	EECI Small Grants (Zarqa)	TA	Institutional Development Plan		Ongoing
P113858	2011	Lebanon	Support for Thermal Building Standards (EE)	TA	"How-To" Guidance		Ongoing
P123396	2011	Moldova	District Heating and Electricity Restructuring	TA	Institutional Development Plan		Ongoing
P121039	2012	Tunisia	Tunisia GHG Mitigation Action Plan in Transport	TA	"How-To" Guidance		Ongoing
TBD	2012	Uzbekistan	EE Strategy for Industrial Enterprises in Uzbekistan	ESW	Report		Ongoing

4. Renewable Energy Activities under ESMAP Portfolio (FY2009-FY2011)

Project ID	FY	Country/Region	Project Name	Product line	Output type	Total Cost	Status
P109850	2010	Latin America	CCH LCR Guideline Scaling-up Wind Energy	Knowledge Management Product	Operational Guide	200K	Ongoing
P118293	2010	Mexico	Promoting Minihydro Development and other Renewables	Technical Assistance: Non-lending	Client Document Review	106K	Ongoing
P120452	2010	South Asia	Removing Barriers to Hydropower	Technical Assistance: Non-lending	Knowledge-Sharing Forum	100K	Ongoing
P118730	2010	Global	CSP: Regulatory and Financial Incentives	ESW	Report	111K	Ongoing
P112371	2009	Philippines	Renewable Energy Development	Technical Assistance: Non-lending	Study	438K	Ongoing
P110548	2009	South Eastern Europe and Balkans	South eastern Europe Regional Energy Efficiency and Renewables	ESW	Report	97K	**Completed**
P099544	2008	China	China Energy Intensity reduction strategy	ESW	Policy note	353K	**Completed**

Project ID	FY	Country/Region	Project Name	Product line	Output type	Total Cost	Status
P123227	2011	China	Evaluation of Incentive Mechanisms (Taxation and Pricing) for Wind Power in China	ESW	Report	100K	Ongoing
P115745	2011	Indonesia	Geothermal Risk Mitigation Framework in Indonesia	Partnership	Partnership	75K	Ongoing
P108023	2010	Belarus	Energy efficiency – Renewable Energy Legal and regulatory Framework Harmonization with the EU	PE		60K	Ongoing
P117927	2009	Bosnia	Bosnia Vrbas River Basin Hydro	Technical Assistance: Non-lending	Model/Survey	30K	Ongoing
P114534	2011	Turkey	Turkey Wind Integration	Technical Assistance: Non-lending	"How-To" Guidance	224K	Ongoing
P118280	2010	CA	Central America Programmatic Energy Study II: promoting renewable energy	ESW	Report	73K	Ongoing
P117870	2010	Mexico	Mexico Renewable Energy Assistance Program	Technical Assistance: Non-lending	"How-To" Guidance	371K	Ongoing
P113684	2009	MNA	North Africa Regional CSP Initiative	Knowledge Management	Study	709K	Ongoing

Project ID	FY	Country/Region	Project Name	Product line	Output type	Total Cost	Status
				Product			
P122591	2011	Yemen	Yemen Renewable Energy Framework	Technical Assistance (Non-lending)	"How-To" Guidance	80K	Ongoing
P119536	2010	India	India CSP Initiative	Technical Assistance: Non-lending	"How-To" Guidance	240K	Ongoing
	2011	India	Understanding private sector participation in hydropower development	PE			Ongoing
P121518	2010	Global	Flagship Electricity Technology Options Assessment Guide	Knowledge Management Product	Operational guide	54K	Ongoing
P107158	2007	Colombia	CO Alternative Energy and Biofuel	ESW	Report	89K	**Completed**
P108945	2007	Colombia	Identification of Policy Options for Renewable Energy Sources	Technical Assistance: Non-lending	Knowledge-Sharing Forum	109K	**Completed**
P103422	2006	Peru	Peru Small Hydro	ESW	Report	131K	**Completed**
P109969	2008	Peru	Overcoming Barriers to Hydropower Investment.	ESW	Report	185K	**Completed**
P110330	2007	Egypt	EG Commercial Wind	Technical Assistance:	"How-To"	90K	**Completed**

Project ID	FY	Country/Region	Project Name	Product line	Output type	Total Cost	Status
			development Framework	Non-lending	Guidance		
P113329	2008	Global	Clean energy technology acceleration	ESW	Report	126K	**Completed**
P101999	2006	Mozambique	MZ-Modern Biofuel Assessment (FY09)	ESW	Report	200K	Ongoing
P090657	2007	Slovakia	Establishing Regulatory Frameworks for Renewable Energy	Technical Assistance: Non-lending	"How-To" Guidance	178K	**Completed**
P107982	2007	Bulgaria	Building Regulatory Capacity for Renewable Energy Sources	Technical Assistance: Non-lending	"How-To" Guidance	160K	**Completed**
P110853	2011	Jordan	Assessment of Smart Grid Application to Jordan Transmission System	Technical Assistance: Non-lending	"How-To" Guidance	45K	Ongoing
P115422	2008	Latin America	Capacity Building in Renewable Energy for Implementing Agencies in Latin America	Technical Assistance: Non-lending	Client Document Review	88K	**Completed**

5. Low Carbon Activities under ESMAP Portfolio (FY2009-FY2011)

Project ID	FY	Country/Region	Project Name	Product Line	Output Type	Total Cost ('000s)	Status
P121622	2010	Global	Low Carbon Development in the Power Sector	ESW	Report	622	Ongoing
P121716	2010	Serbia	Serbia Low Carbon Energy Path	TA (non-lending)	Study	75	Ongoing
P114517	2010	Poland	Poland Climate Change	ESW	Report	260	Ongoing (TF closes March 31, 2011)
P108804	2010	Indonesia	Economic and Energy Policy Analysis to Address Climate Change	TA (non-lending)	Client Document Review	400	Ongoing (TF closes March 31, 2011)
P113561	2010	Global	Contribution to Carbon Foot Printing	Sector Strategy Paper	Sector Strategy Paper	23	**Completed**
P101264	2009	Morocco	Transport and Climate Change	ESW	Policy Note	110	**Completed**
P099544	2008	China	China Energy Intensity Reduction Strategy	ESW	Policy Note	500	**Completed**
P108304	2007	Mexico	Mexico Low Carbon Study	ESW	Report	630	**Completed**
P105702	2007	Brazil	Brazil Low Carbon Study	ESW	Report	920	Ongoing (TF closes March 31
P101555	2007	India	India: Strategies for Low Carbon	ESW	Report	561	Ongoing (TF

Project ID	FY	Country/Region	Project Name	Product Line	Output Type	Total Cost ('000s)	Status
			Growth				closes March 31)
P108461	2007	South Africa	South Africa Low Carbon Growth	ESW	Report	290	Ongoing (TF closes March 31)

Annex 2 – Classification of AAA and Other non Lending Products

WB Analytical Advisory Activities (AAAs) can be classified into Economic and Sector Work (ESW), Technical Assistance (TA), Donor Aid & Co-ordination (DA), Research Services (RE), World Development Report (WD), Impact Evaluation (IE) and External Training (TE). But of these, only the first two (ESW and TA) are of relevance for ESMAP activities. In addition, ESMAP activities fall under the classifications of Knowledge Products (KPs) and Partnerships (PT). The classifications that are of interest for ESMAP activities are described in more detail below.

I. Economic and Sector Work

Economic and sector work (ESW) forms the Bank's knowledge base and provides a foundation for carrying out the policy dialogue with external clients, building countries' analytic capacity, formulating and implementing effective lending programs, and influencing the development community. ESW is the largest category of analytic and advisory activities (AAA).

To qualify as an ESW, an activity must: (i) be undertaken with the intent to influence the policies and/or programs of an external client; (ii) involve original analytic effort and (iii) be “owned” by a specific Bank unit, representing the views of the Bank (not those of individual staff or consultants).

The Bank encourages client countries to participate in this process of building knowledge by contributing to the preparation and/or dissemination of ESW.

An ESW can also be prepared jointly by the Bank and other donors. Joint efforts reduce duplication and costs, making better use of resources from the international development community. As part of the harmonization and alignment of aid effectiveness, the Bank and other development partners committed to significantly increasing the share of coordinated analytic work —joint and participatory ESW—by 2010.

ESW outputs are the primary means to communicate the Bank's analytic work encompassing the analysis and advice necessary to strengthen policy dialogue. ESW activities are classified as either a "Report" (RPT) or "Policy Note" (POL).

Reports are comprehensive in-depth studies outlining policy recommendations. They address sector specific or thematic issues of high priority to provide upstream analysis for supporting and implementing effective lending programs and assessing their results.

Policy Notes provide "just-in-time" advice to a client on a range of development issues.

II. Technical Assistance (Non Lending)

Technical Assistance (non- lending) (TA) captures services provided by the Bank to clients as a way to assist them in policy / program implementation, developing / strengthening institutions, and facilitating knowledge exchange. TA (non-lending) is the second largest category of analytic and advisory activities (AAA) after economic and sector work (ESW).

TA is only one of the channels through which the World Bank Group enhances the capacity of its clients as capacity development is an integral part of all client services. The Bank delivers long-term capacity enhancement to client countries through other AAA tasks, various lending instruments e.g. technical assistance loans (or other instruments with a TA component). To qualify as TA , an activity must (i) have the primary intent of enabling an external client to implement reforms and/or strengthen institutions; (ii) be freestanding (that is, not comprise an essential part of a lending project or economic and sector work); and (iii) be linked to a World Bank unit with clear accountability for the service provided.

TA output represents the means by which the Bank enables an external client to implement reform and strengthen institutions.

Output type	*Description with example*
Institutional Development Plan (IDP)	Advice on client-owned blueprint for institutional strengthening, ranging from broad-based strategies to fully implementable plans, which could include the sequencing of activities, resource allocation, key issues, objectives, and other action items.
"How-To" Guidance(HTG)	Operational advice on policy/program formulation and hands-on implementation, including technical notes, step-by-step instructions, good practice manuals, and procedural guidelines.
Model/Survey (MOS)	Advice on client-driven data collection and analysis used for projections, forecasting, and simulations.
Client Document Review (CDR)	Advice and review of client-owned documents that could include draft legislation, regulation, PRSP inputs, and grant proposals.
Knowledge-Sharing Forum (KSF)	Bank-facilitated, client-managed meetings aimed at sharing international good practice, exchanging knowledge, catalyzing reform, and building consensus on a particular issue.

III. Knowledge Management Products (KP)

Knowledge Management (KM) Activities are those activities that support the Bank's key business processes through the production, retention, and dissemination of knowledge. Knowledge is an integral

part of everything the Bank does.

It is not the primary intent of internally focused Knowledge Management activities to directly influence external clients. In this way, they are distinct from the Bank's AAA products, such as ESW and TA. However, clients may have direct access to these Knowledge Management products and processes. In fact, this increases their effectiveness.

To qualify as a KP, an activity must (i) have a clear objective to support the Bank's key business processes through the production, retention, and dissemination of knowledge; (ii) be self-standing, i.e., not a part of another Bank deliverable (e.g., CAS, AAA, or lending) or other core business function; and (iii) have Bank staff as the primary audience, with the clear understanding that sharing with externally audiences often adds value to the product.

A Knowledge Management Products is associated with the Knowledge Production business process until it is delivered ("Delivery to Client" milestone in SAP), after which it is associated with the Knowledge Dissemination business process until the product is finalized/completed.

Output type	*Description with example*
Studies.	This type of knowledge product aims to explore thinking on a particular sectoral, thematic, or other core area of the Bank's business. While the studies may be shared with external audiences, its main objective is to support the Bank's business or to generate discussion within the Bank. Examples include recent studies carried out by the Infrastructure Network on "Specialized financial intermediaries for local infrastructure finance", or a study in the Africa Region on "Investing in Agricultural Productivity".
Operational Guides	Oftentimes referred to as "toolkits," "handbooks," or "guidelines," this type of knowledge product takes many different forms. Whether based on a review of current or past practice to generate good/best practice in a particular area, or on other analytical work(s) to recommend a standard approach to a specific topic, the goal of the product is to mitigate risks, improve quality or impact, or increase the efficiency of the Bank's work by distilling information into more applicable forms. Examples include web-based toolkits that guide Bank staff in how to treat specific topics in a specific policy area (disability in PRSPs or Core Labor Standards toolkit), best practice in preparing standard documents (such as a CAS) or how to maximize the impact of operations in a specific area (e.g., Community Participation Manual). "
Databases.	Creation, maintenance or updating of large databases that store structured data and/or other information that is relevant to the Bank's work. Examples include the Africa live database, EdStats, or the HIPC Debt Relief database.

IV. Partnership

PT activities are those undertaken to advance global advocacy issues or initiate/strengthen relationships with partners as part of the global advocacy agenda. PT projects include preparation activities--such as assessments, working papers, reports, communications, and responses to requests for information from Governments, donors, and NGOs-and participation in conferences within and outside of the Bank, cross-institutional working groups, and international committees.