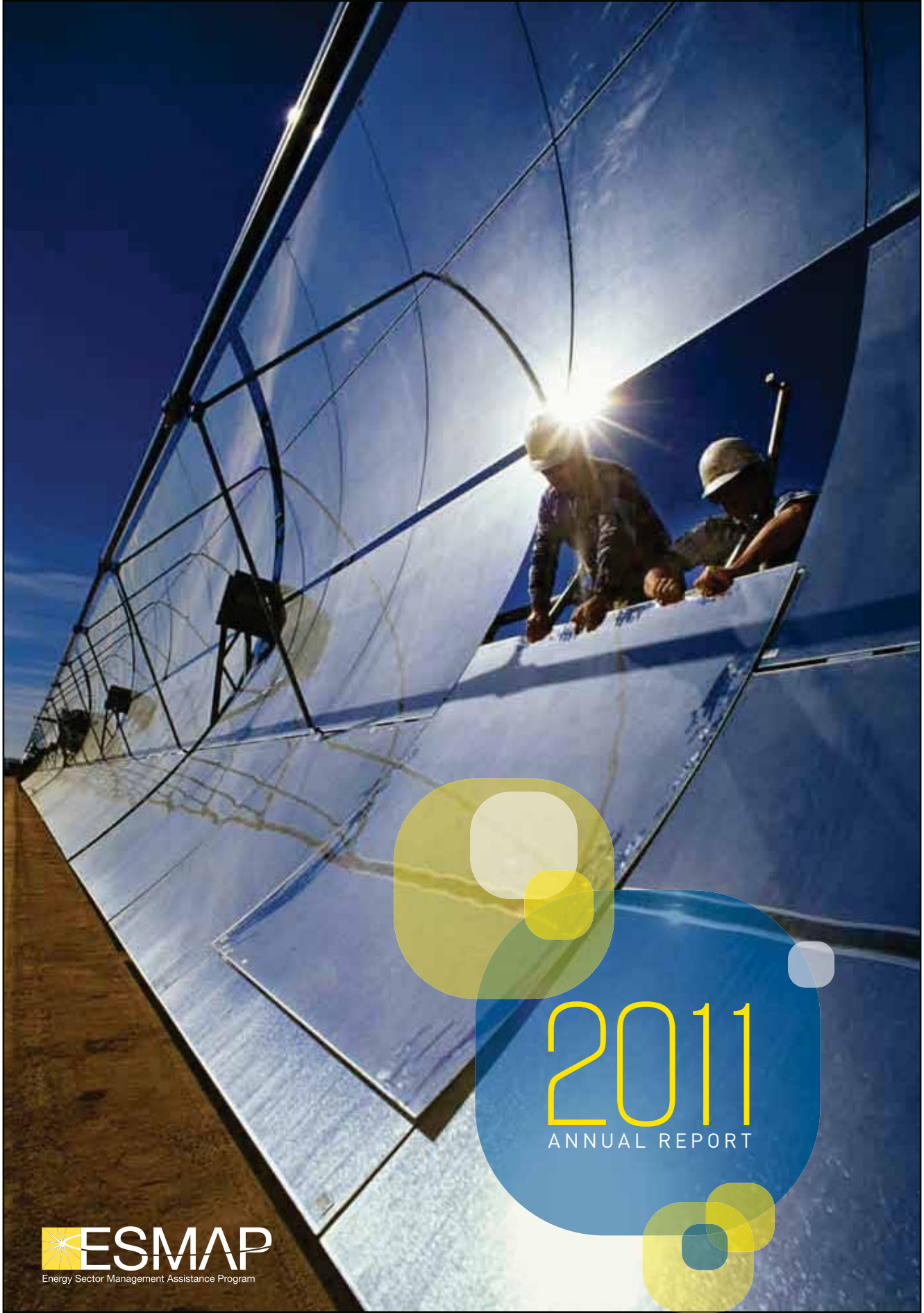


2011 ANNUAL REPORT

ESMAP
Energy Sector Management Assistance Program

MISSION

The Energy Sector Management Assistance Program (ESMAP) is a global knowledge and technical assistance program administered by the World Bank. It provides analytical and advisory services to low- and middle-income countries to increase their know-how and institutional capacity to achieve environmentally sustainable energy solutions for poverty reduction and economic growth. ESMAP is funded by Australia, Austria, Denmark, Finland, France, Germany, Iceland, Lithuania, the Netherlands, Norway, Sweden, and the United Kingdom, as well as the World Bank.

TABLE OF CONTENTS

CHAPTER 1

HELPING TO SHAPE THE ENERGY FUTURE

For almost 30 years, the Energy Sector Management Assistance Program (ESMAP) has helped low- and middle-income countries develop and implement sustainable energy policies, strengthen institutions and invest in infrastructure to support poverty reduction and economic growth.

By virtue of its location in the World Bank, ESMAP plays a unique role at the nexus of energy and development. ESMAP helps its clients achieve access to reliable, affordable, and modern energy services by connecting global experts with policymakers, carrying out in-depth energy sector assessments at the national and regional levels, and building an ever-growing body of knowledge on effective responses to energy challenges. At the same time, ESMAP informs a wide range of the World Bank's lending and technical assistance in the energy sector.

Through this work, ESMAP has had a lasting impact on energy regulations, institutions, and programs in developing and transition countries around the world.

A CHANGING ENERGY LANDSCAPE

The world is facing a quickly changing energy landscape shaped by volatile prices for fossil fuels, uncertain supply, fast-paced technological change, and climate risks. A key development priority for the global community is to achieve significant progress on the combined challenge of eliminating energy poverty, providing increased energy security, and effecting major reductions in, or avoiding future, greenhouse gas emissions.

BOX 1.1

CONSULTATIVE GROUP

ESMAP is governed by a Consultative Group (CG) made up of representatives from contributing donors and chaired by the Director of the Sustainable Energy Department of the World Bank, on behalf of the Vice President of the Sustainable Development Network. The CG meets annually to review the strategic directions of ESMAP, its achievements, and its use of resources and funding requirements.

ESMAP's donors are:

Australia
Austria
Denmark
Finland
France
Germany
Iceland
Lithuania
Norway
Sweden
The Netherlands
United Kingdom
The World Bank

BOX 1.2

TECHNICAL ADVISORY GROUP

A Technical Advisory Group (TAG) of international experts provides independent opinions to the CG about the purpose, strategic direction, and priorities of ESMAP. The TAG also provides advice and suggestions to the CG on current and emerging global issues in the energy sector that are likely to impact ESMAP's client counties.

In FY2011, the TAG members were:

Judi Wakhungu
Winfried Rijssenbeek
Wolfgang Mostert

Developing countries' interest in and investments toward renewable energy and energy efficiency have grown by leaps and bounds in recent years. Access to energy has become a critical challenge for national governments, which face the prospect of failing to achieve many of their development goals due to energy shortages and unreliable provision of energy services.

The past decade has seen a significant increase in World Bank energy lending — from under US$1 billion in Fiscal Year (FY) 2001 to over US$8 billion in FY2011. At the same time, the World Bank portfolio is becoming more diverse, with a growing emphasis on low carbon growth and cleaner and more efficient energy to the 2.7 billion people who rely on traditional biomass fuel for cooking and heating, in addition to interventions that bring electricity access to the 1.3 billion people worldwide who currently are in the dark.

The substantial growth in the size and complexity of the World Bank's energy portfolio has been accompanied by increasing demand from clients for more analytical work and technical assistance to help define policy options and program priorities as well as to build institutional capacity.

ESMAP has expanded its operations in response to these evolving needs, with a corresponding growth in what the program has been able to accomplish. In the past three fiscal years (FY2009–11), ESMAP activities contributed to the identification and design of approved World Bank energy lending of US$11.75 billion.[1] In FY2011 alone, ESMAP supported over 130 analytical and advisory activities to inform energy policies and investments and improve sector governance, with over US$16 million in grants disbursed.

Key ESMAP achievements in FY2011 include the following:

- Supported Lighting Africa, which has reached close to 1.5 million people with cleaner,

1 For details, please see Annex III.

quality-certified off-grid lighting products in Sub-Saharan Africa

- Informed World Bank lending for the scale up of concentrated solar power (CSP) in the Middle East and North Africa that is expected to accelerate local manufacturing, entrepreneurship and job creation

- Produced Low Carbon Growth Studies for South Africa, India and Poland that identify greenhouse gas mitigation opportunities and the financial, technical, and policy requirements for transition to a low carbon development path

- Delivered country-specific "market transformation" strategies to help plan for large-scale integration of renewable energy for India, Mexico, and Peru

- Through the Energy Efficient Cities Initiative (ECCI), informed World Bank lending operations by synthesizing best practices and implementation lessons on public procurement of energy efficiency services and building energy efficiency codes from around the world

- Launched HEAT, the Hands-on Energy Adaptation Toolkit, which provides step-by-step guidance for practitioners as they conduct a risk assessment of climate vulnerabilities and adaptation options for a country's energy sector

- Integrated gender-sensitive approaches to improving access to energy services into World Bank-financed energy projects in Mali, Kenya, Senegal, Benin, and Tanzania

- Demonstrated positive results from the use of TRACE, the Tool for Rapid Assessment of City Energy, which offers cities a quick and user-friendly way to assess their energy efficiency and identify key areas for improvement, in Indonesia, Turkey, the Philippines, and Vietnam

REORIENTING FOR RESULTS

To meet growing demand from clients, ESMAP is adjusting its work program and areas of focus, while maintaining the thematic priorities from its current Strategic Business Plan. This reorientation is based on five "core principles" for ESMAP's work going forward:

Help shape the future: ESMAP's focus will be on research and analysis that influences the strategic direction of the energy sector. ESMAP's current portfolio should be a leading indicator of the World Bank's future investment portfolio in the energy sector.

Scale up to respond to increased client demand: ESMAP will scale up in areas of increasing client focus and rapidly rising demand, including household energy, municipal energy efficiency, and results-based financing for clean energy access.

Measure results and demonstrate impacts: ESMAP will invest greater resources in measuring the performance of its programs. Accountability for outputs and outcomes will be critical elements of ESMAP's monitoring and evaluation processes.

Maintain relevance to the World Bank's regional operations: The strength of ESMAP as a global program has been its strong links to country clients through the World Bank's regional operations units. ESMAP-managed analytical and knowledge activities will be targeted to and aligned with country-level needs.

Working across teams: ESMAP's teams will be increasingly cross-cutting, drawing on the expertise of staff working across different programs and initiatives.

New Framework for Program Areas and Grants

A newly-formed **Clean Energy** team has incorporated the work of the Renewable Energy Market Transformation Initiative (REMTI) as well as work being done by ESMAP on low carbon development and climate change. The Pro-Poor Energy Access Technical Assistance Program (PEA-TAP) has

been subsumed into the work of a new **Energy Access** team, which will also support the Africa Renewable Energy Access Program (AFREA). The **Energy Efficient Cities Initiative (EECI**) and the **Energy Assessments and Strategies Program (EASP)** will continue to focus on sector issues — such as utility performance, governance, and credit-worthiness, as well as strengthened energy sector planning — with adjustments for changing client needs. This reorganization more clearly delineates ESMAP focus areas while allowing teams to continue to work together closely to support the World Bank's regional units and collaborate on cross-cutting themes.

To improve its operational leveraging, ESMAP has also made enhancements to its Annual Block Grants (ABGs) to the World Bank's regional energy sector units. Going forward, these grants will include a variable performance-based allocation determined by: (i) the amount of energy lending of the regional units; (ii) the disbursement performance of prior years' ESMAP grants; (iii) regional cofinancing budget contributions to ESMAP-supported activities; and (iv) World Bank lending influenced by the region's ESMAP-supported activities. To initiate country dialogue on 'frontier' sector issues, incentives will also be included in the ABGs for the regional units to undertake more cross-cutting activities, such as those in the urban, water, transport, and environment sectors.

Cross-Sectoral Themes

In both its global analytical work and in its support to the work of the regional units, ESMAP is devoting increasing resources to such cross-cutting themes and frontier issues.

To integrate **gender** considerations into energy projects, ESMAP is developing a gender "toolkit" for World Bank task teams. Based on ongoing work on gender and energy in Mali, Senegal, Benin, Tanzania, and Kenya (see Chapter 3), the toolkit includes best practices and guidelines for assessments, indicators, and monitoring that can be used to ensure that both men and women benefit from, and are empowered by, energy projects. Examples of such best practices include the appointment of a gender focal point in the rural energy agency in Mali and an assessment of a livelihood activity in Benin that led to engagement with local communities to spread the benefits of the program to women.

There is mounting evidence that strong energy sector performance is underpinned by **effective and transparent governance**. Poorly designed and administered regulatory institutions can adversely affect the provision of energy services to the poorest of society. A recent survey in South Asian countries found that power consumers faced endemic petty corruption. More than 60 percent of the electricity users surveyed reported irregular connection processes and direct payment to utility office staff. In view of the considerable importance of improving regulatory and market-oriented governance in the energy sector, ESMAP is encouraging clients to submit proposals through the ABGs to strengthen the corporate governance of public utilities; help client governments and state agencies establish open and fair legal, regulatory, contractual and fiscal frameworks; systematically collect governance data; and make information regularly available to both the public at large and sector stakeholders.

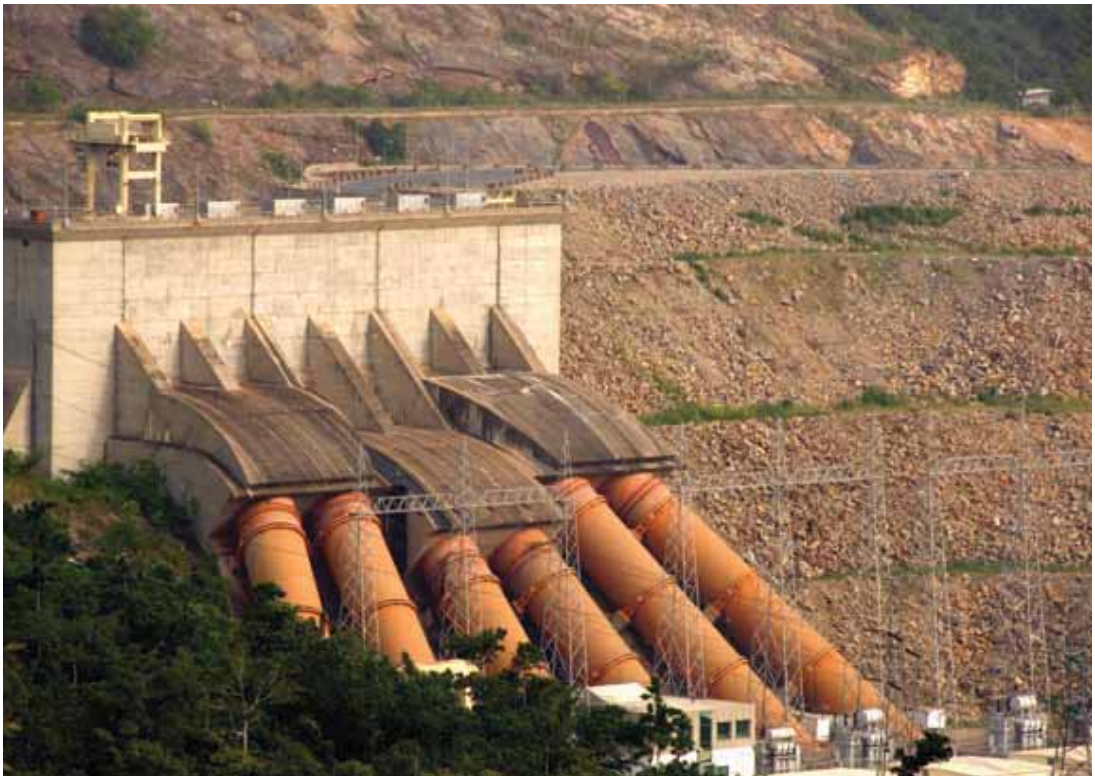
A number of countries face a **professional skills gap** that impedes the development and effective running of their power sectors. Emerging economies require an ever-growing number of skilled personnel to meet increasing energy demands, while small- and low-income developing countries may lack trained professionals across entire competencies. In Africa, ESMAP activities include training in the design, installation and management of solar systems, as well as an assessment of the needs of Economic Community of West African States (ECOWAS) countries in hydropower development. In South Asia, a comprehensive study reviewed the skills gap in the power sector in India. In the Middle East, an ESMAP study looked at the potential for skills development as CSP is developed in North Africa (see Chapter 2).

M&E and Communications

In line with the core principles above, a new monitoring and evaluation (M&E) system for ESMAP was implemented in FY2011. The new system goes a step beyond measuring the delivery of outputs, focusing on specific development outcomes. Since July 2010, when the new M&E results framework became operational, several enhancements have been implemented, including more robust rules for the identification and measuring of outcomes, assigned reviewers for monitoring of specific activities, and use of data collected through the M&E system for ESMAP management decision making.

As ESMAP's portfolio grows and demand increases for its services and knowledge products, it faces substantially greater needs for communication and dissemination support. ESMAP is developing a new communications strategy and is putting in place an integrated communications, publications, and web team. The team is focused on:

- Expanding the dissemination of ESMAP knowledge products to ensure they reach policymakers, practitioners, World Bank operational staff and other key audiences
- Improving the packaging of ESMAP knowledge products — including technical reports, guidance notes, toolkits and planning tools — so that they are accessible, consistent, and easy to use
- Enhancing the quality of core communications products — including brochures, the monthly bulletin, the program website, and social media channels — to better deliver key messages and information about ESMAP findings, achievements, and results
- Supporting the communications needs of new ESMAP initiatives and partnerships, including outreach about the program's work to new audiences



Building on Lessons Learned

The realignment of focus areas and strengthening of operational functions demonstrate ESMAP's commitment to respond to client needs. The global analytical and advisory work done by ESMAP's core team is developed based on feedback from client countries as well as from the regional units, which work closely with client countries on their energy policy needs. Proposals for ESMAP support for regional work through the ABG process are required to be based on demand from client countries and demonstrate a close relationship with these countries' and regions' energy sector priorities.

Institutionally, ESMAP has continuously improved its processes and capacities as it incorporates lessons learned. Over the past two years, in response to recommendations from the Technical Advisory Group, donors, and clients, ESMAP has:

- Integrated its funding with the World Bank's budget cycle so that funds are available to the regional units at the beginning of the fiscal year
- Improved the grant approval process so that proposals can now be approved in a matter of days and weeks, rather than months
- Strengthened the program's capacities in energy poverty and renewable energy by hiring new expert staff
- Met the growing demand for studies on low carbon growth at the country level
- Developed new initiatives and helped the World Bank develop a stronger presence in the areas of household energy and cooking fuels

On the operational level, lessons learned from analytical and advisory activities are incorporated directly into new ESMAP activities and into World Bank lending operations. One example is the experience of AFREA (see Chapter 3), which has demonstrated the value of having a flexible source of funding available for both World Bank-executed and recipient-executed activities, with pilot projects that complement lending operations in Sub-Saharan Africa. Programmatic, multi-year activities under AFREA were found to be particularly effective, especially in scaling up renewable energy and to address complex energy access issues. At the same time, AFREA has found that its recipient-executed grants are much more effective if channeled through national rural energy agencies, reducing administrative costs for both the World Bank and recipients.

NEW INITIATIVES AND PARTNERSHIPS

ESMAP is also taking on new initiatives that will expand ESMAP's operational leveraging impacts; increase the focus on energy access, particularly in Africa; scale up results-based financing in the energy sector; and respond to client needs in pursuit of low carbon, climate-resilient energy sector development.

Special Initiative for Africa: AFREA II

ESMAP and the World Bank's Africa Energy Unit have proposed a new special initiative for Africa: the second phase of AFREA, to support sustainable energy solutions for improved access to modern energy services in Sub-Saharan Africa. This follows on the success of the original AFREA program financed by the Netherlands (see Chapter 3).

AFREA II would promote increased access to energy, with an emphasis on the development of renewable energy, meeting basic household energy needs, and low carbon energy sources. The initiative would also support the creation of an enabling environment for regional cooperation and private sector participation in energy generation, transmission and distribution. Specific activities would include:

- Support to rural energy agencies and utilities
- Continued support to Lighting Africa (see Chapter 3)
- The Africa Clean Cooking Initiative, a new initiative drawing on the Lighting Africa model, piloting and promoting improved cook stoves, improving sustainability of wood-fuel supply, inter-fuel substitution, and development of biomass energy strategies

- Disseminating information and building capacity among stakeholders to improve access and scale up renewable energy
- Low carbon development, energy efficiency, and climate change adaptation programs
- Building private-public partnerships (PPPs) for the delivery of sustainable energy services.

Program on Results-Based Funding for Energy Sector Development

Results-based funding refers to development assistance that is provided in response to verified results, rather than providing funding up-front for inputs. There is increasing interest in results-based approaches from both client and donor countries, but their deployment in the energy sector has been limited in comparison to other sectors such as health, information and communication technology (ICT), and transport.

In response, ESMAP has initiated a two-year work program that aims to assess how, and under what circumstances, results-based approaches can be used to improve outcomes and scale up financing for energy sector development. It will support the design, implementation, and assessment of results-based funding approaches — with a particular focus on opportunities under the Climate Investment Funds (CIF) and Energy+ (an international initiative to accelerate efforts towards universal access to energy, energy efficiency, and low carbon development).

ESMAP will work with the Global Partnership on Output-Based Aid (GPOBA), as well as the CIF and Energy+ to develop a broad range of results-based activities, with a focus on market expansion, private sector investment, and innovation.

Partnership on Low Carbon and Climate Resilient Energy Strategies

ESMAP and the Climate and Development Knowledge Network (CDKN) have partnered to offer clients the opportunity to leverage additional funds for low carbon and climate resilient strategies in the energy sector.

CDKN is a United Kingdom-based alliance of six private and not-for-profit organizations, launched in March 2010. Given the commonality of interest at CDKN and ESMAP in supporting research, advisory services, knowledge management, and capacity building for climate-compatible development, the two organizations have agreed to link the FY2012 ESMAP call for proposals with CDKN's program through matching grants. A particular objective is to deliver the analytical work and technical assistance necessary for ESMAP's clients to position themselves for future climate finance.

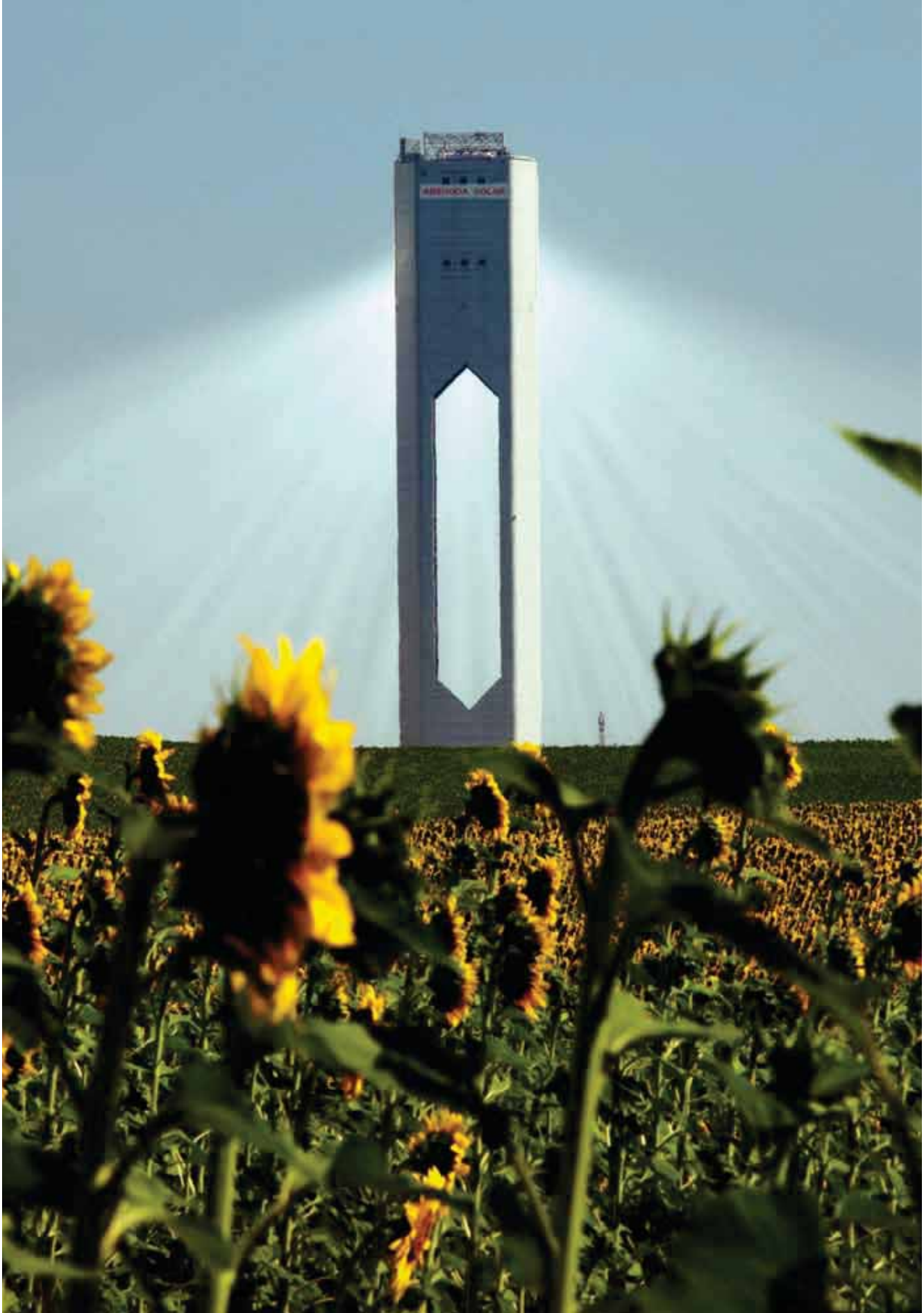
Support to Small Island States

The United Nations Development Programme (UNDP), the World Bank, and ESMAP, in close consultation with the Alliance of Small Island States (AOSIS) and the Government of Denmark, have established a program to support the Small Island Developing States (SIDS) to transition to low carbon economies through development and deployment of renewable energy and energy efficiency.

The program, known as SIDS-DOCK, is expected to achieve the following outcomes in the near term:

- Creation of enabling legal and institutional environments in SIDS to remove barriers and implement renewable energy and energy efficiency policy reforms based on international best practice
- Implementation of projects that develop, deploy, and demonstrate renewable energy and energy efficiency initiatives for potential scale-up through climate finance and other sources of funding

ESMAP will be responsible for the overall management of the program's activities, which would be carried out by the World Bank's regions with counterparts at the country level to ensure that activities are incorporated into clients' development strategies.



CHAPTER 2

ACCELERATING THE TRANSITION TO CLEAN ENERGY AND LOW CARBON DEVELOPMENT

BOX 2

ESMAP ACHIEVEMENTS IN FY2011 UNDER THE CLEAN ENERGY PROGRAM

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

FY2011: HIGHLIGHTS & ACHIEVEMENTS

Global investment in clean energy has undergone a quantum leap in the last decade. Middle-income and developing countries are becoming the largest markets for renewable energy investments. Facing substantially increased energy demand from economic growth and rapidly expanding urban populations, volatile prices for traditional fuels, and energy security concerns, these countries are increasingly putting greatere emphasis on the transition to renewable sources of energy in national development planning.

ESMAP is directly engaged in helping countries to develop the new policies, institutions, and regulations that support this transition. The program's analytical work takes best practices from around the world and demonstrates how they can be adopted for specific country and regional circumstances. Toolkits and handbooks build upon a large spectrum of international experience to address specific renewable energy issues, helping clients identify, develop and implement investments and policies. ESMAP's advisory work helps to build consensus around low carbon growth plans and prepares clients to access sources of concessional financing.

RENEWABLE ENERGY MARKET TRANSFORMATION: INDIA, MEXICO, AND PERU

ESMAP's Renewable Energy Market Transformation Initiative (REMTI) was designed to help developing countries manage this transition through market transformation strategies, renewable energy deployment roadmaps, and exchange between countries on best practices. The work under REMTI has led in turn to more ambitious requests for assistance, particularly in developing PPPs and mobilizing concessional financing. As ESMAP is reorienting to meet these new demands, REMTI has been subsumed into ESMAP's new Clean Energy program.

In FY2011, notable examples of renewable energy market transformation studies were completed for India and Mexico. The work in India was well received at the highest levels of government and facilitated follow-up support by the World Bank

(see Box 2.1). In Mexico, the project team worked closely with the Secretariat of Energy on a broad range of assistance, including an economic evaluation of renewable expansion in power generation, a study on the design of renewable energy auctions, and a national renewable energy inventory. The economic evaluation estimated that by 2030 hydropower could make up 12 percent of the installed capacity in the country's power sector, with wind and geothermal providing substantial additional generation.

ESMAP also assisted Peru in reassessing the role of hydropower in the energy mix and building an operational framework to manage the hydropower sector. Coming at a time when the country was trying to meet rapidly increasing demand for electricity, this assistance focused on strengthening the government's role in sector planning, pricing policy, concessions and licensing, and project financing. A report, *Peru: Opportunities and Challenges of Small Hydropower Development*, published in March 2011, found that there was considerable potential for small hydropower in the country, estimated at 1,600 MW.

HARNESSING THE SUN: CONCENTRATING ON CSP

Concentrated Solar Power (CSP) is becoming a growing area of focus for ESMAP as governments press ahead to mobilize large-scale investments to tap the potential of this technology to deliver utility-scale reliable electricity. In FY2011, ESMAP supported work on CSP scale-up in South Africa and in India, including analysis of the economics of local production and sourcing of CSP components.

The most significant work in this area to date, however, has been carried out in the Middle East and North Africa. In FY2010, ESMAP supported an assessment of the potential for local manufacturing to enable CSP scale-up in this region. The report, released in July 2010, makes the case that the region can generate substantial income and employment from CSP deployment at scale. The report was presented at a regional workshop in Cairo cohosted by Egypt's New and Renewable Energy Authority, and the results of the study were disseminated at a workshop in Morocco in June 2011, attended by national renewable energy agencies, as well as representatives of the private sector and the donor community.

This work has informed international efforts to finance the scale-up of CSP in North Africa, involving the World Bank, the African Development Bank, and donor agencies from Europe, the Middle East, and Japan. Much of the funding for this effort will come from a Clean Technology Fund investment plan that leverages both public and private investments.

The first project in this program is Ouarzazate I, a 500 MW complex in Morocco that will be one of the largest CSP installations in the world. In line with the objectives of Morocco's Solar Plan and the findings of the ESMAP assessment, Ouarzazate I encourages local research and development, skills development and training. In November 2011, the World Bank approved US$297 million in financing for the project. Other CSP plants in North Africa are now in the pipeline, including the 100 MW Kom Ombo plant in Egypt and a 50 MW CSP project in Tunisia.

The World Bank in June 2011 published an ESMAP-supported discussion paper that reviews international CSP efforts to date to draw lessons on regulatory and financial incentives to accelerate further expansion. The paper recommended establishing policy incentives for local manufacturing of CSP components and suggested a combination of reverse auctions and feed-in tariffs as an effective combination of incentives for developing countries that are just entering the CSP market.

LOW CARBON STUDIES: ROADMAPS FOR SUSTAINABLE GROWTH

Through its **low carbon development studies**, ESMAP works with countries to assess the potential for greenhouse gas mitigation consistent with their national development strategies and identify the policies and financing

necessary for the transition to sustainability, particularly in the energy sector.

To date, ESMAP has supported Low Carbon Growth Country Studies in seven major emerging economies: Brazil, China, India, Indonesia, Mexico, Poland, and South Africa. Given the differing country contexts, the findings of these studies have varied widely. The Poland report describes a transition to a low carbon economy that is attainable provided early abatement measures are taken, and focuses the attention of policymakers on energy efficiency in the transport sector. The India study examines a range of potential "carbon futures" for that country, and helps prioritize policy measures to reduce energy intensity in large industries. The study also helped inform follow-on work by the World Bank to support India's efforts to transition to renewable energy (see Box 2.1).

The potential catalytic effect of ESMAP's work in this area was clearly demonstrated in Mexico. The ESMAP-supported study *Low Carbon Development for Mexico* (known by its Spanish acronym, MEDEC) evaluated possible interventions in five sectors: electric power, oil and gas, stationary energy end-use, transport, as well as agriculture and forestry. Recommendations included development of a bus rapid transit system, expansion of efficient lighting and appliances programs, and the scale-up of wind energy. The study found that Mexico had great potential for low carbon growth — that if the MEDEC recommendations were followed, Mexico by 2030 could experience significant growth in gross domestic product (GDP) and per capita income while still keeping emissions at 2008 levels. Following the release of the report, the World Bank's engagement in Mexico's planning process has increased substantially, with a US$400 million Low Carbon Growth Development Policy Loan approved in November 2010. Two other loans by the World Bank and the Clean Technology Fund, for sustainable transport and energy efficient appliances, drew heavily on the findings of the MEDEC study.

TOOLS FOR MITIGATION AND ADAPTATION PLANNING

The low carbon studies point to a new direction of economic development, and demonstrated the importance of planning tools to help design the policies and investments needed to move towards green growth.

ESMAP has contributed significantly to the development of **knowledge tools** to guide decision-making about climate change mitigation and low carbon growth. **EFFECT** — the Energy Forecasting Framework & Emissions Consensus Tool — developed largely while preparing the India low carbon study, analyzes greenhouse gas emissions growth for a range of development scenarios. By looking at both energy demand and supply, EFFECT develops 25-year emissions forecasts in a transparent way to help build consensus on emissions growth reduction interventions and investment plans.

MACTool — the Marginal Abatement Cost Tool — developed through the Brazil Low Carbon Country Case Study, gives planners the ability to quickly compare the costs and benefits of mitigation options by measuring their marginal abatement cost, the cost per ton of carbon emissions avoided.

ESMAP has also developed a new initiative to test measures and investments for mitigating the exposure of the energy sector to climate risk. Climate vulnerability, risk and adaptation assessments for the energy sectors of Albania and Uzbekistan were conducted in 2009 and 2010. **HEAT**, the Hands-on Energy Adaptation Toolkit, builds on the lessons from these assessments. HEAT is now available to other countries and provides a step-by-step guidance framework to lead energy practitioners through a risk assessment of climate vulnerabilities and adaptation options.

HIGHLIGHTS OF NEW ESMAP-SUPPORTED CLEAN EFFICIENCY ACTIVITIES BY THE WORLD BANK'S REGIONAL UNITS

India: Understanding Private Sector Participation in Hydropower
This study reviews the underlying policy and regulatory framework for private sector participation in hydropower at both the national and state level. A comprehensive inventory of private sector hydropower initiatives is intended to capture comparative information about the characteristics of these projects, highlighting specific tariff determination methods and approaches to financing. These in turn will be compared with experience from other countries with similar resource endowments, particularly in Latin America, to provide recommendations about the sustainable development of hydropower in India.

Assessment of Smart Grid Application to Jordan's Transmission System
Jordan has embarked on a plan to boost renewable energy to 10 percent of total electricity generation by 2020. This starting point is expected to exploit the country's location as a future gateway through which renewable electricity could be exported to Europe either from Jordan itself or from other countries in the Middle East. The present status and operations of Jordan's electricity grid will be reviewed, with a view to deployment of smart grid technologies, including increased automation, demand management systems, and increased access of renewable electricity to the grid. This activity also includes a review of the best practices of other countries in deploying smart grid programs.

Climate Change Implications for Growth in the Non-Oil Sector in Nigeria
This project evaluates the potential threats and opportunities posed by climate change to Nigeria's economic growth, with a focus on potential impacts on the Lagos Metropolitan Area from the present out to 2050. This work will include development of reference and other climate change scenarios for Nigeria, modeling potential impacts and the effectiveness of adaptation options, and development of policy and investment recommendations to enhance climate resilience.

Geothermal Risk Mitigation Framework in Indonesia
Indonesia's geothermal power potential is estimated at 27 GW, roughly 40 percent of the world's resources. Despite this potential, so far less than 4 percent of the total geothermal resources in Indonesia have been developed to produce power. The World Bank is helping Pertamina Geothermal Energy (PGE), the leading public sector developer, to improve its operational and managerial capacity to meet industry and international standards. This study reviews the lessons learned during the preparation of two major PGE projects to draw out good practices for the development of geothermal resources around the world.

Serbia Low Carbon Energy Path
This study supports the development of a strategy note to help policymakers in Serbia improve the sustainability of power generation, facilitate investment, and allow the national power sector to effectively compete in the regional power market. A particular focus is possible linkages between gas, district heating, and renewable generation. The strategy note assesses the impact of regional developments and the prospect of electricity markets for the Western Balkans.

BOX 2.1

A WARM RECEPTION FOR RENEWABLES IN INDIA

An ESMAP-backed report, *Unleashing the Potential of Renewable Energy in India*, created a splash when it was released in India in February 2011. The launch generated significant media attention, with articles highlighting a central point of the report: if the government is to meet its target of expanding renewable installed capacity by 40 GW by 2022, substantial financial and regulatory barriers will have to be addressed.

Access to grid power in India remains low, leaving about 400 million people without coverage. At the same time, demand for electricity is expected to grow rapidly, and generation capacity will have to expand five-fold in the next 25 years to keep pace. Development of renewable energy sources can help meet this demand while mitigating fuel price volatility and increasing energy security.

The report estimates that India has 150 GW of renewable energy potential, of which only 10 percent was being realized as of 2009. Most of the remainder — including 90 percent of the renewable capacity in wind, biomass, and small hydropower — is economically feasible when the environmental premiums on coal are brought into consideration.

To improve the operating environment for renewable energy, the report recommends streamlined, market-based government interventions to take the place of a number of current incentive programs, the establishment of a national renewable energy fund, and the creation of dedicated renewable energy parks. It highlights the lack of adequate grid interconnections as one of the largest obstacles and recommends making the expansion of transmission infrastructure for renewable energy a top priority.

In April 2011, India's Environment Minister at the time, Jairam Ramesh, sent a letter to Prime Minister Manmohan Singh, drawing attention to the report. At the same time, World Bank engagement with India on the scale-up of renewables has intensified. ESMAP's low carbon country growth study for India was published, helping India prepare for US$750 million in financing for environmentally sustainable growth activities through the Clean Technology Fund.

An assessment of India's regulation of renewable energy was carried out, with a comparative analysis of the country's use of feed-in tariffs, renewable purchase obligations, and renewable energy certificates. A study has also been undertaken to better understand risk perceptions of solar developers for CSP projects in India, which is expected to contribute towards the successful implementation of the Jawaharlal Nehru National Solar Mission announced in January 2010.

A global flagship report *Climate Impacts on Energy Systems* was published in FY2011. The report is a compendium of what is known about climate trends and weather variability, and takes a comprehensive look at the potential impacts of these changes on energy resources, infrastructure, and demand. The report argues that the energy sector must weigh emerging climate conditions and their impacts on design, construction, operation, and maintenance on par with other business risks. It recommends an integrated risk-based planning approach to address these risks while operating in an environment of uncertainty.

FY2012–13: TARGETING RESOURCES TO CLIENT NEEDS

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

BOX 2.2

WINDS OF CHANGE ACROSS ASIA

The Winds of Change report focuses on sustainable energy development in East Asia's middle-income countries: China, Indonesia, Malaysia, the Philippines, Thailand, and Vietnam. The study, supported by ESMAP along with the Governments of Australia and Japan, was published as a flagship report for the World Bank's East Asia region and followed an unprecedented ramp-up in renewable energy deployments across the region in the late 2000s.

The study proposes a strategic direction for the region to move to a sustainable energy path over the next two decades, and presents policy tools and financing mechanisms to get there. The main conclusion is that large-scale deployment of energy efficiency and low carbon technology could stabilize the region's greenhouse gas emissions by 2025, significantly improve the environment, and strengthen energy security without compromising economic growth.

The report was presented in December 2010 at the Philippines' Renewable Energy Forum. Following the forum, Philippines Energy Secretary Jose Almendras invited World Bank experts to join a roundtable in Manila to advise the Philippines government on implementation of the Renewable Energy Act, passed in 2008. The roundtable brought together the heads of major Philippines government agencies concerned with renewable energy and industry representatives. The World Bank experts advised the Department of Energy on how to best implement renewable portfolio standards and feed-in tariffs based on international experience.

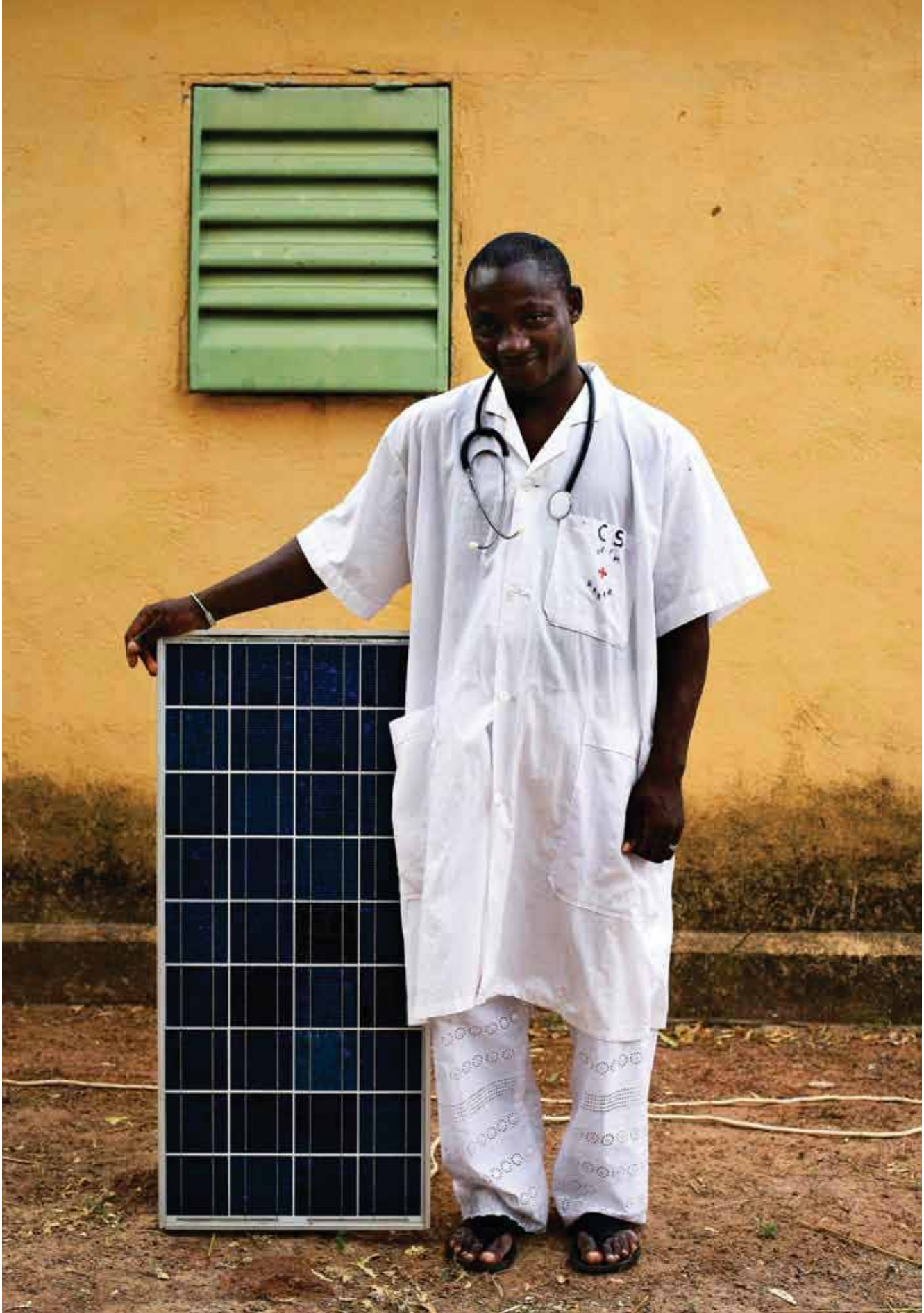
Successful consultations on the flagship report were also held with the governments of China, Vietnam, Thailand, Malaysia, and Indonesia. Participants in these consultations endorsed the findings of the report and stressed the importance of rationalizing energy pricing, as well as the potential for regional cooperation and knowledge exchange, particularly on energy efficiency and low carbon technologies.

The Clean Energy Program will target its analytical work and the development of tools and toolkits to the needs of clients, particularly as they prepare for climate and low carbon development financing. Several activities are being identified to support clean energy scale-up and to systematically address issues from renewable energy resource identification to investment planning, policy design, and skills development. Among the activities planned for FY2012–13 are:

Renewed focus on geothermal energy. The demand for baseload electricity has never been greater, and countries are taking a fresh look at geothermal and next-generation hydropower as cleaner sources of reliable supply. ESMAP will publish a landmark *Handbook on Planning and Financing Geothermal Power Generation* in mid 2012 to provide advice to practitioners and investors on how to design, finance, and implement geothermal projects. The handbook is designed as a global knowledge product, drawing on lessons from around the world, and is already being utilized by World Bank teams in Ethiopia and Kenya. Another 2012 ESMAP study will focus specifically on a region with high geothermal potential: Central America. This assessment looks at the barriers that have prevented the region from exploiting its geothermal resources, and how to overcome those barriers and manage up-front risks.

Grid integration and smart grids. Continuing on the work it has done to assist clients with technical issues as they scale up renewable energy generation, ESMAP will carry out analytical work and targeted technical assistance to facilitate grid integration with renewable sources of power and the deployment of smart grids. Current work underway includes a study of storage and integration issues for systems combining renewables and natural gas, and a global project to enhance the ability of World Bank staff to advise clients on smart grid technologies.

Clean energy technologies training. In view of growing demand from client countries for assistance in the demonstration, deployment, and transfer of low carbon technologies, ESMAP proposes to reinforce and expand the knowledge base of staff at the World Bank and other multilateral development banks by developing and offering a clean energy technologies training program. The program would be accompanied by a series of guidebooks on clean energy technologies and an updated and expanded, web-based Renewable Energy Toolkit targeted to World Bank technical staff and project developers.



CHAPTER 3

FIGHTING ENERGY POVERTY

BOX 3

ESMAP ACHIEVEMENTS IN FY2011 UNDER THE ENERGY ACCESS PROGRAM

- Supported Lighting Africa, which has reached close to 1.5 million people with cleaner, quality-certified off-grid lighting products in Sub-Saharan Africa
- Partnered with the Global Alliance for Clean Cook Stoves, an international PPP formed with the goal of adoption of clean and efficient stoves and fuels in 100 million homes by 2020, and launched a global mapping study on cook stove programs
- Through AFREA, assisted Liberia to establish a renewable energy agency and explored the potential for CSP in southern Africa
- Integrated gender-sensitive approaches to improving access to energy services into World Bank-financed energy projects in Mali, Kenya, Senegal, Benin, and Tanzania
- Continued to support the Africa Electrification Initiative (AEI), a dynamic platform for representatives from African energy ministries, utilities, regulatory entities, research centers, and nongovernmental organizations (NGOs) to share practical information on ground-level implementation issues

FY2011: HIGHLIGHTS & ACHIEVEMENTS

Improving access to modern energy services for the poor has been at the heart of ESMAP's work for almost 30 years. More recently, this issue has come to the forefront for many countries, with the recognition that key national development goals will remain out of reach without a concerted effort to fight energy poverty. Pressure is increasing on governments and their development partners to expand the delivery of reliable energy services, and to do so in a sustainable manner. Energy access has also moved to the top of the international agenda. The United Nations has declared 2012 the Year of Sustainable Energy for All, and a campaign by the same name, led by the UN Secretary General, calls for universal access to modern energy services by 2030.

ESMAP is responding to these new demands by producing globally applicable analytical work that will inform new programs, testing results-based approaches for improved energy access, and building new partnerships to combat energy poverty on a broad front.

FOCUSING ON HOUSEHOLD ENERGY

Over 2.7 billion people around the world continue to rely on traditional biomass fuels for their cooking and heating needs. For people in these communities, the absence of affordable, reliable energy has significant consequences for human health, welfare, and economic development. Women and girls are particularly affected, as they are usually responsible for collecting firewood and cooking. Smoke inhalation from traditional stoves and open fires is a major cause of respiratory disease. The World Health Organization estimates 1.9 million deaths annually result from indoor air pollution.

Helping to address this multidimensional household energy challenge has become one of the primary focus areas for ESMAP in recent

years. The report *Household Energy Access for Cooking and Heating: Lessons Learned and Way Forward* provides recommendations on how the World Bank can scale up investments in household energy projects, based on lessons learned from previous work. A total of 31 projects from 1989 through 2010 were surveyed. Among the findings were that a holistic approach to household energy issues was necessary, and needs and preferences of end-users should inform the design and dissemination of cooking devices.

In late 2010, ESMAP joined the Global Alliance for Clean Cook Stoves, an international PPP formed with the goal of adoption of clean and efficient stoves and fuels in 100 million homes by 2020. The partnership has benefits for both ESMAP and the Alliance, which can build on the numerous scoping studies and pilot projects on cook stoves that ESMAP has supported. ESMAP has since participated in the development of the Alliance's *Strategy for Universal Adoption of Clean Cook Stoves and Fuels*, published in November 2011. ESMAP and the Alliance have also jointly launched a global study to map existing stove programs and identify priorities in scaling up their promotion.

ESMAP is now in the process of developing a suite of analytical studies that will inform household energy interventions globally (see the FY2012–13 section below for details).

AFREA

A key pillar of ESMAP's energy access work is **AFREA**, the Africa Renewable Energy and Access Program. AFREA was established in 2008 as a special ESMAP program for Sub-Saharan Africa, reflecting the pressing need to develop scalable, innovative solutions to close the region's energy access gap. AFREA finances multi-year activities focused on new ways of expanding access, such as Lighting Africa (see Box 3.1) and the Sector-Wide Approach (SWAp) for Energy Planning. It also develops studies and knowledge products designed to address specific needs in the region.

A toolkit on solar photovoltaic (PV) energy for community service facilities, produced in FY2011, provides guidance on how hospitals, schools, and local government agencies can ensure the long-term sustainability and maintenance of their off-grid solar PV installations. Such systems can be difficult to maintain and repair, especially for poor and remote communities. The toolkit argues for putting as much attention on organizational frameworks, maintenance, and operations in the post-project period as on initial budgeting and procurement.

A core element of AFREA's work is technical assistance and advisory work targeted to the needs of specific countries and sub-regions within Africa. In FY2011, AFREA assisted Liberia to set up a renewable energy agency (see Box 3.2), and supported work exploring the potential for CSP in southern Africa.

AFREA also provides grants directly to governments in the region to carry out activities that complement existing World Bank operations. These grants are based on specific demands from clients as they expand the use of renewable energy technologies. In FY2011, these included scale up of solar and biofuels, village mini-grids in Mali, small grants for innovative proposals for delivering affordable micro-energy services to rural areas in Tanzania, and building the capacity of two universities in Ghana and Burkina Faso to provide renewable energy education.

The Biomass Energy Initiative for Africa, under AFREA, has funded the implementation of nine biomass pilot projects in eight Sub-Saharan African countries. In Rwanda and Tanzania, charcoal producers have been trained in more efficient and sustainable techniques of production. In Uganda, a pilot project has been commissioned to generate electricity from biodegradable waste.

BOX 3.1

LIGHTING AFRICA

Lighting Africa is a World Bank/ International Finance Corporation (IFC) initiative, supported by ESMAP, which seeks to accelerate the adoption of clean off-grid lighting technologies by households and businesses throughout Sub-Saharan Africa. The goal is to provide cleaner, more affordable lighting to 2.5 million people by 2012 and 250 million people by 2030. The program consists of five basic components, designed to address specific market barriers:

- Quality Assurance: Establishing quality specifications and developing testing methodologies to promote the manufacturing and distribution of quality products
- Market Intelligence: Informing the design of suitable products for the African market
- Business Support and Access to Finance: Assisting manufacturers and distributors in achieving their business goals and supporting new business models to deliver low-cost and high-quality off-grid lighting, and supporting distributors and consumers to locate potential sources of funding
- Consumer Education: Generating awareness about and building demand for modern off-grid lighting products
- Policy and Regulation: Engaging governments to create an enabling policy and regulatory environment and supporting them in integrating modern off-grid lighting in their electrification plans

To date, 18 products from 12 companies have met Lighting Africa's quality standards, and their manufacturers and distributors now receive support from the program. The products range from small task lamps to larger battery pack, multi-light systems, retailing between US$20–80. Nearly all of them charge mobile phones in addition to providing light.

The program has been piloted in Kenya and Ghana. Since 2010, close to 1.5 million people in Africa have acquired access to cleaner, safer, better lighting with Lighting Africa quality-certified off-grid lighting products. Over 300,000 quality-certified systems have been sold since 2010 (when Lighting Africa started monitoring sales), and it is almost certain that Lighting Africa's target of 500,000 systems by 2012 will be surpassed.

A comprehensive consumer awareness program was rolled out in Kenya and Ghana, educating consumers about off-grid lighting alternatives to enable them to make informed purchasing decisions. The campaign reached 11 million people in rural Kenya and 675,000 people in Ghana.

A separate AFREA activity in Tanzania, developed in cooperation with the Lighting Africa program, is providing support to the Rural Energy Agency in providing innovation grants to 10 local organizations for piloting sustainable business models to bring clean, quality, and affordable lighting to remote rural areas in Tanzania.

Lighting Africa is now expanding as a pan-African program. The lessons learned from the pilot countries of Kenya and Ghana are being packaged and adapted to other countries in the region. Lighting Africa has designed a scale-up plan targeting three sub-regions — East Africa, Anglophone West Africa, and Francophone West Africa. Apart from Kenya and Ghana, Lighting Africa is active in Ethiopia, Liberia, Mali, Senegal, and Tanzania.

BOX 3.2

BUILDING A NEW FOUNDATION FOR RENEWABLE ENERGY IN LIBERIA

Liberia has been rebuilding from a series of civil wars that damaged much of the country's energy infrastructure. At the end of 2011, only 1.5 percent of the people living in the capital Monrovia had access to publicly provided electricity, and no access was available in areas outside of Monrovia. Most people rely on small gasoline and diesel generators, kerosene, candles, firewood and charcoal to meet their energy needs. Even if Liberia is able to provide electricity to its people in line with its National Energy Policy, which calls for 30 percent of the population to have access to electricity by 2015, the majority will remain off the power grid for a long time to come.

Modern renewable energy sources will be crucial in making a difference in people's lives. To this end AFREA support has been key in helping establish Liberia's first ever dedicated Rural and Renewable Energy Agency (RREA). AFREA provided strategic, technical, and legal support to Liberia's Ministry of Lands, Mines and Energy to set up the agency, as well as training for its new staff on renewable energy technologies and annual plan development. "Without AFREA, the setting up of Liberia's RREA would have probably taken many more years," says Augustus Goanue, RREA's Executive Director.

AFREA financing is also helping to leverage two specific types of renewable energy — micro-hydropower and solar energy. The construction of a pilot micro-hydropower plant is well under way in Lofa County, which is to demonstrate how village-owned and operated micro-hydropower plants can be put in place in Liberia. In parallel, the introduction of affordable, high-quality solar systems is being fostered. The RREA itself will have a solar system installed on its roof to serve as a demonstration project.

Women and girls are disproportionately affected by a lack of access to modern energy services. AFREA's Gender and Energy program is a cross-cutting initiative that attempts to integrate gender considerations into the work not only of AFREA but of rural energy agencies in the region (see Box 3.3).

The original objective for AFREA in 2008 was to implement activities that directly support and create enabling conditions for increased renewable energy investments and expanding access to modern energy. In looking at three examples of activities under AFREA, it is clear that this objective has been met and surpassed:

- 1.5 million people provided with access to safe, clean lighting through Lighting Africa
- US$1.75 billion mobilized for expanded electricity access in Kenya and Rwanda as part of the SWAp program, with SWAp work ongoing in Ethiopia.
- Establishment of the Africa Electrification Initiative to create a body of practical knowledge for practitioners in the region (see below).

However, energy needs in Sub-Saharan Africa remain complex, diverse, and urgent. Over 650 million people in the region still lack access to modern energy services. While AFREA has had successes to date, it is clear that its work is just beginning.

AFREA's first phase, financed by the Government of the Netherlands, is now winding down, and ESMAP and the World Bank's Africa Region have designed the next phase, AFREA II, focused on sustainable energy access expansion, renewable energy and energy efficiency scale-up, and regional cooperation on generation and transmission. See Chapter 1 for details.

BOX 3.3

GENDER AND ENERGY IN AFRICA

In Kenya, Mali, Senegal, and Tanzania, the groundwork is being laid for a new vision of energy access that addresses the needs of both men and women. Since 2010, AFREA's Gender and Energy Program has been applying a gender-sensitive approach to energy project design and policy dialogue in African countries. Productive feedback is now being provided on these issues as trainers and policymakers visit villages and collect direct accounts from men and women. This feedback is integrated into the World Bank's operations, research, and policy dialogues with client countries.

In Mali, work on gender is already integrated into the International Development Association and AFREA cofinanced Household Energy and Universal Access Program. A key intermediate outcome of this work is the appointment of a gender focal point within the rural energy agency, AMADER — a first of its kind in the region. Based on the agency's work in hundreds of villages in the past few years, a full gender and energy needs assessment has been carried out for Mali, which will be used to develop training and capacity building activities for rural communities.

"Already, improving domestic energy access, changing woodfuel use, modernizing cook stoves, and powering up rural health centers, has enormously improved women's quality of life and income generating ability. Now, much of the work needs to focus on getting cheaper technologies to reduce electricity prices," says Madame Niang, AMADER's gender focal point.

EXPANSION OF ACCESS TO RURAL AND POOR URBAN COMMUNITIES

Complementing its work on household and community energy, ESMAP in FY2011 continued to carry out activities to support the expansion of modern energy services to underserved populations, such as poor communities on the outskirts of fast-growing cities, poor and remote rural areas, and urban slums.

In Nepal, less than 30 percent of the rural countryside is connected. An ESMAP-funded study — *Power and People: The Benefits of Renewable Energy in Nepal* — argues that decentralized renewable energy such as solar and micro-hydropower can fill the gap in rural areas, helping to meet the government's targets of generating 10 MW from micro-hydropower projects and providing access to electricity to 12 percent of the population through off-grid systems.

In Africa, the ESMAP-AFREA financed Africa Electrification Initiative (AEI) has become a dynamic platform for representatives from African energy ministries, utilities, regulatory entities, research centers, and NGOs to share practical information on ground-level implementation issues relating to rural, peri-urban, and urban electrification. Since the original meeting in Maputo, Mozambique in 2009, practitioners have been able to access an online database of discussion papers and idea forums, available through the AEI website.

Urban poor populations in South Asia and Sub-Saharan Africa are projected to grow by 50 percent by 2025. This will put tremendous pressure on cities in these regions as they work to provide energy and other municipal services to poor communities. ESMAP in FY2011 carried out a study on best practices for delivering energy services to the urban poor in developing countries. The study found that factors, such as collaborative stakeholder engagement and community empowerment, were critical in enabling better service delivery and promoting microenterprises as energy providers. In Bangladesh, a system was established to distribute liquefied petroleum gas (LPG) cylinders through the training of mobile dealers, improving local energy security and livelihoods at the same time. In Brazil, electricity service in a slum community in Salvador was expanded from 6,000 households to 200,000 after the power distribution company made a multi-year effort to reach out and engage community members through trusted local agents and NGOs, and set up a social fund by reinvesting part of the earnings from new connections.

HIGHLIGHTS OF NEW ESMAP—SUPPORTED ENERGY ACCESS ACTIVITIES BY THE WORLD BANK'S REGIONAL UNITS

Capacity Building for Productive Uses of Energy in Peru

The Government of Peru is committed to improving the rate of rural electrification, increasing coverage from an estimated 55 percent at the end of 2010 to 88 percent by 2020. This work looks at the potential productive uses of electricity in rural areas based on pilot projects under the national electrification program. Activities include an assessment of the needs of local businesses and entrepreneurs, marketing and promotion about productive uses to local communities, and coordination with the electricity distribution company. Over 4,700 small businesses and cooperatives are covered under the first three pilot projects.

The Road to Durban: Africa Energy Ministers' Event

This activity supported a conference of African Energy Ministers prior to the UNFCCC's 17th Conference of the Parties (COP-17) in Durban, South Africa, in December 2011. The conference intended to enhance African countries' ability to develop low carbon growth strategies and to raise awareness about climate negotiations and Africa's energy sector challenges among the ministers and potential negotiators.

Strategic Development of Household and other Energy Sectors in Haiti

Even before the 2010 earthquake, less than 30 percent of households in Haiti were connected to electricity, and coverage in the countryside was extremely low. Over 80 percent of the population depends on traditional biomass fuels for cooking. This project aims to help the Government of Haiti develop technical and managerial capacity in the energy sector, in order to coordinate the design and implementation of policies and sector investment operations post- earthquake. This includes a household energy investment program and the design and preparation of a program on energy access for the poor with an emphasis on productive uses.

Performance of Improved Cook Stoves in Central America

There is a concerted effort in Central America to improve the performance of cook stoves and to promote these stoves in communities using traditional cooking methods. ESMAP is supporting the development of a toolkit that will facilitate decision-making around cook stoves for developers, donors, and governments. The toolkit will assess the technical performance of various cook stoves and look at socioeconomic and cultural aspects around adoption of improved stoves.

FY2012–13: GLOBAL KNOWLEDGE PRODUCTS AND PARTNERSHIPS

As part of its commitment to addressing the growing demand from clients for technical assistance on energy access, ESMAP is planning a series of knowledge products in FY2012 that will address global aspects of the household energy challenge.

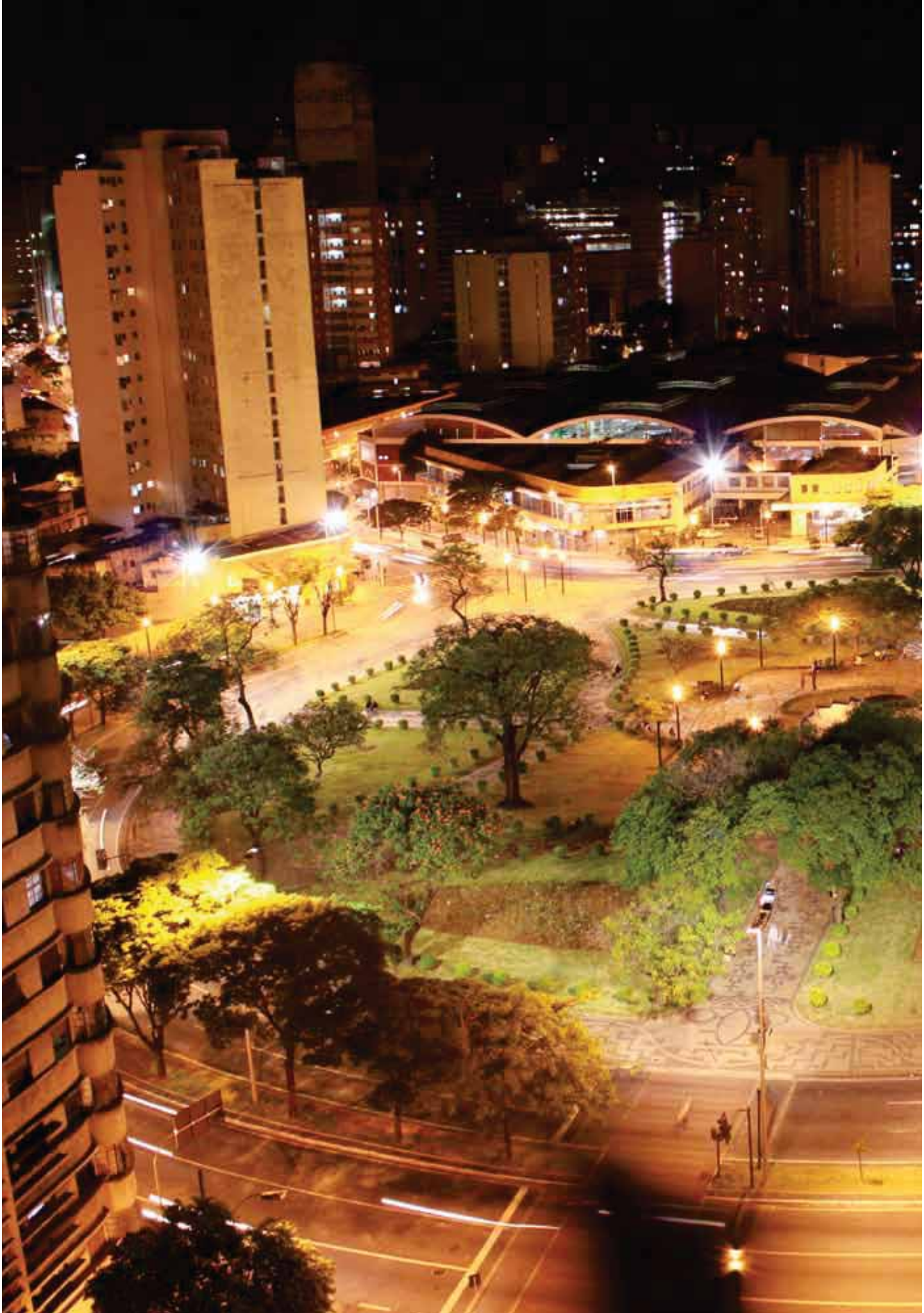
A guidance note on household energy will be prepared for World Bank operational staff and their clients to capitalize on the World Bank's existing knowledge and experience in this area to help inform new interventions. Among the topics covered will be ensuring a sustainable biomass fuel supply, stove performance and selection issues, and the treatment of subsidies and carbon finance. There is a lack of economic studies that cover both the supply and demand chains of household fuels for cooking and lighting. An upcoming ESMAP report on the economics of household energy is expected to fill this gap by assessing the costs and benefits of household energy interventions.

ESMAP will work in partnership with a number of other organizations, such as GIZ, UNDP, UNIDO, IEA and Practical Action, on a framework for defining and measuring access to energy that builds on and enhances work done by these organizations. The goal is the establishment of an approach to defining and measuring energy access that is adopted by the World Bank and partner agencies. An approach that takes into account "tiers" of access could help demonstrate the linkages between different dimensions of energy access and aspects of poverty alleviation.

As part of its continuing partnership with the World Bank's Africa Region, ESMAP will support the launch of the Africa Clean Cooking Initiative (ACCI), a market transformation program to promote enterprise-based, large-scale dissemination and adoption of clean cooking solutions in Sub-Saharan Africa. In the initial stages, ACCI involves the design of country programs that will help identify target market segments and the identification and implementation of pilot programs.

ESMAP is building on its work on urban energy access issues by convening a community of practice that will bring together government representatives, energy practitioners, and community members to develop a technical assistance program to support policies for the urban poor. On the rural side, ESMAP is undertaking a study to explore emerging methods of delivering power subsidies to farmers in India — such as ICT tools and smart meters — that do not jeopardize the health of power utilities or the sustainability of groundwater resources.

ESMAP's strong track record in energy access — its analytic work and support to investment projects — is now being leveraged through an expanding set of international partnerships. The program is working with the CIF and the Energy+ partnership to develop innovations in results-based approaches for improving energy access and reducing greenhouse gas emissions. ESMAP is also participating in the UN's Sustainable Energy for All initiative, and is expected to play a key role in accelerating energy access pilot programs in support of the initiative's goal of universal access to modern energy services by 2030.



CHAPTER 4

HELPING DEVELOP THE NEXT GENERATION OF ENERGY EFFICIENCY

BOX 4

ESMAP ENERGY EFFICIENT CITIES INITIATIVE (EECI) ACHIEVEMENTS IN FY2011

- Informed World Bank lending operations by synthesizing best practices from implementation of public procurement of energy efficiency services, building energy efficiency codes from around the world, and dozens of new case studies on successful city energy efficiency policies and programs
- Provided operational support to a number of investment lending activities, such as low carbon city projects in Beijing and Shanghai focusing on transport and buildings, an urban development project in New Delhi targeting public buildings, and municipal building retrofit programs in Armenia and Macedonia
- Expanded analytical work into urban sectors with substantial potential for efficiency gains, including water and wastewater utilities, and public bus fleet operations and maintenance practices

FY2011: HIGHLIGHTS & ACHIEVEMENTS

Cities in the developing world lie at the heart of the contemporary energy challenge. Almost all urban population growth between 2010 and 2030 — 94 percent — is expected to come from developing country cities, which will account for 81 percent of urban energy growth during the same period. This rapid urbanization is creating heavy demands in terms of energy consumption and access, as well as increasing environmental impacts.

One of the primary responses to this challenge has been a concerted push for energy efficiency and campaigns to reduce energy intensity. For officials, there are clear benefits to increasing the efficiency of transport, buildings, and city services. These efforts help alleviate short-term energy supply constraints and improve access and affordability for the poor, while enhancing energy security and the long-term fiscal outlook.

However, developing countries face significant challenges as they try to scale up energy efficiency: a lack of supportive policies and institutions, the absence of tailored approaches to fit their needs, and limited access to financing.

The Energy Efficient Cities Initiative (EECI) was launched by ESMAP in October 2008 to address these needs. The initiative is designed to promote sustainable growth of cities by helping city planners and administrators make better-informed decisions, focusing on six key sectors — buildings, water, transport, public lighting, solid waste, and heating/power. EECI has so far informed and influenced US$700 million in World Bank financing.

PUBLIC PROCUREMENT

ESMAP published a guidebook on using public procurement schemes to support public facility renovations, building on the flagship report of 2010. The report stresses the importance of focusing on

the public sector, which is often the largest energy efficiency market in a country, and how energy waste can be reduced through incremental adjustments to budgeting and procurement procedures. Such savings can be substantial. The report estimates that up to 40 percent of the energy used in public office buildings could be saved if efficiency measures were incorporated, allowing budgetary savings to be used for other socioeconomic development needs.

The guidebook provides operational recommendations, specific procurement and financing options, and details on how to hire service providers to save energy in public facilities. This work has led to the development of the first World Bank procurement scheme for using energy savings performance contracts in a project in Armenia to renovate public service buildings, such as schools, kindergartens, orphanages, and hospitals. This guide was shared widely with World Bank regional and country teams, procurement staff, partners, and other multilateral and bilateral donors. As part of this work, an e-learning course on public procurement of energy efficiency services has been developed in conjunction with the World Bank Institute. The World Bank procurement department also held a seminar for procurement staff across the Bank to share these findings and recommendations.

BOX 4.1

IDENTIFYING ENERGY EFFICIENCY OPTIONS IN ASIAN CITIES

The Tool for Rapid Assessment of City Energy (TRACE) offers cities a quick and easy way to compare their energy use with peer cities, identify key sectors for improvement, and provide actions they can take. TRACE consists of two principal components: (i) a city energy benchmarking tool; and (ii) a decision tool to help rank actions from a "playbook" of tried and tested energy efficiency interventions. This unique ability to both assess the current situation and recommend actions for improvement fills a void in the suite of available tools.

TRACE prioritizes sectors with significant energy saving potential: urban transport, public buildings, public lighting, water and wastewater, power and heating, and solid waste. Recommendations in each priority sector are quantitatively and qualitatively evaluated based on key data, including energy savings potential and institutional requirements. Those recommendations carried forward are supported by implementation options, case studies, and references to tools and best practices.

TRACE was initially field-tested with positive results in Quezon City, Philippines. The tool has since been deployed in four other cities: Surabaya, Indonesia; Gaziantep, Turkey; Cebu, the Philippines; and Da Nang, Vietnam. The expansion of TRACE in Asia was conducted with the support of the Australian Agency for International Development (AusAID).

The tool has been very well received from city officials, helping them understand clearly how they compare to their peer cities, assess energy performance, prioritize under-performing sectors, and identify actions to be taken to lower their energy bills and save money. Recommendations have ranged from improved land use and transport planning and traffic demand management in Da Nang, to methane capture from landfills and wastewater in Cebu, to public procurement and lighting in Surabaya.

Demand for TRACE is growing quickly and is expected to be deployed in cities in Africa and Latin America in FY2012-13. As new cities use TRACE, additional city benchmark data will be added to the tool, as well as more case studies, making it even more effective in the years ahead.

HIGHLIGHTS OF NEW ESMAP-SUPPORTED ENERGY EFFICIENCY ACTIVITIES BY THE WORLD BANK'S REGIONAL UNITS

Egypt Energy Efficiency Strategy
In order to streamline energy efficiency efforts nationwide, Egypt in 2009 created an Energy Efficiency Unit, reporting to the Prime Minister's Office. This activity builds on the work supported by ESMAP to develop an institutional, regulatory, and implementation framework for promoting and implementing energy efficiency. The resulting recommendations are expected to help clarify the roles and responsibilities of various stakeholders so that the institutional structure for scaling up energy efficiency is clearly defined and better adapted to the needs of Egypt. Energy efficiency investment programs that could be implemented in the short- to medium-term will also be identified.

Lebanon: Support for Thermal Building Standards
The Government of Lebanon has adopted an action plan to increase the reliable availability of cost-effective electricity in the country. Buildings consume 40 percent of Lebanon's electricity but it has proven difficult to implement thermal building standards. This activity will review existing standards, identify barriers to implementation, provide advice on international best practices, and develop a roadmap for implementation of standards, as well as follow-up through training and awareness building.

Energy Efficiency Strategy for Industrial Enterprises in Uzbekistan
This work involves a comprehensive survey of manufacturing enterprises in Uzbekistan, including an analysis of structure, ownership, technologies, and energy consumption, to identify what barriers exist to scaling up energy efficiency in the industrial sector. This will be complemented with a review of existing legislation and regulations to assist Uzbekistan's Ministry of Economy to develop a strategy to systematically target energy efficiency savings in manufacturing.

Modernization of District Heating in Ukraine
While neighboring countries have upgraded district heating systems to make them financially sustainable, Ukraine has kept regulation, ownership, and operation of district heating companies in the hands of local governments, and kept tariffs well below the levels needed to provide good quality service. This study examines the obstacles that have kept district heating reforms from taking place. The objective is to help the Government of Ukraine draft a plan for reform, recognizing Ukraine's fiscal and social constraints.

Cairo Congestion Study
With a population of 17 million and rising, Cairo is one of the world's fastest-growing megacities. Traffic congestion is a serious problem in the metropolitan area, adversely affecting air quality, public health, business operations, and quality of life. This study will establish a baseline for traffic congestion in Cairo, with analysis of its causes and locations, as well as its associated cost. The second phase of the study involves prioritizing and recommending a package of specific fiscal, regulatory, and investment measures, such as congestion pricing schemes, vehicle inspection standards, public transport upgrades, and traffic management systems.

BUILDING CODES

Introducing energy efficiency into the building sector offers one of the greatest opportunities for reducing or avoiding greenhouse gas emissions currently available. However, energy efficiency building codes are often loosely and inconsistently enforced, and there is often a lack of support to improve enforcement from government and local industry.

The ESMAP report *Mainstreaming Building Energy Efficiency Codes in Developing Countries* surveys the extensive literature about implementing efficiency codes. It takes an in-depth look at the experience of four developing countries — China, Egypt, India, and Mexico — and one US state, California, to assess actual experience with code compliance and implementation, and identifies lessons for client countries. The report was presented at a meeting of the Asia Pacific Energy Research Center in Bangkok in September 2010, as part of an Asia Pacific Economic Cooperation (APEC) process among Asian countries to reduce the energy intensities of their economies.

DEVELOPING LOW CARBON CITIES

ESMAP continued to address the needs of its city clients in FY2011 through analytical work, knowledge dissemination, and technical assistance. TRACE was launched in 2010 and has since been deployed in five cities in Indonesia, Vietnam, the Philippines, and Turkey (see Box 3.1). The program also expanded its support to the World Bank's lending operations, including low carbon city projects in China and India focusing on transport and buildings. In Shanghai, ESMAP helped identify low-carbon transportation options and strategies, and provided technical assistance on international best practices in commercial building retrofits. In New Delhi, ESMAP supported a rapid market assessment for energy efficient retrofits to public buildings, as well as stakeholder consultations on program design and implementation strategies.

At the same time, ESMAP has expanded its analytical work into new areas with substantial potential for efficiency gains, such as water and sanitation, and public transport. Key "primers" on energy efficiency for municipal water and wastewater utilities, and on operations and maintenance practices for city bus fleets, have been developed and will be published in 2012.

FY2012–13: NEW CITIES, SECTORS, PARTNERSHIPS

One of the most important means to meet the UN Sustainable Energy for All goal of doubling of the rate of implementation of energy efficiency worldwide by 2030 is through actions at the city level, as cities will be the major drivers of energy demand and carbon emissions growth in the years to come. There are also strong linkages between increased efficiency and expanding access to modern energy services. For example, programs to improve the efficiency of lighting and appliances can also help to bring down the cost of access to electricity for urban poor populations.

To support these efforts, ESMAP plans to expand its work in energy efficiency, both geographically and in the sectors it covers.

EECI is working with the International Benchmarking Network for Water and Sanitation and the World Bank's Water and Sanitation Program on a new global report on efficiency in this sector, to be published in early 2012. ESMAP is also developing a new report on public procurement for energy-efficient products, which will inform governments on how to create sustainable purchasing programs and offer recommendations on how the World Bank can better ensure efficient equipment in its operational procurements.

ESMAP proposes to expand its outreach to cities to support their utilization of its analytical work and knowledge products, including TRACE, by fostering partnerships with municipal government associations, such as the C40 and ICLEI. It is envisaged that ESMAP could eventually deliver a complete program of services for cities and sub-national governments through such networks that would include technical support in energy assessments and low carbon development planning, training and capacity development, and preparation for financing.

BOX 4.2

REVIVING THE DISTRICT HEATING SYSTEM IN MOLDOVA

Temperatures in the capital city of Moldova, Chisinau, reach below -15°C in the winter. The city has depended on the municipal district heating company, Termocom, to meet essential heating needs for the capital's residents. However, heating tariffs were set below cost recovery in the past, which resulted in Termocom accumulating debt for heat purchased from combined heat-and-power plants and for natural gas suppliers. As a result, Termocom no longer had funds to maintain its system, leading to significant deterioration of infrastructure, and heat losses exceeding 22 percent.

By 2008, Moldova's arrears on natural gas reached 3.5 percent of GDP, leading to gas supplies from Russia to be cut off. The Government of Moldova approached the World Bank for technical assistance to address the crisis. This technical assistance, funded by ESMAP, resulted in a policy note in 2009 calling for the national and city governments to set prices to cost-recovery levels; consider a debt-to-equity swap for gas assets owned by the Government; and help citizens meet heating costs by establishing a targeted social safety net. A subsequent ESMAP activity provided detailed recommendations to the government to address the long-term debt of Termocom through corporate and financial restructuring.

Following these recommendations, the tariff setting responsibilities were transferred to a national agency and heat tariffs were increased to cost-recovery levels. The successful implementation of the restructuring has put the municipal district heating system on a financially sustainable path, designed to ensure continued supply of heating for the residents of Chisinau. These reforms have also created a more positive environment for the private sector to finance cost-effective energy efficiency investments. These investments are expected to reduce the cost of heat and improve access for the city's poor.

CHAPTER 5

DEVELOPING EFFECTIVE ENERGY SECTOR POLICIES, PRACTICES, AND INSTITUTIONS

BOX 5

HIGHLIGHTS OF ESMAP WORK IN FY2011 UNDER THE ENERGY ASSESSMENTS AND STRATEGY PROGRAM

- Carried out assessments of the impact of the global financial crisis on the power sectors in South Asia and low-income countries in Europe and Central Asia, with specific recommendations for policy actions
- Supported a systematic review of India's power sector, covering service delivery, private sector participation, policy implementation, as well as operational and financial performance
- With the League of Arab States, launched work towards a Master Plan for the development of electricity trade among Arab countries
- Published a comprehensive study of international experiences in electricity auctions, focusing on how developing countries can procure long-term contracts for new generation capacity

FY2011: HIGHLIGHTS & ACHIEVEMENTS

The **Energy Assessments and Strategies Program** (EASP) has formed the core of ESMAP's engagement with clients since ESMAP's establishment. The work performed under EASP has immediately applicable implications for the energy sector of client countries and has had a measurable impact on World Bank lending. A review of the ESMAP portfolio completed in February 2011 estimated that upstream EASP activities in FY2008 through FY2010 informed World Bank lending operations worth a total of US$6.8 billion.

Energy assessments help countries take stock of their resource endowments, review the strengths and weaknesses of national policies and market structures, build capacity for improved sector performance and governance, and develop and enhance energy sector institutions. A key objective is to distill best policies and practices from around the world and adapt them for specific national and regional contexts, as well as for practical toolkits which can be used globally.

MITIGATING ENERGY VULNERABILITIES IN A VOLATILE WORLD

A core role for ESMAP in recent years has been working with clients to identify vulnerabilities in their power sectors and to help map out courses of action to mitigate these threats. These vulnerability assessments encompass work on volatile fuel prices, financial crises, and climate change.

One of the highest profile of these assessments was a survey completed in FY2011 of the impact of the 2008-09 global credit crisis on the power sector in South Asia. The study found that while the region had managed to weather the financial storm, large-scale investment was still needed to meet the growing electricity demand (see Box 5.1).

BOX 5.1

ASSESSING THE IMPACT OF THE FINANCIAL CRISIS ON SOUTH ASIA'S POWER SECTOR

The recent global financial crisis had a relatively moderate impact on the flow of funds to South Asia's power sector, according to an ESMAP study released in September 2010. However, the region still needs up to US$150 billion in investment by 2015 to meet a rapidly growing demand for electricity.

The region was cushioned from the crisis in large part because of its limited integration with global financial markets, according to the report *Impact of the Global Financial Crisis on Investments in South Asia's Electric Power Infrastructure*, which covered India, Pakistan, and Bangladesh.

Most of the financing for the power sector during this period came from domestic commercial banks in India, multilateral lending institutions in Pakistan, and government budget allocations in Bangladesh. Strong and timely policy interventions also helped minimize impacts. However, the report noted that the power sectors in these countries still face important challenges, including financial losses at the utility and distribution level, and the implementation of short-term and expensive solutions to meet the supply-demand gap.

To accelerate the modernization of the power sector and to increase its resilience as the region integrates with the global economy, the study recommended the rationalization of tariffs, transparent administration of subsidies, enhancing the efficiency and commercial viability of distribution entities, and removing impediments to ensure speedy implementation of generation projects.

The findings of the study were disseminated at events in New Delhi and Dhaka, and the report received substantial policy and media attention in the three countries.

The situation was quite different for low-income countries in the Europe and Central Asia region. The global financial crisis hit that region harder than any other, and in countries such as Ukraine and the Kyrgyz Republic, industrial production plummeted. As a result, according to an FY2011 ESMAP assessment, electricity demand dropped and governments postponed tariff increases, compounding an already bleak financial and investment landscape for the power sector. In the case of the Kyrgyz Republic, this resulted in a severe winter energy shortage because of insufficient baseload capacity. The report recommended urgent power plant rehabilitation and efficiency measures to increase generation and a series of emergency policy actions to strengthen the financial performance of the power sector.

INSTITUTIONS, GOVERNANCE, AND MARKET STRUCTURES

Complementing the vulnerability assessments is ESMAP's longstanding work on strategy and governance: helping countries develop the **institutions, policies, and market structures** needed for an effective energy sector.

A June 2011 World Bank paper, *Revisiting Policy Options on the Market Structure in the Power Sector,* jointly supported by ESMAP and the Public-Private Infrastructure Advisory Facility reviewed the structure of power markets around the world. It compared market structures based on four performance indicators: operational efficiency, financial efficiency, environmental sustainability, and residential access to electricity.

HIGHLIGHTS OF NEW ESMAP-SUPPORTED ENERGY ASSESSMENTS AND STRATEGIES ACTIVITIES BY THE WORLD BANK'S REGIONAL UNITS

The India Power Sector: A Stocktaking and Directions for the Future

This comprehensive review looks at the Indian power sector from a number of perspectives: access and affordability of services; private sector participation; implementation of policy, institutional and regulatory reforms; and operational and financial performance. Data from all (more than 100) utilities in the country will be combined with information from focus groups and informant interviews. The goals include identifying Indian states with successful power sectors and learning from their experience, and building a knowledge base that can support the World Bank's operational engagement with the Indian power sector going forward.

Assessment of Institutional and Regulatory Framework for Electricity Trade in the Arab World

Conducted in partnership with the League of Arab States, the objective of this work is to establish a strategy and master plan for the development of electricity trade among Arab countries. The study will look at the legal and regulatory framework governing the power sectors and attempts to identify barriers to efficient energy trading and the development of a better integrated regional energy market. It will assess the general terms under which electricity could be traded and proposes an action plan for negotiation of treaties and agreements. The study will lay out a path towards market integration in four stages: (i) implementation of a transitional market design, (ii) focus on unbundling and introducing competition, (iii) moving toward a comprehensive market design, and (iv) achieving a fully integrated market and interconnected electricity network.

Nepal: Support to Strategic Energy Sector Development

Despite having substantial energy generation potential, Nepal has extremely low access to electricity and suffers from disruptive power cuts sometimes lasting up to 16 hours a day. The country is expanding its power sector investments to include cross-border energy trade with India with support from the World Bank. This activity focuses on developing capacity in areas that are central to energy sector development in Nepal but that are not being addressed by other donors. This includes workshops on the Indian power market and Indian regulation, helping to develop cross-border electricity trade strategies, and training on procurement mechanisms. This activity also supports the Nepal Electricity Authority in its roll-out of a Demand-Side Management program.

Developing a Regulatory Framework for the Maldives' Energy Sector

The Maldives relies heavily on imported fuel to meet its energy needs, leading to an adverse impact on its trade and balance of payments. This activity is designed to help the government to develop and implement a sustainable regulatory regime for the energy sector, in support of the country's goals of reducing dependence on diesel-powered electricity and moving towards carbon neutrality. The work involves an assessment of current policies and legislation, an analysis of alternative regulatory options along with recommendations, and design of workable regulatory framework of the preferred option.

Armenia: Study of Demand-Side Management Tools

This work supports the Public Services Regulatory Commission of Armenia to implement regulatory measures to reduce overall energy use by assessing the feasibility of using Demand-Side Management tools in the country. This work includes analyses of the structure of electricity and gas demand for various groups of customers. The study will recommend load management tools to influence the size and the timing of demand for electricity and gas for various categories of end-users, based on detailed cost-benefit analysis, the analysis of the demand for electricity and gas, and international best practices.

A particular focus was whether "vertical unbundling" — disaggregating electricity services into component parts, such as generation, transmission, and distribution — was beneficial for developing countries. The report concluded that unbundling was not always appropriate — especially for small countries with low per capita income — and that unbundling delivered the best results when used as an entry point to implement broader reforms.

For many developing countries, the challenge of meeting electricity demand is not only an issue of market structure, but of cost-effective procurement of generation. The situation is particularly difficult in countries with volatile load growth rates and limited access to financing. *Electricity Auctions: An Overview of Efficient Practices*, published in mid-2011, takes a comprehensive look at international experiences in **electricity auctions**, focusing on how developing countries can procure long-term contracts to foster new generation capacity. Auctions have gained wide interest in recent years due to their ability to attract both local and international power producers, and the chance to obtain contracts that draw on multiple technologies and sources of generation.

Regional power integration is another option for many countries as they try to more efficiently meet demand and utilize their energy resources. Regional integration has often been difficult to achieve in the past, due to divergences in national regulatory environments, investment capacities and development goals. Interest in integration schemes has only continued to grow, however, due to their clear advantages in terms of investment and operating cost savings and greater energy security. ESMAP's Regional Energy Integration Strategies Program (REISP) drew in-depth policy lessons from a wide range of bilateral and multilateral energy markets and regulatory regimes.

While REISP was satisfactorily completed in FY2010, those efforts continue to inform and direct ESMAP-supported work underway by the World Bank's regional units on power integration. In the Middle East and North Africa, a study has been completed on the institutional and regulatory aspects of a regional electricity market for 22 Arab countries (see section on ESMAP-supported regional activities). In Latin America, ESMAP supported studies on electricity demand and generation, and on regional power integration in FY2011. They concluded that electricity demand in the region is expected to double in the next 20 years, and lays out options for the power sector, including reform of regulatory and licensing processes, expansion of non-hydropower renewables, and greater regional electricity trading.

FY2012–13: ELECTRICITY POLICY AND TECHNOLOGY OPTIONS

Selection of appropriate electricity technology is critical for designing new power projects and associated transmission and distribution facilities. These choices are increasingly complex, however, due to fast-paced technological change, rapid shifts in equipment and fuel prices, and climate change imperatives. In FY2012, EASP will complete a flagship activity, **Electricity Technology Options Assessment Guide**, which is intended to help planners select between competing electricity technology options.

The primary objective of this global knowledge product is to develop a user-modifiable, internet-based spreadsheet model for the comparative assessment of economic (levelized) costs of all generation options, including renewable energy. The model will also cover transmission and distribution technologies, and take major environmental externalities into account. Full-scale, site-specific assessments will be carried out for data from India, the United States, and Romania to demonstrate application of the model in real world cases.

The assessment model will be posted on the ESMAP website and will be updated over two more years based on global user feedback.

ESMAP is also looking more closely at an area of critical interest to its clients: the substantial financing gap for transmission and distribution systems created by the strains of rapidly growing economies. A study being carried out in FY2012 looks specifically at different modalities of private sector participation in power grids, and the design and implementation challenges of open access to transmission and distribution to foster competition and increase efficiency. This work will be used to advise World Bank staff and clients on options for private sector participation and open access, drawing on lessons gained from international experience while taking into account specific country conditions.

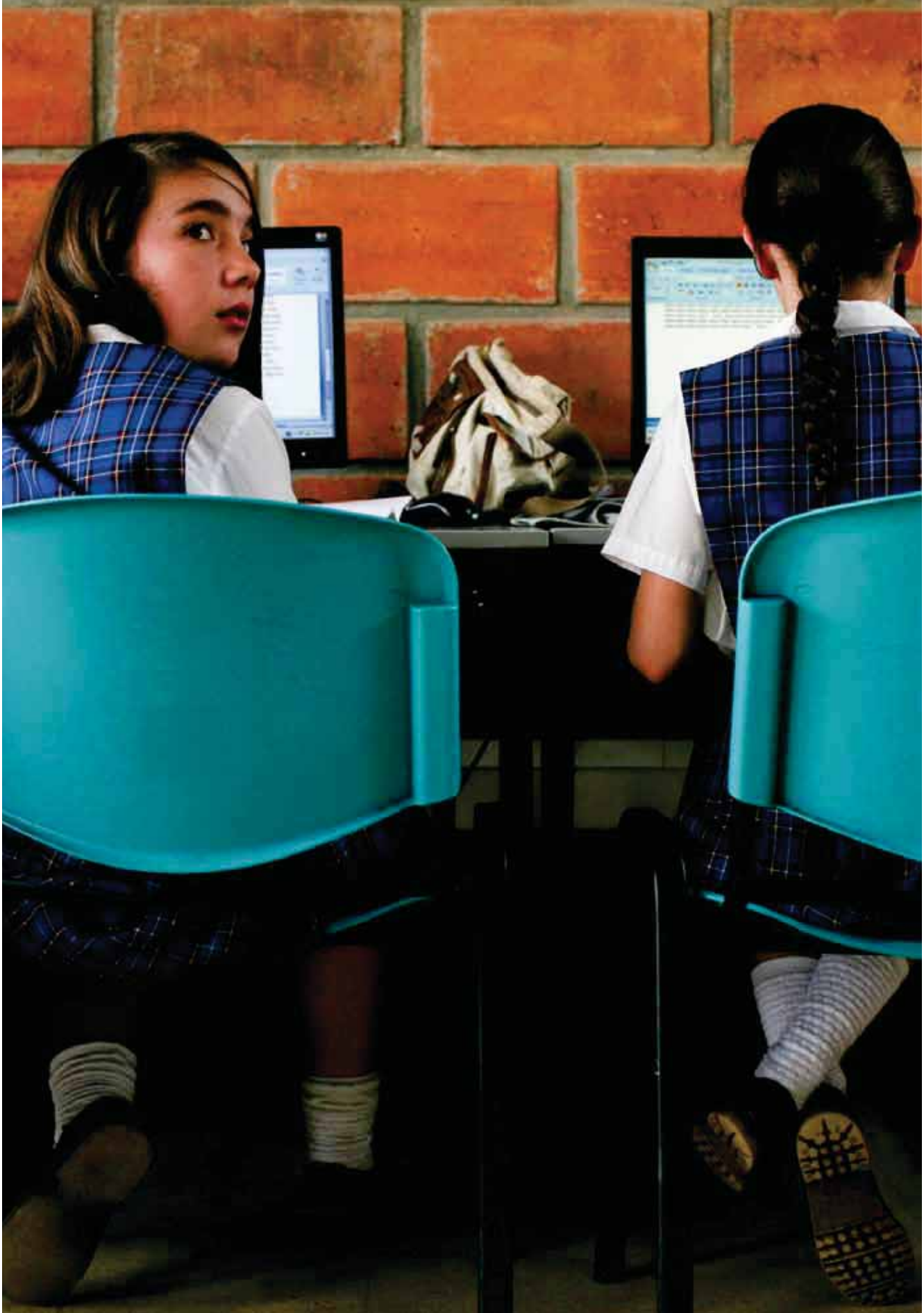
BOX 5.2

CAN NATIONAL OIL COMPANIES CREATE "SOCIAL VALUE" FOR DEVELOPING COUNTRIES?

As part of its work on energy sector governance and market structure, ESMAP sponsored a study on a critical but understudied element of the energy sector environment: national oil companies (NOCs). NOCs control approximately 90 percent of the world's oil reserves and 75 percent of production. However, research until recently has not focused on these institutions, other than to point out the efficiency gaps in labor and capital between NOCs and private companies. The resulting report, *National Oil Companies and Value Creation*, fills this gap by assessing whether NOCs create "social value" — benefits for society that go beyond the financial return of investment from exploitation of resources.

The study carried out a statistical analysis on data from 20 countries to learn what drives value creation. Detailed research was conducted on 12 NOCs. Among the conclusions were that internal government mechanisms were more critical to success than ownership structure, and that the pursuit of national mission objectives did not necessarily hamper the creation of "social value" by NOCs. It was also pointed out that NOCs in countries with large resource endowments often found it more difficult to create value than their counterparts in countries with more limited endowments.

The study has generated interest from a number of countries. Inquiries about the report have come from government officials and practitioners in countries that are in the process of reforming their energy sector, including Uganda, Mexico, Timor Leste, and the Democratic Republic of Congo.



CHAPTER 6

FINANCIAL REVIEW

BOX 6

CONTRIBUTIONS RECEIVED

ESMAP received a total of US$22 million from donors in FY2011. Total receipts for FY2011 include the contribution for the AFREA program from the Government of the Netherlands (US$11.2 million).

Seven donors, in addition to the World Bank, made cash transfers to the program through trust funds. ESMAP received support from a new donor country, Lithuania, which signed into the new ESMAP Core Multi-Donor Trust Fund.

Table 6.1 shows actual receipts from individual donor for the period FY2009–11 and receipts and pledges for FY2012.

Table 6.1: ESMAP Funding FY2009–11 and Receipts/Pledges FY2012 (US$ Thousands)

				2012		Total Receipts	
Country	**2009**	**2010**	**2011**	**Receipts**	**Pledges**	**09–11**	**%**
Australia	–	453	1,067	3,030		1,520	2.2%
Austria	588	424	2,680		–	3,692	5.3%
Canada	396	100	–		–	496	0.7%
Denmark	1,762	1,849	3,913	7,093	2,087	7,524	10.8%
Finland	–	741	–			741	1.1%
France	885	–	–		646	885	1.3%
Germany	4,801	2,185	1,993		1,292	8,979	12.9%
Iceland	300	200		356	–	500	0.7%
Lithuania	–	–	27		–	27	0.0%
Netherlands	23,890	–	11,286	2,900	2,900	35,176	50.7%
Norway	750	750	839	853		2,339	3.4%
Sweden	–	–	–	1,569	741	–	0.0%
United Kingdom	4,615	1,961	–		–	6,575	9.5%
World Bank	280	437	272		300	989	1.4%
Grand Total	**38,268**	**9,100**	**22,077**	**15,801**	**7,966**	**69,444**	**100%**

Notes:
Actual receipts for FY2009 and FY2011 from the Netherlands and the United Kingdom include contributions made to ESMAP's Multi-Donor Trust Fund (MDTF) for the Clean Energy Investment Framework (CEIF), which includes the AFREA Program.

DISBURSEMENTS

Disbursements in FY2011 totaled US$18.2 million, a decrease of US$2.35 million over disbursements in FY2010. The decrease in disbursements was the result of phasing out ESMAP's previous core multi-donor trust fund, plus two other thematically restricted trust funds and phasing in a single multi-donor trust fund, as well as substantial one-off disbursements in FY2010 under a special program, the Low Carbon Growth Country Studies, funded by the UK's Department for International Development.

Table 6.2: ESMAP Disbursements, FY2009–11 (US$)

	FY09		FY10		FY11	
Project Cost	**$18,630.20**	**93%**	**$18,569.26**	**90%**	**$16,211.90**	**89%**
Africa	$3,176.14		$4,045.70		$6,317.98	
East Asia	$1,408.04		$1,365.88		$934.69	
Europe & Central Asia	$780.38		$1,350.60		$537.59	
Latin America & Carribean	$2,793.76		$2,082.50		$1,278.87	
Middle East & North Africa	$1,718.66		$1,227.06		$1,020.48	
South Asia	$1,183.13		$1,946.30		$726.00	
ESMAP Global Programs	$7,570.09		$6,551.23		$5,396.28	
Program Management & Administration*	$1,495.84	7%	$2,036.90	10%	$2,040.18	11%
Total	**$20,126.04**	**100%**	**$20,606.16**	**100%**	**$18,252.08**	**100%**
Of which:						
Funded by Donors	$19,414.09		$19,629.16		$17,388.56	
Funded from World Bank budget	$283.45		$437.00		$272.72	
Funded from Fee Income	$428.50		$540.00		$590.80	

* Includes M&E, Communications, and governance.

Notes:

- ESMAP global programs cover global analytical and advisory activities and include activities managed by the ESMAP core team, as well as activities managed by the Sustainable Energy Department, the Environment Department, and other units of the World Bank's Sustainable Development Network.
- Disbursements to the World Bank's regional units in FY2009-11 include ABGs through the ESMAP MDTF and disbursements from the CEIF MDTF, which includes the AFREA program as well as grants for low carbon development, climate change mitigation, and climate change adaptation activities.
- The increase in disbursement in the Africa region is from the AFREA program — notably under recipient-executed activities: Disbursements for recipient-executed activities were FY2009: US$0.18 million, FY2010: US$ 0.12 million, and FY2011: US$2.95 million.
- The only recipient-executed activities under the ESMAP portfolio in FY2009-11 took place as part of the AFREA program.

BREAKDOWN BY PROGRAM AREA

The following table shows total ESMAP spending for FY2011 by program area:

- Energy Assessments and Strategy Program
- Energy Efficient Cities Initiative
- Energy Access
- Clean Energy

Table 6.3: ESMAP Disbursements By Program Area, FY2011 (US$)

	AFR		EAP	ECA	LCR	MNA	SAR	ESMAP Global Programs	TOTAL
	non-AFREA	AFREA							
EASP	87,692		588,642	387,738	611,626	262,655	397,129	2,804,124	**5,139,605**
EECI								1,124,854	**1,124,854**
Energy Access	118,288	6,112,002	150,784		64,004			673,587	**7,118,665**
Clean Energy			195,269	149,851	603,240	757,828	328,874	793,713	**2,828,775**
	205,980	6,112,002							
TOTAL		6,317,982	934,695	537,589	1,278,870	1,020,483	726,003	5,396,278	**16,211,899**

World Bank Regions | **AFR** – Africa | **EAP** – East Asia and Pacific | **ECA** – Europe and Central Asia | **MNA** – Middle East and North Africa | **LCR** – Latin American and the Caribbean | **SAR** – South Asia

Notes:

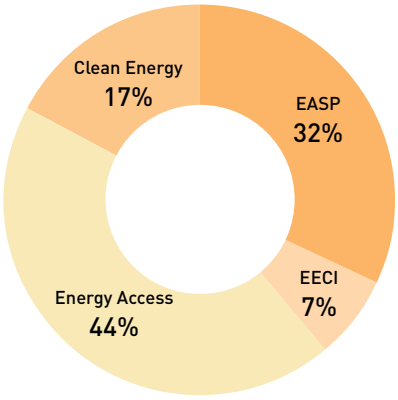
- The EASP category includes renewable energy, energy efficiency, and low carbon development activities as part of energy sector assessments and strategy work.

- Of the funding for the World Bank's regional units in FY2011:
  - 39% came through the ABG process under the ESMAP MDTF
  - 57% came as funding for the AFREA program under the CEIF MDTF
  - 4% came through the CEIF MDTF for low carbon development and climate change mitigation and adaptation activities

- ESMAP global programs cover global analytical and advisory activities and include activities managed by the ESMAP core team, as well as activities managed by the Sustainable Energy Department, the Environment Department, and other units of the World Bank's Sustainable Development Network.

Figures 6.1 and 6.2 display the division of ESMAP spending by program area in FY2011, for the entire program and for ESMAP own-managed activities, respectively.

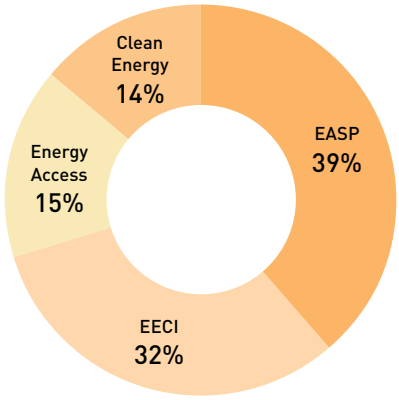
Figure 6.1: ESMAP Spending By Program Area, FY2011, Entire Program



Notes:

- The EASP category also includes renewable energy, energy efficiency, and low carbon development activities as part of energy sector assessments and strategy work.
- The Energy Access category includes monies spent under the AFREA program.

Figure 6.2: ESMAP Spending By Program Area, FY2011, ESMAP Own-Managed Activities Only



Note:

- The EASP category also includes renewable energy, energy efficiency, and low carbon development activities as part of energy sector assessments and strategy work.

PROGRAM MANAGEMENT SPENDING

Table 6.4 gives a breakdown for ESMAP program management and administration. These funds support the core ESMAP program itself, and are not distributed to the World Bank's regional units.

Table 6.4: ESMAP Program Management and Administration Costs, FY2011 Only (US$ Thousands)

Program Management	Administration Cost
Governance (CG, TAG)	69,758
Portfolio Management (M&E)	253,659
Communication and Outreach (Publications, Website, and Other Dissemination)	425,979
Knowledge Forums	48,431
Program Management	988,437
Resource Management/Trust Fund Administration	253,915
Total	**2,040,179**

ANNEX I

PROCEEDINGS OF CG MEETING, 2011

CONSULTATIVE GROUP MEETING FOR ENERGY TRUST FUNDED PROGRAMS | ESMAP, AFREA, AND ASTAE

18 March 2011, Washington DC
(updated 7 April 2011)

Draft Minutes.

1. The Consultative Group (CG) meeting for the World Bank-managed Energy Trust Funded Programs was held in Washington, DC on March 18, 2011. The meeting was chaired by Mr. Hartwig Schafer, Director of Strategy and Operations in the Bank's Sustainable Development Network.

2. The CG meeting comprised of eight sessions: (i) an opening session; (ii) Report on ASTAE and new Business Plan for FY12-15; (iii) Technical Advisory Group (TAG) report to the CG; (iv) update on ESMAP's Monitoring and Evaluation (M&E) Framework; (v) ESMAP's Work Program and Annual Budget for FY2012-13; (vi) Report on the Africa Renewable Energy Access Program (AFREA); (vii) Terms of Reference (TOR) for the External Evaluation of ESMAP; and, (viii) a closed session.

3. As requested by CG members at their 2010 meeting, these proceedings document the main agreements and/or conclusions for each of the open sessions. For more details

regarding each topic, please refer to the CG workspace for all relevant documents (www.esmap.org/cg).

4. The following represents a summary of the meeting's proceedings.

Opening Session

5. The Chair welcomed CG members and made introductory remarks to highlight ESMAP's achievements over the past year. The Chair thanked CG members for their generous support to ESMAP and welcomed Lithuania as a new donor to ESMAP, as well as several other countries, which joined the meeting as observers.

ASTAE (Asia Sustainable and Alternative Energy Program)

6. Participants agreed on the effectiveness of ASTAE in promoting sustainable energy in Asia and Pacific regions, and agreed that there is an urgent need for new funding. These views were validated by the TAG assessment report that recognized ASTAE's potential contributions to low carbon, green growth, energy access, regional cooperation, and cross sectoral [issues] such as urban energy in the fast growing countries of Asia.

7. An outline of the proposed business plan, which recognizes the need to accommodate increased interest from the South Asia region, was presented at the meeting. Representatives from the Netherlands, Sweden, and the United Kingdom expressed interest in the ideas presented, and were requested to confirm their respective governmental commitments as soon as possible.

TAG Report to the CG

8. The TAG highlighted their assessment of the approach and directions taken by ESMAP, as detailed in their report to the CG:
   - The TAG commended ESMAP for taking a cross-sectoral approach by including the urban and water sectors in its program, noting that the emerging global challenges required integrated solutions. The TAG also noted achievements in ESMAP's efforts to implement the M&E system, adopt quality assurance guidelines, foster partnerships with other programs and agencies, bring in new and potential donors, and create stronger teams and work programs in energy access and clean energy.
   - TAG also noted that ESMAP is initiating interesting and novel external partnerships, and advised that ESMAP continue to develop such partnerships, particularly those of a cross-sectoral nature.
   - As areas requiring more attention, the TAG highlighted the need for: (i) a clear communications strategy, particularly for ESMAP's knowledge products; (ii) the simplification of program names and structure; and (iii) client perspectives in the governance of the energy trust funded programs.
   - The TAG also advised the CG on the importance of timely payment of pledged funding to ESMAP and continuing to channel funds through the core Multi-Donor Trust Fund established in 2009, in order to ensure the effective implementation of the Strategic Business Plan.
   - The TAG welcomed the proposal to implement a phase two of AFREA (AFREA II) as an ESMAP special initiative for Africa, with the program team leader located in the Africa Energy Unit, but the program being part of the ESMAP trust fund.

9. In response to the TAG's observations regarding ESMAP's communication strategy, Mr. Rohit Khanna, ESMAP Program Manager, informed the CG that the recruitment of a Communication Officer is currently underway, specifically to address the need for a more comprehensive and coordinated communications and knowledge dissemination

strategy. He also suggested that there be more regular and frequent communication and interaction between the TAG and the ESMAP team.

10. The discussion then focused on the mix of ESMAP's client countries and thematic areas. Some CG members stressed the need for ESMAP to ensure that low-income countries are the main recipients of ESMAP support and to increase its activities that focus on promoting renewable energy. Others noted that ESMAP's operations in middle-income countries serve an important function, not only in supporting these governments to be "first movers" in renewable energy and energy efficiency practices, but, equally important, in providing cross-learning opportunities for low-income countries. In this context, there is a need to mobilize additional resources to launch AFREA II and place more emphasis in low-income countries without cutting back on middle-income countries (however, several CG members stated that countries excluded from the OECD-DAC list of Official Development Assistance countries should no longer receive ESMAP support).

ESMAP's M&E Framework | Program Manager's Report

11. Mr. Khanna updated the CG on ESMAP's M&E activities and plans to further improve the implementation of the M&E framework. He noted that ESMAP will invest resources and management attention to measuring the performance of its programs. Accountability for outputs and outcomes will be critical elements of ESMAP's M&E processes. This means more consistent reporting on the baseline and target values, more robust indicators, and more results-oriented programming. Mr. Khanna indicated that the portfolio review, which will be carried out annually, is a first step in accounting for how ESMAP's activities have achieved results in terms of its goal and purpose.

12. Mr. Khanna also elaborated on two other issues raised by CG members:
    - Alignment of ESMAP's indicators with the indicators on the World Bank's Energy Strategy | Mr. Khanna agreed that ESMAP's indicators will need to align with the indicators adopted in the World Bank's Energy Strategy as relevant.

    - Clarification on the categories of those ESMAP activities that have not demonstrated results | Mr. Khanna indicated three categories as follows: (i) weak indicators, baseline information or target values that make it difficult to assess results; (ii) generally uncertain outcomes of ESMAP-managed country level work (as distinct from those implemented by the World Bank's regional operations units); and (iii) activities that have been recently completed and in which it is too early to determine impacts.

13. The CG welcomed the preliminary set of portfolio reviews, particularly the strong focus on results, and encouraged ESMAP to develop reports that communicate the higher level outcomes effectively to senior officials in donor agencies.

ESMAP's Work Program and Annual Budget | Program Manager's Report

14. Mr. Khanna presented his update on ESMAP's business plan and work program for FY12, highlighting the following:
    - ESMAP's continued focus will be on research and analysis that influences the strategic directions of the energy sector. The program should help shape the future by generating new knowledge; drawing on lessons learned across regions and sectors; helping apply these lessons in the design of new energy policies, institutions, and programs; anticipating opportunities and challenges; and promoting innovation.

    - Strengthening ESMAP's overall effectiveness (operational leveraging, knowledge

clearinghouse, and think tank function) by replicating the business model used under the Energy Efficient Cities Initiative (EECI) to other program teams. A new Clean Energy team—combining the activities of the Renewable Energy Market Transformation Initiative, Climate Change, and energy technologies—will be established.

- Placing greater emphasis on Africa through AFREA II within ESMAP's Multi-Donor Trust Fund.

- Supporting a new initiative for the Small Island Developing States (SIDS), in the areas of renewable energy and energy efficiency.

- Strengthening the Annual Block Grants through performance-based allocations to the Bank's regions and the use of incentives for client engagement in cross-cutting activities (urban, transport, forestry), new areas (climate change mitigation and adaptation), and household energy.

- Creating new partnerships with the Global Partnership on Output-Based Aid, Public-Private Infrastructure Advisory Facility, and Climate and Development Knowledge Network to leverage additional resources.

15. The CG observed that there is a clear vision at ESMAP for moving forward and appreciated the integrated approach proposed for ESMAP's teams. The CG also indicated that ESMAP's think tank function gave it a comparative advantage in looking ahead, "thinking outside the box," and helping to shape the future. CG members welcomed the SIDS program and called on ESMAP to foster collaboration with the International Renewable Energy Agency's work with these countries. CG members endorsed the greater emphasis on energy access in ESMAP's work program and, in this context, requested ESMAP to play a proactive role in events and activities related to the International Year for Sustainable Energy for All. The CG acknowledged the importance of ESMAP's work in promoting energy efficient cities, given global urbanization trends. CG members indicated that planning and analytical tools developed by the Covenant of Mayors in Europe could be usefully transferred to ESMAP client countries.

Report on AFREA

16. Mr. Vijay Iyer, Sector Manager, Africa Energy Unit of the World Bank (AFTEG), made a presentation on the status of the AFREA program to the CG, highlighting the major energy challenges faced by Africa and noting critical emerging opportunities for governments, donors, and regional organizations to address energy issues. Mr. Iyer presented the three energy objectives for Africa: reducing energy poverty, developing energy for green growth, and making biomass energy sustainable.
17. Ms. Dana Rysankova, AFREA Program Coordinator, outlined the rationale for continued support for AFREA and the scope of proposed activities in AFREA II.

18. The CG agreed that it was important to build on what has been achieved with the generous support of the Government of the Netherlands. The CG supported integrating AFREA II into the core ESMAP trust fund and work program, and noted that this would effectively link global and regional renewable energy access activities. The CG requested that the M&E framework for AFREA II should be aligned with that of the overall ESMAP program. CG members cautioned that there are a number concurrent activities related to improved cook stoves. Mr. Khanna acknowledged the importance of knowledge exchange and coordination among all implementing groups, and noted that the Global Alliance on Clean Cook Stoves (which ESMAP has joined) was established for this purpose. CG members also pointed to a number of international and regional initiatives with whom AFREA could partner, such as the Regional Center for Renewable

Energy and Energy Efficient (ECREEE), Africa-EU partnership, and Dutch-German partnership Energizing Development (EnDev).

TOR for External Evaluation of ESMAP

19. The suggestions and conclusions on the draft TOR for the external evaluation of ESMAP are as follows:
    - The CG suggested including gender and social aspects, as well as participation of beneficiaries, in evaluating ESMAP activities.
    - In order to accommodate a more thorough review and discussion of the TOR, it was agreed that the period for written comments on the draft TOR would be extended by three weeks, to Friday, April 8, 2011.
    - It was also agreed that the current CG workspace will be maintained as a common web-space where CG members are able to share their comments on the TOR with each other.
    - CG members are invited to participate in the selection of consultants, by indicating their interest to ESMAP, also by April 8, 2011. It is envisaged that up to two members of the CG would be involved in the process, which will follow the Bank's procurement policies and guidelines for international competitive bidding.

Closed Session

20. The closed session was chaired by Mr. Schafer and attended by principals of the CG, the ESMAP Program Manager, and AFREA staff. Separate minutes have been prepared for this session.

ANNEX II

STATUS OF PROGRAM OUTPUTS, FY2009–11

The following tables summarize the status of outputs and deliverables under each of the ESMAP programs and initiatives according to the M&E system introduced in 2010. This listing of outputs and deliverables is extracted from the logical framework matrices developed under the M&E system[2]. For each output, a planned value is given and compared with an actual achieved value for each indicator across the three fiscal years: 2009, 2010 and 2011.

World Bank Regions
AFR – Africa
EAP – East Asia and Pacific
ECA – Europe and Central Asia
MNA – Middle East and North Africa
LCR – Latin American and the Caribbean
SAR – South Asia

2 Development outcomes and observed results in connection with the delivery of these outputs are presented in detail in *ESMAP Portfolio Review FY2009–11* (Feb 2011). Please visit www.esmap.org for details.

PROGRAM COMPONENT 1 | ENERGY ASSESSMENTS AND STRATEGY PROGRAMS (EASP)

Program 1A | Country Energy Sector Vulnerability Assessments (CESVA)		
Objective | To assist ESMAP client countries to reduce energy sector vulnerability to interlinked global crises. CESVA is a large-scale vulnerability initiative aimed at identifying existing and emerging vulnerabilities, focusing on the impact of the global financial crisis, fuel price and climate change on the energy sector of developing economies.		
Output 1 | Carry out Power Sector Vulnerability Assessments (PSVAs) in client countries to estimate short- to medium-term impacts of the credit crisis on the power sector and to inform potential strategic response from the World Bank		
■ Indicator | Number of PSVAs carried out in client countries		
2009	Planned | 3	Actual | 3 ■ Country Energy Sector Vulnerability Assessment: Assessing the Impact of Recent Credit Constraints on Power Sector Investment Requirements in Indonesia, Philippines and Vietnam
2010	Planned | 14	Actual | 10 ■ Country Energy Sector Vulnerability Assessment: Assessing the Impact of Recent Credit Constraints on Power Sector Investment Requirements in Egypt, Jordan, Morocco and Tunisia (MNA) ■ Country Energy Sector Vulnerability Assessment: Assessing the Impact of Recent Credit Constraints on Power Sector Investment Requirements in Colombia, Jamaica, Peru (LCR) ■ Country Energy Sector Vulnerability Assessment: Assessing the Impact of Recent Credit Constraints on Power Sector Investment Requirements in India, Pakistan, Bangladesh (SAR)
2011	Planned | 4	Actual | 5 ■ Country Energy Sector Vulnerability Assessment, "Financial Crisis: Threat or Opportunity for Power Sector in ECA Countries" - Armenia, Kyrgyz Republic, Romania, Serbia and Ukraine (ECA)
Output 2 | Carry out Oil Price Vulnerability Assessments (OPVAs) in selected regions to examine measures of oil price volatility and evaluate policy instruments to cope with oil price volatility		
■ Indicator | Number of OPVAs carried out in client countries		
2009	Planned | 0	Actual | n/a
2010	Planned | 1	Actual | 0
2011	Planned | OPVA for Central America and the Caribbean Region	Actual | 0 ■ The OPVA for Central America and Caribbean region ("Managing High & Volatile Oil Prices: Central America and the Caribbean") is currently in the final stages and delivery to client and dissemination will occur in third quarter FY2012.
Output 3 | Carry out Climate Vulnerability Assessments (CVAs) in the Europe and Central Asia Region to develop a framework for decision-making to support adaptation of energy infrastructure to climate change; develop a toolkit documenting the approach and methodology of pilot assessments		
■ Indicator | Number of CVAs carried out in ECA		
2009	Planned | 0	Actual | n/a
2010	Planned | 2	Actual | 1 ■ Albania Climate Vulnerability Assessment: An Assessment of Climate Change Vulnerability, Risk, and Adaptation in Albania's Power Sector
2011	Planned | 0	Actual | 0 NOTE | The Uzbekistan Climate Vulnerability Assessment is in final stages and delivery to client and dissemination will occur during third quarter FY2012.

■ Indicator | Number of toolkits developed		
2009	Planned | 0	Actual | n/a
2010	Planned | 1	Actual | 1 ■ Hands-on Energy Adaptation Toolkit (HEAT) developed, launched and disseminated
2011	Planned | 0	Actual | n/a
■ Indicator | Conduct AAA/TA in support of the joint task force between ESMAP and the Global Expert Team for Adaptation		
2009	Planned | 0	Actual | n/a
2010	Planned | 1	Actual | 0
2011	Planned | 0	Actual | 1 ■ Report "Climate Impacts on Energy Systems" delivered and published

Program 1B | The Regional Energy Integration Strategies program was satisfactorily completed in FY2010

Program 1C | Low Carbon Growth Country Studies Program (LCGS)		
Objective | To assist ESMAP client countries achieve low carbon growth by identifying opportunities and related financial, technical, and policy requirements to move towards a low carbon growth path. Country-specific studies help to assess developmental goals and priorities, in conjunction with greenhouse gas mitigation opportunities, and estimate incremental costs and benefits of lower carbon growth.		
Output 1 | Conduct Low Carbon Growth (LCG) country-specific studies to examine pathways and interventions to support low carbon growth to 2030		
■ Indicator | Number of LCG studies developed and fully completed		
2009	Planned | 1	Actual | 1 ■ Mexico Low Carbon Growth Study
2010	Planned | 3	Actual | 3 ■ Brazil Low Carbon Growth Study ■ China Low Carbon Growth Study ■ India Low Carbon Growth Study
2011	Planned | 3	Actual | 3 ■ Indonesia Low Carbon Growth Study ■ Poland Low Carbon Growth Study ■ South Africa Low Carbon Growth Study
Output 2 | Develop and pilot learning-by-doing activities within an analytic framework to facilitate country-specific assessment of low carbon power system development paths		
■ Indicator | Number of country-specific analytic frameworks applied and tested		
2009	Planned | 0	Actual | n/a
2010	Planned | Concept note for analytic framework	Actual | Concept note approved (Apr 2010)
2011	Planned | Draft Framework	Actual | 0 ■ Project initiated in Nigeria to explore low carbon options for the power sector (output due FY2012) ■ Project initiated in Morocco, but subsequently adapted to focus on power sector system planning in response to client needs (output due FY2012)

Output 3 | Develop an e-learning front end for selected analytic and / or modeling tools developed under LCGS and placed in public domain		
■ Indicator | Number of e-learning front end and/or modeling tools developed		
2009	Planned | 0	Actual | n/a
2010	Planned | 1 activity initiated	Actual | 2 activities initiated ■ E-learning and help facilities for EFFECT tool ■ User-friendly front-end and interface for Marginal Abatement Cost Curve Tool (MACTool)
2011	Planned | Complete activity/tools	Actual |1 activity completed; 2 ongoing ■ EFFECT tool made public and e-learning package developed through World Bank Institute web portal ■ Work continuing on EFFECT tool, with railways component to be added as part of the Macedonia project ■ Work continuing on MACTool, which is likely to be made public in FY2012
Output 4 | Develop knowledge exchange products (brochures, internal workshops, and external forums) on global best practices		
■ Indicator 1 | Number of Brochures produced & disseminated in connection with LCGS pilot studies		
2009	Planned | 1	Actual | 1 ■ Introductory brochure of LCGS published: "Low Carbon Growth Country Studies Program: Mitigating Climate Change Through Development"
2010	Planned | 2	Actual | 3 ■ Low Carbon Growth Country Studies – Getting Started: Experience from Six Countries ■ Brazil Low Carbon Country Case Study ■ Low Carbon Development for Mexico
2011	Planned | 5	Actual | 0 ■ Work started on 4 briefing documents during FY2011 with publication in FY2012: 1. Best Practices for Market-Based Power Rationing: Implications for South Africa 2. Energy Intensive Sectors of the Indian Economy: Path to Low Carbon Development 3. Implementing Energy Efficiency and Demand Side Management: South Africa's Standard Offer Model 4. Transition to a Low Carbon Economy in Poland
■ Indicator 2 | Number of internal workshops and learning events delivered in conjunction with WBI and CCDP		
2009	Planned | 1	Actual | 1 ■ Energy Learning event – Low Carbon Development (April, 2009)
2010	Planned | 3	Actual | 5 ■ Low Carbon Growth Country Studies: Emerging Lessons and Results (Sep 2009) ■ Low Carbon Growth Studies: Getting Started (Jan 2010) ■ Low Carbon Development Hands-on Workshop (April 2010) ■ Low Carbon Training ECA PREM Country Teams (May 2010) ■ Low Carbon Growth Seminar ECA Regional Management Team (May 2010)
2011	Planned | 2	Actual | 3 ■ Brown Bag Lunch on TAMT for WB participants (Jul 2010) ■ LAC/ESMAP session on low carbon development during SDN week (Mar 2011) ■ Client-delivered presentation on low carbon development in Mexico during ESMAP CG meeting (Mar 2011)
■ Indicator 3 | Number of external forums delivered by ESMAP and/or in cooperation with WBI/CCDP to disseminate lessons and share information with global energy practice		
2009	Planned | 1	Actual | 1 ■ UNFCCC Meetings in Bonn, Germany

2010	Planned | 7	Actual | 9 ■ Carbon Expo, Cologne ■ UNFCCC Meetings: Bangkok ■ UNFCCC Meetings: Barcelona ■ UNFCCC Meetings: Copenhagen ■ Nigeria Technical Discussions on Low Carbon Development in the Power Sector ■ SIDA-WB Energy Dialogue ■ Morocco Country Dialogue on Low Carbon Development ■ Vietnam Dialogue on Climate Change and Low Carbon Growth ■ Brazil Launch of the Low Carbon Study
2011	Planned | 1	Actual | 3 ■ Africa Forum training session on Building Consensus for Low Carbon Development (Jul 2010) ■ Training on Low Carbon Development and EFFECT in Hanoi, Vietnam (Oct 2010) ■ LCD/ EFFECT training and outreach activities by WBI at Carbon Expo (May 2011)

PROGRAM COMPONENT 2 | ENERGY EFFICIENT CITIES INITIATIVE (EECI)

Program / Initiative 2 | Energy Efficient Cities Initiative (EECI) Objective | To assist cities in ESMAP client countries enhance energy efficiency in the delivery of city services. EECI is a flexible, cross-cutting, demand-driven program that identifies innovative ways to improve the energy efficiency of major cities and reduce the costs and environmental impacts of energy use.		
Output 1 | Conduct city-specific Energy Efficiency Assessments		
■ Indicator | Number of Tool for Rapid Assessment of City Energy (TRACE) assessments conducted for evaluating EE opportunities across all key city sectors		
2009	Planned | 0	Actual | 0
2010	Planned | 1	Actual | 1 ■ Field testing and validation (Quezon City, Philippines)
2011	Planned | 2	Actual | 4 ■ TRACE deployed in four cities (Gaziantep, Turkey; Da Nang, Vietnam; Surabaya, Indonesia; and Cebu, Philippines)
Output 2 | Design programmatic EE interventions for urban sector development		
■ Indicator 1 | Number of TA activities on EE provided to cities to complement Cities Alliance's City Development Strategy grant		
2009	Planned | 0	Actual | 0
2010	Planned | 2	Actual | 1 ■ Quezon City – Philippines (Jan 2010)
2011	Planned | 2	Actual | 1 ■ Zarqa City, Jordan (Sep 2010)
■ Indicator 2 | Number of AAA and project preparation support provided to client countries to design and/or incorporate programmatic EE measures into WB Urban Sector lending operations		
2009	Planned | 1	Actual | 1 ■ Energy Chapter for East Asia Eco2

2010	Planned | 3	Actual | 8 ■ *Public Procurement of Energy Efficiency* ■ Energy Efficient Cities: Assessment Tools and Benchmarking Practices ■ West Bank - Assistance to Develop a Municipal Energy Efficient Retrofit Pilot ■ WB/GEF China Tianjin Eco-city Project: Assistance in design and preparation of the green building component (approved by Board in Jul 2010) ■ WB China Ningbo New Countryside Development Project: Assistance in design and preparation of the small township building energy efficiency pilot and demonstration (approved by Board in Feb 2010) ■ GEF Macedonia Sustainable Energy Project: Assisted in project restructuring to include municipal EE component and development of national buildings program. ■ Energy Efficiency Indicators: Best Practice and Potential Application in Developing Countries ■ Implementing Energy Monitoring and Targeting at Lusaka (Zambia) Water and Sanitation Company
2011	Planned | 3	Actual | 9 ■ *Public Procurement of Energy Efficiency Services-Getting Started* ■ Public Procurement of Energy Efficiency Services-WBI E-Learning Course ■ Mainstreaming Building Energy Efficiency Codes in Developing Countries-Global Experience and Lessons from Early Adopters ■ Developing an Energy-Efficient Urban Transport Plan for Zarqa City (Jordan) Downtown Area ■ *A Primer on Energy Efficiency for Municipal Water and Wastewater Utilities* ■ *Best Operational and Maintenance Practices for City Bus Fleets to Maximize Fuel Economy* ■ Ukraine Energy Efficiency Project: Assisted in project appraisal; project includes municipal EE component ■ Green Energy Schemes for a Low carbon Shanghai (China) ■ Energy Efficiency in Public Buildings Market Assessment Report for New Delhi (India)
Output 3 | Conduct knowledge exchange products (brochures, internal workshops, and external forums) on global best practices		
■ Indicator 1 | Number of case studies and/or tools developed to share lessons and best practices on EE achievements		
2009	Planned | 0	Actual | 0
2010	Planned | 12	Actual | 9 ■ Performance contracting for street lighting in Akola (India) ■ Water pressure management in Emfuleni (South Africa) ■ Landfill gas recovery in Tianjin (China) ■ Rapid bus transit system in Bogota (Colombia) ■ Energy efficiency in public buildings in Kiev (Ukraine) ■ LEDs for traffic signals in Portland, Oregon, (USA) ■ Solid waste compositing in Lahore, (Pakistan) ■ Water and energy efficiency in Monclova & Border Frontera (Mexico) ■ Taxi scrapping and recycling in Cairo (Egypt)
2011	Planned | 5	Actual | 8 ■ Energy management systems in public buildings in Lviv (Ukraine) ■ Low-energy building standards through sale of city-owned land in Muenster (Germany) ■ Enforcement of residential building energy efficiency codes in Tianjin (China) ■ Congestion charges for urban transport in London (UK) ■ Energy management in the provision of water services in Campinas (Brazil) ■ Water and sewerage management contract in Yerevan (Armenia) ■ Post-conflict water and sewerage rehabilitation in Mostar (Bosnia & Herzegovina) ■ Municipal energy efficiency fund in Ann Arbor, Michigan (USA)

■ Indicator 2 | Database of case studies developed		
2009	Planned | 0	Actual | n/a
2010	Planned | 1	Actual | 1 ■ Database launched in Oct 2009
2011	Planned | 0	Actual | n/a
■ Indicator 3 | Virtual Panel established to inform the development of TRACE		
2009	Planned | 0	Actual | n/a
2010	Planned | 1	Actual | 1 ■ Virtual panel established (Oct, 2009)
2011	Planned | 0	Actual | n/a
■ Indicator 4 | Number of practitioners' workshops		
2009	Planned | 2	Actual | 1 ■ Practitioners' Roundtable (Oct 2008; Washington, DC)
2010	Planned | 3	Actual | 4 ■ International Workshop on Mainstreaming Building Energy Efficiency Codes in Developing Countries (Washington, DC) ■ Financial and Technical Solutions for Sustainable Cities (Brasilia, Brazil) ■ Implementing Municipal Energy Efficiency Programs (Kazan, Russia) ■ International Roundtable on Energy Efficiency Metrics and National Energy Efficiency Assessments in Developing Countries (Washington, DC)
2011	Planned | 2	Actual | 0 NOTE | Two workshops were proposed (India and South Africa) but were postponed by the region due to competing priorities
■ Indicator 5 | City awards for EE implementation launched and operational		
2009	Planned | 0	Actual | 0
2010	Planned | 1	Actual | 1 ■ City Awards launched in Jan 2010 (first round of awards ceremony scheduled for April 2011)
2011	Planned | 0	Actual | n/a
■ Indicator 6 | Number of internal and external outreach events to disseminate lessons and share information on EE		
2009	Planned | 5	Actual | 7 ■ ICLEI Local Government climate Session side event at COP-14 (Dec 2008; Poznan) ■ Energy Efficiency in Cities session at the World Bank's Energy Week (Mar 2009; Washington DC) ■ Energy Efficiency Global Forum (Apr 2009; Paris) ■ Senior policy seminar on Climate Change, Housing and Liveable Cities in Asia and Africa (Jun 2009; Singapore) ■ Two parallel sessions at the World Bank's 5th Urban Research Symposium — Cities and Climate Change: Responding to an Urgent Agenda (Jun 2009; Marseilles) ■ International Roundtable : Energy Efficiency Indicators and National Energy Efficiency Performance Assessment (Jun 3-4, 2010; Washington, DC)

2010	Planned | 4	Actual | 5 ■ International Workshop: Mainstreaming Building Energy Efficiency Codes in Developing Countries (Nov 2009; Washington, DC) ■ The EE Public Procurement training session at the World Bank's SDN Week (Jan 2010) ■ BBL: Energy Efficiency in West Bank Municipalities (held during CG meetings sessions; Mar 2010) ■ The West African Regional Workshop on Energy Efficiency (Apr 2010; Ouagadougou) ■ The Energy Efficiency Global Forum (May 2010; Washington, DC)
2011	Planned | 3	Actual | 13 ■ APEC Cooperative EE Design for Sustainability (Sep 2010; Bangkok) ■ 21st World Energy Congress (Sep 2010; Montreal) ■ BBL: Launch of RAF (TRACE) Tool (Sep 2010; Washington, DC) ■ BBL: Mainstreaming Building Energy Efficiency Codes in Developing Countries (Oct 2010; Washington, DC) ■ BBL: Public Procurement of Energy Efficiency Services-Getting Started (Nov 2010; Washington, DC) ■ Sustainable Buildings Network Conference (Nov 2010; Paris) ■ BBL: Urban Climate Tools-A Joint Discussion on Synergy and Comparability (Dec 2010; Washington, DC) ■ APEC CEEDS Workshop (Jan 2011; Hong Kong) ■ BBL: The Future of Cities (Feb 2011; Washington, DC) ■ BBL: Green Financial Incentives for the District of Columbia (cosponsored with Eco2 Program; Mar 2011; Washington, DC) ■ World Bank Energy Week '11: Sustainable Energy and Cities Session (Mar 2011; Washington, DC) ■ Seminar for World Bank procurement staff: Public Procurement of Energy Efficiency Services (Mar 2011; Washington, DC) ■ World Bank Africa SDN Staff Training (Mbuyu) Event: What will Africa's Cities Look Like in the Future? (Mar 2011; Washington, DC)

PROGRAM COMPONENT 3 | RENEWABLE ENERGY MARKET TRANSFORMATION STRATEGY (REMTI)

Program / Initiative 3 | Renewable Energy Market Transformation Initiative (REMTI) Objective | To assist ESMAP client countries diversify their energy supply mix and scale up deployment of renewable energy technology. REMTI aims at helping countries to address the preparatory work needed in the upstream stages of program development by providing technical assistance, knowledge sharing, and capacity building to facilitate access to financing.		
Output 1 | Conduct country-specific Market Transformation Strategies to scale up deployment of grid-tied RE systems		
■ Indicator | Number of strategies completed and deployed		
2009	Planned | 2	Actual | 2 ■ Market Transformation Strategy – Iran ■ Market Transformation Strategy – Slovakia
2010	Planned | 2	Actual | 4 ■ Market Transformation Strategy – Colombia ■ Market Transformation Strategy – Bulgaria ■ Renewable Energy Development – Philippines ■ Evaluating Renewable Energy Targets – China

2011	Planned | 2	Actual | 4 ■ Unleashing the Potential of Renewable Energy in India ■ Belarus Renewable Energy Legal and Regulatory Framework Harmonization with EU ■ Mexico Renewable Energy Technical Assistance Program ■ Turkey Smart Grids (AMAG) Technical Assistance Program – Summary Report
Output 2 | Develop country/regional roadmaps for scaling up RE technology deployment for accelerated utilization of RE resources (CSP, geothermal, wind, hydro) for grid-tied power supply		
■ Indicator | Number of country /regional road maps adopted by client countries		
2009	Planned | 4	Actual | 1 ■ Egypt Commercial Wind Development Framework
2010	Planned | 1	Actual | 2 ■ North Africa Regional CSP Initiative ■ Overcoming Barriers to Hydropower Investment - Peru
2011	Planned | 2	Actual | 4 ■ Regulatory and Financial Incentives for CSP ■ Design and Performance of Policy Instruments to Promote Renewable Energy in Developing Countries ■ Retrospective Review of Mini-Hydro Facilities on Irrigation Dams and Canal Drops In India ■ Peru Opportunities and Challenges of Small Hydropower Development
Output 3 | Design a market support mechanism to facilitate grid-tied deployment of RE technologies for power generation by low-income client countries		
■ Indicator | Mechanisms for an Output-Based Revenue Support Mechanism developed and accepted for implementation by donors and client countries		
2009	Planned | 0	Actual | n/a
2010	Planned | Basic OBA design	Actual | Completed ■ Concept Paper (draft) and presentation on "Market Development Support Mechanisms for Scaling Up Renewable Energy" (Presented to DFID in Jan 2010)
2011	Planned | OBA concept shared and reviewed by donors and other stakeholders	Actual | Completed ■ New work program on Results-Based Funding (building on earlier OBA/AMC concept and discussions) endorsed by CG meeting ■ ESMAP/GPOBA/PPIAF window launched to support African RBF design and piloting ■ Work started on the concept note for the RBF work program leading to engagement with internal and external stakeholders, including participants in the Scaling-up Renewable Energy Program (SREP) and the Energy+ partnership
Output 4 | Conduct knowledge exchange products (brochures, internal workshops, and external forums) on global best practices		
■ Indicator 1 | Number of Policy Notes to share ESMAP lessons, results and best practices on country-specific Strategies and/or Road Maps		
2009	Planned | 0	Actual | n/a
2010	Planned | 2	Actual | 0
2011	Planned | 3	Actual | 0 NOTE | There are four notes under development – Peru hydro, Mexico, India hydro, Philippines
■ Indicator 2 | Number of internal workshops and learning events to share experience within WBG		
2009	Planned | 3	Actual | 0
2010	Planned | 5	Actual | 1 ■ CSP Action Planning Workshop (Oct 2009)

2011	Planned | 5	Actual | 2 ■ BBL with Bloomberg New Energy Finance (BNEF) on renewable energy investment trends in India, China, and Brazil ■ Subscription for the regional units to Bloomberg New Energy Finance information services on renewable energy
■ Indicator 3 | Number of external forums to disseminate lessons and share information with global energy practice (in partnership with external organizations such as REEEP, IRENA)		
2009	Planned | 1	Actual | 0
2010	Planned | 1	Actual | 2 ■ Knowledge Exchange Forum — CG meeting (Mar 2010) ■ CSP Workshop, Mozambique
2011	Planned | 1	Actual | 5 ■ REMTI presentation at DIREC conference in India (Oct 2010) ■ Turkey Smart Grids (AMAG) training/workshops for Power Grid Company (TEIAS) ■ Regional geothermal training workshop: Geothermal policies and project development (sponsored by AU; Dec 7-11, 2010; Kigali, Rwanda) ■ Addis Ababa, Ethiopia, Aug 20, 2010: Geothermal project development in Ethiopia ■ Panama Geothermal Workshop, Geothermal power for Central America (May 2010, Panama City)
■ Indicator 4 | Number of best-practice case studies prepared		
2009	Planned | 1	Actual | 0
2010	Planned | 2	Actual | 1 ■ *Best Practice Guidelines for Mesoscale Wind Mapping Projects for the World Bank* (Nov, 2009)
2011	Planned | 2	Actual |3 ■ Electricity Auctions: An Overview of Efficient Practices ■ Mexico Renewable Energy Least Cost Planning and Targets Study ■ Transmission Expansion for Renewable Energy Scale-up

PROGRAM COMPONENT 4 | PRO-POOR ENERGY ACCESS TA PROGRAMS (PEA-TAP)

Program 4A | Africa Electrification Initiative (AEI) Objective| To develop and sustain a living body of practical knowledge and a network of Sub-Saharan Africa practitioners in the area of planning and implementation of rural, peri-urban and urban electrification programs.		
Outputs | Conduct knowledge exchange products (website, blog, discussion papers, policy notes, workshops, web sites, external forums, blogs, etc.) on global best practices		
■ Indicator 1 | Number of case studies published and disseminated under AEI		
2009	Planned | 0	Actual | 0
2010	Planned | 2	Actual | 7 ■ 5 Discussion Papers completed: 1. Ongrid and Off-grid Small Power Producers in Africa: Key Implementation Questions For Electricity Regulators 2. Carbon Finance: Challenges and Opportunities in the Electrification Sector in SSA 3. Offgrid: Hybrid Models 4. Pico PV 5. Productive Uses (developed with GIZ and EU Energy Initiative Partnership Dialogue Facility (EUEI-PDF)) ■ 2 Technical/Research Papers: 6. Access to Electricity in SSA 7. Subsidy Matrix

2011	Planned | 2	Actual | 4 ■ Discussion paper completed: 1. Microfinance for Off-grid Electrification ■ Technical/Research Papers: 2. On-Grid and Off-Grid Small Power Producers in Africa: Key Implementation Questions for Electricity Regulators 3. Grid Extension in Rural Benin: Micro-Manufacturers and the Electrification Trap (AEI in Cooperation with GIZ) 4. Impact Evaluation of Productive Use – An Implementation Guide for Electrification Projects (AEI in cooperation with GIZ)
■ Indicator 2 | Number of thematic BBLs / mini-workshops organized		
2009	Planned | 0	Actual | 0
2010	Planned | 0	Actual | 1 ■ Support provided to Rwanda Electricity Company (RECO) to identify speakers for the regional mini-workshop on Access to Electricity and Development of Local Industries in East Africa (Apr 2010)
2011	Planned | 0	Actual | 3 ■ Symposium on Small PV-Applications, Rural Electrification and Commercial Use (Jun 6-7, 2011; University of Applied Sciences Ulm, Germany) ■ World Bank Energy Week 2011 – panels on Institutional Approaches to Electrification and Innovative Financing for Rural Electrification (Mar 14-16, 2011; Washington, DC) ■ Seminar on Small Power Producers in Tanzanian Villages (Nov 19, 2010; Washington, DC)
■ Indicator 3 | Development of a web site		
2009	Planned | 0	Actual | ESMAP/AEI website initiated
2010	Planned | 0	Actual | AEI website completed and launched http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/AFRICAEXT/EXTAFRREGTOPENERGY/0,,contentMDK:22404873~menuPK:6613283~pagePK:34004173~piPK:34003707~theSitePK:717306,00.html ■ The proceedings and the presentations of the AEI workshop have been posted on the WB website - Energy in Africa ■ Development of an online archive of operational documents for electrification in partnership with PPP in Infrastructure Resource Center for Contracts, Laws and Regulation (PPPIRC); some of the documents have been translated to English and French
2011	Planned | 0	Actual | Website reorganized and updated ■ Events space included in the website ■ Additional operational documents uploaded to the "Practitioners' Documents" archive
■ Indicator 4 | Development of the Online Social Collaborative Network		
2009	Planned | 0	Actual | 0
2010	Planned | 0	Actual | AEI Online Social Collaborative Network completed ■ AEI Blog mail@africaelectrificationinitiative.ning.com; ■ 130 participants up to date; ■ Online discussions on: 1. Ongrid and Off-grid Small Power Producers in Africa: Key Implementation Questions For Electricity Regulators 2. Carbon Finance: Challenges and Opportunities in the Electrification Sector in SSA 3. Hybrid mini-grids 4. Pico PV 5. Microfinance and Rural Electrification

2011	Planned | 0	Actual | AEI Online Social Collaborative Network expanded ■ 187 participants reached ■ Online discussions on: 1. Different Institutional Approaches to Electrification 2. Energy Access for the Urban Poor (with ESMAP) 3. Strategies for Promoting Productive Uses of Electricity (with EUEI-PDF) ■ Call for Papers announced for the member community

Program 4B | Energy SME Development Strategies (ESMED) — Energy Access for the Urban Poor		
Objective | To create and sustain a network of energy practitioners to support development of SMEs as users and providers of modern energy services for urban slum upgrading programs.		
Output 1 | Develop and implement community-adapted Energy Access Programs for households and SMEs in client countries aligned with Cities Alliance-sponsored nationwide Slum Upgrading Action Plans		
■ Indicator | Number of Energy Access Programs implemented for households and SMEs in client countries		
2009	Planned | 0	Actual | 0
2010	Planned | 3	Actual | 1 ■ One program implemented in Ghana. In Uganda, the procurement process was cancelled. It has been re-activated. The program in Vietnam, the third country, was cancelled due to budgetary constraints. Milestones should be revised to 2.
2011	Planned | 0	Actual | 1 ■ The program implemented in Ghana was a scoping study of three slum communities. This was completed, with the resulting report published on the ESMAP website. The findings were presented at the African Electrification Initiative conference held in Dakar in November 2011 (with cofinancing by EUEI PDF).
Output 2 | Conduct demand-responsive capacity building support for community energy institutions and community-based institutions		
■ Indicator | Number of capacity building activities conducted to support institutions and higher learning community-based organizations		
2009	Planned | 0	Actual | 0
2010	Planned | 1	Actual | 3 ■ Program planning workshop in Ghana resulted in the input of all stakeholders to enhance the objectives of the program. ■ Project kickoff meeting was held in Ghana to introduce the project to government institutions and service providers. Their feedback was instrumental in shaping the research areas. ■ Training of Energy Center staff and enumerators supplied by the communities in survey design and techniques, questionnaire administering, and design of database CS Pro, which will be used for data collection and analysis.
2011	Planned | 3	Actual | 0 ■ A review of the program was undertaken in FY11. The review resulted in a change in program design to better reflect ESMAP's strategy in energy access.
Output 3 | Conduct knowledge exchange products (policy notes, internal workshops, and external forums) on global best practices		
■ Indicator 1 | Conduct two practitioners' forums in partnership with Cities Alliance to promote knowledge exchange among (a) community-based energy access working groups		
2009	Planned | 0	Actual | 0
2010	Planned | 2	Actual | 0 NOTE | The Cities Alliance program is still at the program design stage in Ghana and Uganda.

2011	Planned | 0	Actual | 0
■ Indicator 2 | Conduct twp practitioner's forums in partnership with Cities Alliance to promote knowledge exchange among (b) SME energy service providers		
2009	Planned | 1	Actual | 0
2010	Planned | 2	Actual | 0
2011	Planned | 2	Actual | 1 ■ ESMAP is currently organizing several multi-stakeholder virtual forums and a physical workshop to support energy access practitioners. The forums are expected to gather insights from energy practitioners who have had success in implementing energy access projects for the urban poor. Their input and expertise will provide a basis for designing ESMAP's energy access work for urban and peri-urban communities. The forums will also draw on previous ESMAP initiatives in this area, particularly the recent scoping study commissioned in Ghana, and a report of 8 case studies of successful energy access for the urban poor initiatives compiled by The Energy Research Institute of India (TERI). The forums are expected to be completed by June 2011.
■ Indicator 3 | Publish and disseminate two brochures to share lessons, results, and best practices		
2009	Planned | 1	Actual | 0
2010	Planned | 4	Actual | 0 NOTE | A brochure for the project , case studies documenting best practices in energy access for the urban poor, and report for scoping study in Ghana will be published during third quarter of FY2011.
2011	Planned | 1	Actual | 2 ■ The energy access brochure has been finalized and is ready for printing. ■ The best practice case studies on "Improving Energy Access to the UrbanPoor in Developing Countries" comprised 8 cases of successful energy access initiatives in India, Bangladesh, Colombia and Brazil. The report aims to inform the energy access community (including practitioners, civil society groups, project planners, end users) about best practices of successful energy access initiatives targeted at slum dwellers. This report is now available on the ESMAP website. The cases include: 1. The Ahmedabad Slum Electrification Project (India) 2. Provision of Electricity to Pavement Dwellers in Mumbai: An Urban Poor Community's Initiative to Get Energy Access (India) 3. Sulabh Biogas Plants Fuelled by Human Excreta (India) 4. Safe and Legal Connections for Consumers in Slum Communities: A Case in New Delhi (India) 5. Natural Gas Distribution for Low Income Families in the Caribbean Coast and South West Regions of Colombia (Colombia) 6. Commercialization of Improved Cook Stoves (ICS) for Reduced Indoor Air Pollution in Urban Slums of North West Bangladesh (Bangladesh) 7. Mobile Retail Dealers (MRDs) for Distributing LPG Bottles in Bangladesh by TOTALGAZ (Bangladesh) 8. COELBA Community Agent Project (Brazil)

Program 4C | Gender and Energy Development Strategies (GEDS)
Objective | To create and sustain a team of energy practitioners to support gender-sensitive approaches to energy sector development.
Output 1 | Develop energy-specific Gender Strategies for regions and thematic programs to enhance gender in the Energy Sector based on gender analysis and action research
■ Indicator | Number of Gender Strategies carried out and completed

2009	Planned | 0	Actual | n/a (GEDS program launched in Jul 2009)
2010	Planned | 2	Actual | 2 strategies initiated ■ Africa Gender & Energy Program ■ Gender and Youth in Extractive Industries Program
2011	Planned | 2	Actual | 2 strategies under implementation ■ Africa Gender & Energy Program – activities being initiated and carried out in 6 countries (Mali, Tanzania, Senegal, Kenya, Liberia, Benin) ■ Gender and Extractive Industries Program – gender sensitive approach being carried out in 8 countries (Papua New Guinea, Solomon Islands, Mongolia, DRC, Tanzania, Uganda, Malawi)
Output 2 | Conduct capacity building programs/forums and establish platforms of dialogue between Gender & Energy experts and client counterparts		
■ Indicator 1 | Number of regional workshops on gender and energy organized		
2009	Planned | 0	Actual | n/a (GEDS program launched in July 2009)
2010	Planned | 1	Actual | 1 ■ Mainstreaming Gender Equality in Infrastructure Projects , Workshop in Peru, 2009
2011	Planned | 2	Actual | 4 ■ ESMAP Knowledge Exchange Forum ■ Energy Week – presentations during various sessions ■ Extractive Industries Sector Week – gender session ■ Gender and Energy experts group established
• Indicator 2 | Number of Gender and Energy training events		
2009	Planned | 1	Actual | n/a (GEDS program launched in July 2009)
2010	Planned | 1	Actual | 1 ■ Workshop: Energy & Gender Capacity Building in South Asia (Jun 2010; Bangladesh)
2011	Planned | 2	Actual | 3 ■ The Experience of the AFREA Gender Mainstreaming Program and Learning from Tanzania: Africa Regional Workshop on Mainstreaming Gender Equality in Infrastructure Policies and Projects (Mar 2011; Ethiopia) ■ Gender Equality and Access to Energy Services: the Experience of the Rural Electrification Agency of Mali: Africa Regional Workshop on Mainstreaming Gender Equality in Infrastructure Policies and Projects (Mar 2011; Ethiopia) ■ Introduction to Gender and Energy Concepts (Rural Energy Agency, Tanzania) — Gender Awareness Training
Output 3 | Conduct knowledge exchange products (brochures, tools, templates internal workshops, and external forums) on global best practices		
■ Indicator 1 | Number of guidance notes/issues papers developed to share ESMAP lessons, results, and best practices on gender-specific Strategies and/or Road Maps		
2009	Planned | 0	Actual | n/a (GEDS program launched in July 2009)
2010	Planned | 1	Actual | 3 ■ Gender and Energy Issues Paper for WB Energy Strategy ■ Gender Disaggregated Questionnaire for Bangladesh Rural Electrification Impact Assessment ■ Background Note on Gender and Climate Change

2011	Planned | 3	Actual | 4 ■ Draft of Methods and Approaches on Integrating Gender in Africa Energy Programs and Projects Toolkit ■ ESMAP Gender and Energy webpage designed, developed and launched (www.esmap.com/esmap/energyandgender) ■ Corporate Reviews and Contributions to WDR Gender and Development 2012 ■ Contribution to the Biomass Energy Initiative in Africa (BEIA)
■ Indicator 2 | Number of Energy and Gender tools, templates, or best-practice case studies		
2009	Planned | 0	Actual | n/a (GEDS program launched in Jul 2009)
2010	Planned | 0	Actual | n/a
2011	Planned | 2	Actual | 3 ■ Making Energy Work for Women and Men: Tools for Task Teams ■ Lighting Africa Report: Expanding Women's Role in Africa's Modern Off-Grid Lighting Market ■ IFC Smart Lessons: Striking Gold: Women in Mining Initiative in Papua New Guinea
■ Indicator 3 | Number of internal workshops and learning events carried out to share experience within the World Bank Group		
2009	Planned | 1	Actual | 1 ■ Gender & Energy Learning Days during Energy Week 2009 (Washington, DC)
2010	Planned | 1	Actual | 1 ■ Energy, Gender and Climate Change Session during SDN 2010 Week (Washington, DC)
2011	Planned | 1	Actual | 3 ■ ESMAP Knowledge Exchange Forum ■ Energy Sector Week ■ Extractive Industries Sector Week
■ Indicator 4 | Number of external forums carried out to disseminate lessons and share information with global energy practice		
2009	Planned | 0	Actual | 3 ■ SAWIE Conference – South Asia Women in Executive Exchange (Apr 2009; Washing ton DC) ■ Women's Rights and Gender Equality Seminar (Apr 2009; Tanzania) ■ Gender and Energy Solutions Workshop (May 2009; Mozambique)
2010	Planned | 0	Actual | n/a
2011	Planned | 1	Actual | 3 ■ Africa Regional Workshop on Mainstreaming Gender Equality in Infrastructure Policies and Projects (March 2011; Ethiopia) ■ Launch of BEIA pilots event (Dec 2010; Nairobi, Kenya) ■ Introduction to Gender and Energy Concepts (Oct 2010; Rural Energy Agency, Tanzania)

ANNEX III

WORLD BANK GROUP LENDING OPERATIONS INFLUENCED BY ESMAP ACTIVITIES, FY2009-11

Over the past three fiscal years (FY2009-11), ESMAP activities have contributed to the identification and design of approved World Bank Group energy lending of US$11.75 billion. The following is a list of lending operations influenced by ESMAP activities during this period.

WBG Lending Operation	Region	Country
Energy Access Project	AFR	Burkina Faso
Energy Sector Development Project	AFR	Cameroun
Growth with Governance in the Mineral Sector	AFR	Democratic Republic of the Congo
Energy Development and Access Project (GEDAP)	AFR	Ghana
Electricity Expansion Project	AFR	Kenya
Energy Sector Project	AFR	Malawi
Household Energy and Universal Access Project (Additional Financing)	AFR	Mali
Energy Development and Access Project (EDAP)	AFR	Mozambique
Southern African Power Market Project (Adjustable Programmatic Loan 1)	AFR	Regional
Regional and Domestic Power Market Development Project	AFR	Regional
Mozambique-Malawi Transmission Interconnection Project (Adjustable Programmatic Loan 2)	AFR	Regional
Electricity Access Scale-up and Sector Wide Approach Development Project	AFR	Rwanda
Sustainable and Participatory Energy Management Project II (PROGEDE II)	AFR	Senegal
Sustainable Management of Mineral Resources	AFR	Tanzania
Energy Development and Access project	AFR	Tanzania
Rural Electrification and Transmission Project	EAP	Cambodia
Guangdong Green Freight Demonstration Project	EAP	China

WBG Lending Operation	Region	Country
Global Environment Facility Tianjin Eco-city Project	EAP	China
Global Environment Facility Provincial Energy Efficiency Scale-up Program	EAP	China
Shangdong Province Energy Efficiency	EAP	China
Ningbo New Countryside Development Project	EAP	China
Climate Change Development Policy Loan	EAP	Indonesia
Rural Electrification Project of the Rural Electrification Program, Phase I (Adaptable Program Loan)	EAP	LAO
Rural Electrification Project, Phase II	EAP	LAO
Mining Sector Technical Assistance Project	EAP	Mongolia
Mining Sector Institutional Strengthening Technical Assistance, II	EAP	Papua New Guinea
Clean Technology Fund (IFC)	EAP	Philippines
Kunming Urban Rail Project	EAP	Regional
Vietnam Transmission and Distribution (Additional Financing 2)	EAP	Vietnam
Poverty Reduction Strategy Credit 9 for Vietnam	EAP	Vietnam
Electricity Supply Reliability Project	ECA	Armenia
Global Environment Facility Sustainable Energy Project	ECA	Macedonia
Energy Project II (Additional Financing)	ECA	Moldova
Energy Efficiency Development Policy Loan	ECA	Poland
Energy Community of South East Europe (Adaptable Program Loan)	ECA	South Eastern Europe
Programmatic Electricity Sector Development Policy Loan	ECA	Turkey
Energy Community of South East Europe (Adjustable Programmatic Loan 6)	ECA	Turkey
Private Sector Renewable Energy and Energy Efficiency Project	ECA	Turkey
Environmental Sustainability and Energy Sector (Development Policy Loan 2)	ECA	Turkey
Energy Efficiency Project	ECA	Ukraine
Decentralized Infrastructure for Rural Transformation Project (IDTR)	LAC	Bolivia
Energy Investments and Technical Assistance	LAC	Jamaica
Rural Electrification Project I	LAC	Peru
Rural Electrification project II	LAC	Peru
Electrobras Distribution Rehabilitation Project	LCR	Brazil
Power Sector Efficiency Enhancement Project (PROMEF)	LCR	Honduras
Framework for Green Growth Development Policy Loan	LCR	Mexico
Low Carbon Development Policy Loan	LCR	Mexico
Global Environment Facility Wind Umbrella Project III	LCR	Mexico

WBG Lending Operation	Region	Country
Global Environment Facility Energy Efficiency Lighting and Appliances GEF Project	LCR	Mexico
Rural Electrification Project	LCR	Peru
Giza North Power Project	MNA	Egypt
Ain Sokhna Power	MNA	Egypt
Wind Power Development Project	MNA	Egypt
Helwan South Power Project	MNA	Egypt
Urban Transport Sector Development Policy Loan	MNA	Morocco
Energy Sector Development Policy Loan	MNA	Morocco
Energy Efficiency and Renewable Energy Investment Project	MNA	Tunisia
Municipal Development Program, Phase I	MNA	West Bank
Clean Air Sustainable Environment (CASE) Project	SAR	Bangladesh
Rural Electrification and Renewable Energy Development (RERED; Additional Financing)	SAR	Bangladesh
Kabeli Transmission Project	SAR	India
IFC Loan for Maharashtra State Electricity Transmission Corporation Limited (MSETCL)	SAR	India
Haryana Power System Improvement Project	SAR	India
Coal-Fired Generation Rehabilitation	SAR	India
Coal-Fired Generation Rehabilitation II	SAR	India
Electricity Distribution and Transmission Improvement Program Project	SAR	Pakistan

World Bank Regions | **AFR** – Africa | **EAP** – East Asia and Pacific | **ECA** – Europe and Central Asia | **MNA** – Middle East and North Africa | **LCR** – Latin American and the Caribbean | **SAR** – South Asia

ANNEX IV

COMPLETED, NEW, AND ONGOING ACTIVITIES, FY2011

COMPLETED ACTIVITIES

Country/Region	Activity	Task Manager
ENERGY ASSESSMENTS AND STRATEGY PROGRAMS		
Bulgaria, Latvia, Ukraine	Impact of Financial Crisis on Power Sector	Edon Vrenezi, Ani Balabanyan
Chile	Support for Development of National Energy Efficiency Program	Lucia Spinelli
China	Power Dispatch Energy Efficiency Improvement	Beatriz Arizu de Jablonski
EAP	East Asia Regional Energy Flagship Study	Xiaodong Wang
Global	National Oil Companies Case Studies	Silvana Tordo
Global	Country Energy Efficiency Performance Indicators	Feng Liu
LCR	Programmatic Approach in Support of the Power Sector in Central America	Xiaoping Wang
LCR	A Strategic Overview on Energy Procurement and Best Practices in Energy Auctions	Luiz T. A. Maurer
LCR	Environmental Action Plan, Phase II (Energy, Environment & Population)	Alonso Zarzar Casis
SAR	South Asia Regional Energy Sector Vulnerability Assessment	Mohua Mukherjee
Turkey	Capacity Building for Electricity Market Operations	Sergio Augusto Gonzalez-Coltrinari
Vietnam	Fuel Efficiency, Trade Facilitation	Moustafa El-Hefnawy
ENERGY ACCESS		
Global	Gender and Energy Development Program	Nilufar Ahmad
Global	Household Energy Access | Lessons Learned and Scaling-Up Opportunities	Koffi Ekouevi
Laos	Stimulating Small and Medium Enterprises for Productive Uses of Electricity	Jie Tang
Yemen	Economic Benefits of Electricity Supply	Pierre Audinet

Country/Region	Activity	Task Manager
ENERGY EFFICIENT CITIES		
China	Energy Efficiency in Government Facilities in China	Alberto Ugalde Ang Co
Egypt	Cairo Congestion Study	Ziad Salim EL Nakat
Global	Building Energy Efficiency Codes Compliance	Feng Liu
Global	Rapid Analytical Framework (Tool for Rapid Assessment of City Energy – TRACE)	Ranjan Bose
Global	Urban Mobility Strategies	Ranjan Bose
Global	International Benchmarking Network Energy Monitoring & Targeting Pilot Technical Assistance	Feng Liu
CLEAN ENERGY		
Brazil	Low Carbon Study	Christophe De Gouvello
EAP	Capacity Building for Renewable Energy	Beatriz Arizu de Jablonski
Global	Contribution to Carbon Footprinting	Marcelino Madrigal
Global	External Panel, Energy Supply, Access, and Climate Change	Jane Ebinger
Global	Concentrated Solar Power | Regulatory and Financial Incentives	Nataliya Kulichenko
India	Renewable Energy Investment Climate	Ashish Khanna
India	Strategies for Low Carbon Growth	Kwawu Gaba
Mexico	Low Carbon Development Study	Todd M. Johnson
Mexico	Renewable Energy Assistance Program	Leopoldo Montanez
Peru	Overcoming Barriers to Hydropower	Susan Bogach
Poland	Low Carbon Growth Study	Erika A. Jorgensen
South Africa	Low Carbon Growth Study	Xiaodong Wang

NEW ACTIVITIES

Country/Region	Activity	Task Manager
ENERGY ASSESSMENTS AND STRATEGY PROGRAMS		
Armenia	Study of Demand-Side Management Tools	Ani Balabanyan
Black Sea Region	Regional Energy Sector Note	Salvador Rivera
Bulgaria	Bulgaria Gas Sector Study	Peter Johansen
Global	Cost of Delivering Demand-Side Management, Energy Efficiency Activities	Ashok Sarkar
Global	Private and Public Sector Roles	Maria Vagliasindi
India	The Indian Power Sector | A Stocktaking and Directions for the Future	Sheoli Pargal
LCR	Central America Programmatic Study Module #6 | Diversification of the Energy Matrix	Xiaoping Wang
Maldives	Developing a Regulatory Framework for Maldives Energy Sector	Abdulaziz Faghi
MNA	Assessment of Institutional and Regulatory Framework for Electricity Trade in the Arab World	Husam Mohamed Beides

Country/Region	Activity	Task Manager
Egypt	Egypt Energy Efficiency Strategy	Jianping Zhao
Moldova	Moldova District Heating and Electricity Restructuring	Shinya Nishimura
Nepal	Support to Strategic Energy Sector Development	Michael Haney
SAR	South Asian Regional Energy Assessment	Mohua Mukherjee
Ukraine	Reforming Energy Pricing in Ukraine	Yadviga Viktorivna Semikolenova
Uzbekistan	Energy Efficiency Strategy for Industrial Enterprises in Uzbekistan	Franz Gerner
Uzbekistan	Uzbekistan-Afghanistan-Pakistan Regional Electricity Supply and Trade	Sunil Kumar Khosla
ENERGY ACCESS		
AFR	Road to Durban | Energy Ministers Event	Varadarajan Atur
Haiti	Strategic Development of Household and other Energy Sectors	Karen Bazex
Global	Direct Delivery of Power Subsidy to Rural Areas	Mohinder Gulati
Global	Just in Time Technical Assistance with Local/Global Gender & Energy Experts	Adriana Eftimie
LCR	Central America Programmatic Study Module #7 | Performance of Improved Cook Stoves in Central America	Xiaoping Wang
Peru	Capacity Building for Productive Use of Energy in Peru	Susan V. Bogach
ENERGY EFFICIENT CITIES		
South Eastern Europe	Climate-Friendly Energy Efficiency Policies across South Eastern Europe	Jas Singh
Global	EECI Small Grants (Zarqa)	Ranjan Bose
Global	Energy Efficiency for Water and Sanitation Utilities	Feng Liu
Lebanon	Support for Thermal Building Standards (Energy Efficiency)	Simon J. Stolp
CLEAN ENERGY		
India	Understanding Private Sector Participation in Hydropower Development	Kwawu Mensan Gaba
Jordan	Assessment of Smart Grid Application to Jordan Transmission System	Husam Mohamed Beides
Global	Low Carbon Development in the Power Sector	Venkata Ramana Putti
Nigeria	Climate Change Implications for Growth in the Non-Oil Sector in Nigeria	Raffaello Cervigni
Yemen	Yemen Renewable Energy Framework	Jianping Zhao
Global	Scaling Up the Deployment of Grid-Connected Renewable Energy Technologies in Developing Countries	Cindy Suh
Global	Adaptation Knowledge Dissemination	Jane Ebinger
Global	Adaptation Country Briefs	Jane Ebinger
China	Evaluation of Incentive Mechanisms (Taxation and Pricing) for Wind Power in China	Yanqin Song
Global	Geothermal Handbook	Magnus Gehringer
Serbia	Serbia Low Carbon Energy Path	Arturo S. Rivera

ONGOING ACTIVITIES

Country/Region	Activity	Task Manager
ENERGY ASSESSMENTS AND STRATEGY PROGRAMS		
Belarus	Belarus Energy Efficiency	Pekka Kalevi Salminen
China	China Heat Regulation Phase II	Gailius J. Draugelis
Global	Power Sector Market Structure	Maria Vagliasindi
Global	Flagship Electricity Technology Options Assessment Guide	Istvan Dobozi
Global	Review Design Performance Renewable Energy Policy	Gabriela Elizondo Azuela
LCR	Managing High & Volatile Oil Prices	Ariel Yepes
Pakistan	Support for the Development of Large-Scale Energy Efficiency	Ashok Sarkar
Vietnam	Vietnam Gas Master Plan	Richard Jeremy Spence
Vietnam	Vietnam Energy Reform Dissemination and Outreach	Beatriz Arizu de Jablonski
ENERGY ACCESS		
AFR	Africa Electrification Experience	Dana Rysankova
Global	Work on Gender and Youth in Extractive Industries	Adriana Eftimie
Global	Evaluation of Rural Electrification	Shahidur R. Khandker
Global	ESMED Energy Access for Urban Poor	Koffi Ekouevi
ENERGY EFFICIENT CITIES		
China	Urban Transport Climate Change Strategy	Ke Fang
Global	EECI Small Grants	Jas Singh
Global	EECI Good Practice Awards	Jas Singh
Global	EECI Outreach & Dissemination	Jas Singh
Global	EE Cities Project Support Facility	Feng Liu
Global	EECI Rapid Analytical Framework 2	Ranjan Bose
CLEAN ENERGY		
Global	Rehabilitation of Hydropower Infrastructure	Caroline Van Den Berg
Global	Low Carbon Development Knowledge Products	Jane Ebinger
Global	Electricity Transmission Planning	Marcelino Madrigal
Global	REMTI Coordination & Outreach	Cindy Suh
Global	REMTI Knowledge Exchange	Cindy Suh
India	India Concentrated Solar Power Initiative	Ashish Khanna
Indonesia	Indonesia Low Carbon Growth Strategy	Josef Lloyd Leitmann
Indonesia	Geothermal Risk Mitigation Framework in Indonesia	Migara Jayawardena
LCR	Geothermal Assistance Component	Xiaoping Wang
MNA	North Africa Regional Concentrated Solar Power Initiative	Chandrasekar Govindarajalu
Philippines	Renewable Energy Development	Beatriz Arizu de Jablonski

World Bank Regions | **AFR** – Africa | **EAP** – East Asia and Pacific | **ECA** – Europe and Central Asia | **MNA** – Middle East and North Africa | **LCR** – Latin American and the Caribbean | **SAR** – South Asia

ANNEX V

PUBLICATIONS, FY2011

ISBN, Pub. No., Or Project ID	Country/ Region	Title	Author(s)/PTL/Program
Energy and Mining Sector Board Discussion Paper No. 23	AFR	Household Energy Access for Cooking and Heating | Lessons Learned and the Way Forward	Koffi Ekouevi, Voravate Tuntivate
AFREA Toolkit	AFR	Photovoltaics for Community Service Facilities | Guidance for Sustainability (English & French)	Anil Cabraal, Kate Steel
Lighting Africa Rpt 02/ Oct 2010 Consultant Report	AFR	Solar Lighting for the Base of the Pyramid | Overview of an Emerging Market	Dalberg Global Development Advisors
P105702	Brazil	Brazil Low carbon Country Case Study	Christophe de Gouvello, Britaldo S. Soares Filho, Andre Nassar, Roberto Schaeffer, Fuad Jorge Alves, Joao Wagner, Silva Alves
P120481	Brazil	Good Practices in City Energy Efficiency | Campinas, Brazil –Energy Management in the Provision of Water Services (case study)	Feng Liu
P112532	Chile	Diseño e Implementación de un Programa Piloto de Capacitación en Eficiencia Energética para Municipalidades Chilenas Reporte Final	Fundación Chile for Sergio Taricco Mackay
P099544 WB Policy Note	China	China's Envisaged Renewable Energy Target | The Green Leap Forward	Ximing Peng, Noureddine Berrah
Two-Pager	China	Quexon City Energy Efficiency Summary Report | Field Testing and Validation of an Early Version of the RAF	Ranjan Bose
P120983	EAP	Stimulate Small and Medium Enterprises (SMEs) In Productive Uses of Electricity (presentation)	Jie Tang
P103315 World Bank 978-0-8213-8486-2	EAP	Winds of Change | East Asia's Sustainable Energy Future	Xiaodong Wan, Noureddine Berrah, Subodh Mathur, Ferdinand Vinuya

ISBN, Pub. No., Or Project ID	Country/ Region	Title	Author(s)/PTL/Program
Consultant Rpt	ECA	Crisis Within a Crisis? | How the Financial Crisis Highlights Power Sector Vulnerabilities in Europe and Central Asia Region	Ani Balabanyan, Edon Vrenezi, Lauren Pierce, Denzel Hankinson
P118724	ECA	Financial Crisis | Threat or Opportunity for Power Sectors of ECA Countries?	Ani Balabanyan, Edon Vrenezi, Denzel Hankinson, Lauren Pierce
P118724 WB Directions in Development 978-0-8213-8738-2	ECA	Outage | Investment Shortfalls in the Power Sector in Eastern Europe and Central Asia	Ani Balabanyan, Edon Vrenezi, Lauren Pierce, Denzel Hankinson
P114517	ECA	Transition to a Low-Emissions Economy in Poland	Erika Jorgensen, Leszek Kasek
P116227 WB Report No. 53963-GLB	Global	A New Slant on Slopes | Measuring the Benefits of Increased Electricity Access in Developing Countries	Margaret Wilson, John Besant Jones, Pierre Audinet
A World Bank Study 978-0-8213-8697-2	Global	Climate Impacts on Energy Systems | Key Issues for Energy Sector Adaptation	Jane Ebinger, Walter Bergara, Irene Leino
ESMAP Toolkit	Global	HEAT | Hands-On Energy Adaptation Toolkit	Jane Ebinger
ESMAP Two-Pager	Global	HEAT | Hands-On Energy Adaptation Toolkit	Vanessa Lopes
Energy and Mining Sector Board Discussion Paper No. 21	Global	Impacts of Transmission and Distribution Projects on Greenhouse Gas Emissions | Review of Methodologies and a Proposed Approach in the Context of World Bank Lending Operations	Marcelino Madrigal, Randall Spaldin-Fecher
P119673	Global	Issues Paper on Gender and Energy	Nilufar Ahmad, Mark Blackden, Megumi Makisaka, Vanessa Lopes, Koffi Ekouevi, Adriana Eftimie, Robert Bacon
P114056 WB Working Paper No. 204 978-0-8213-8534-0	Global	Mainstreaming Building Energy Efficiency Codes in Developing Countries | Global Experiences and Lessons From Early Adopters	Feng Liu, Anke S. Meyer, John F. Hogan
P109169 WB Working Paper No. 218 978-0-8213-8831-0	Global	National Oil Companies and Value Creation	Silvana Tordo, Brandon S. Tracy, Noora Arfaa
ESMAP Briefing Note 009/10	Global	Public Procurement of Energy Efficiency Services | Getting Started	Jas Singh, Dilip R. Limaye, Brian Henderson, Xiaoyu Shi
ESMAP Two-Pager	Global	Rapid Assessment Framework | A Practical Tool for Instituting Urban Energy Efficiency	Ranjan Bose
P115793 WB Report No. 57685	Global	Rapid Assessment Framework | An Innovative Decision Support Tool for Evaluating Energy Efficiency Opportunities in Cities	Ranjan Bose

ISBN, Pub. No., Or Project ID	Country/ Region	Title	Author(s)/PTL/Program
Energy and Mining Sector Board Discussion Paper No. 24	Global	Regulatory and Financial Incentives for Scaling Up Concentrating Solar Power in Developing Countries	Natalia Kulichenko, Jens Wirth
ESMAP Formal Report 339/11	Global	Tools for Improving Air Quality Management | A Review of Top-down Source Apportionment Techniques and their Application in Developing Countries	Todd M. Johnson, Sarath Guttikunda, Gary J. Wells, Paulo Artaxo, Tami C. Bond, Armistead G. Russell, John G. Watson, Jason West
Energy and Mining Sector Board Discussion Paper No. 26	Global	Transmission Expansion for Renewable Energy Scale-Up | Emerging Lessons and Recommendations	Marcelino Madrigal, Steven Soft
Consultant Report	India	Report on Barriers for Solar Power Development in India	Prepared by Ashish Kulkarni for Ashish Khanna, Gevorg Sargsyan, Natalia Kulichenko, Chandrasekeren Subramaniam, Anjali Garg, Ruchi Soni
P099005 A World Bank Study 978-0-8213-8780-1	India	Unleashing the Potential of Renewable Energy in India	Gevorg Sargsyan, Mikul Bhatia, Sudeshna Ghosh Banerjee, Krishnan Raghunathan, Ruchi Soni
P120587 WB Report No. 56849-SAS	SAR	Impact of the Global Financial Crisis on Investments in South Asia's Electric Power Infrastructure | The Experience of India, Pakistan, and Bangladesh	Mohua Mukherjee, Kumar V Pratap
P120983	Lao	Powering Up Productivity in Rural Lao PDR | Stimulating Small and Medium Enterprises to Use Electricity for Income Generation	Voravate Tig Tuntivate
P110201 WB Report No. 55418-LAC	LCR	Central America Regional Programmatic Study for the Energy Sector | General Issues and Options (English & Spanish)	Fernando Lecaros, Juan Miguel Cayo, Manuel Dussan
WB Report No. 63875 A World Bank Study	LCR	Electricity Auctions | An Overview of Efficient Practices	Luiz T. A. Maurer, Luiz A. Barroso
WB Directions in Development 978-0-8213-8208-0	LCR	Gender-Sensitive Approaches for the Extractive Industry in Peru | Improving the Impact on Women in Poverty and Their Families	Bernie Ward, John Strongman
P110201 WB Report No. 52106-LAC	LCR	Managing an Electricity Shortfall | A Guide for Policymakers (English & Spanish)	Pierre Audinet, Martín Rodriguez Pardina
WB Directions in Development 978-0-8213-8819-8	LCR	Meeting the Balance of Electricity Supply and Demand in Latin America and the Caribbean	Rigoberto Ariel Yépez-Garcia, Todd M. Johnson, Luis Alberto Andrés
P110201 WB Report No. 58934-LAC	LCR	Regional Power Integration | Structural and Regulatory Challenges (English & Spanish)	David Reinstein, Almudena Mateos, Alberto Brugman, Todd Johnson, Laura Berman

ISBN, Pub. No., Or Project ID	Country/ Region	Title	Author(s)/PTL/Program
P113684 WB Report No. 63218	MNA	Middle East and North Africa Region Assessment of the Local Manufacturing Potential for Concentrated Solar Power (CSP) Projects	Ernst & Young et Associés for Chandrasekar Govindarajalu, Philippe Roos, Fowzia Hassan
A World Bank Study 978-0-8213-8779-5	Nepal	Power and People | The Benefits of Renewable Energy in Nepal	Sudeshna Ghosh Banerjee, Avjeet Singh, Hussain Samad
ESMAP Special Report 007/10	Peru	Peru | National Survey of Rural Household Energy Use	Peter Meier, Voravate Tuntivate, Douglas F. Barnes, Susan V. Bogach, Daniel Farchy
P109969 ESMAP Formal Report 340/11	Peru	Peru Opportunities and Challenges of Small Hydropower Development	Peter Meier, Eduardo H. Zolezzi, Susan V. Bogach, Terence Muir, Karen Bazex
P118724 Consultant Report	Serbia	Outage | Power Sector Investment Shortfalls in Serbia	DHInfrastructure Economics & Finance, Inc.
ESMAP Briefing Note 008/11	South Africa	Best Practices for Market-Based Power Rationing | Implications for South Africa	Luiz Maurer
ESMAP Briefing Note 007/11	South Africa	Implementing Energy Efficiency and Demand Side Management | South Africa's Standard Offer Model	Dilip Limaye
P118724 Consultant Report	Urkraine	Outage | Power Sector Investment Shortfalls in Ukraine	DHInfrastructure Economics & Finance, Inc.
P120481	Vietnam	Report on Benchmarking Study on Urban Water Supply Utility Performance in Vietnam for the Period 2007–2009 (case study)	Feng Liu

World Bank Regions | **AFR** – Africa | **EAP** – East Asia and Pacific | **ECA** – Europe and Central Asia | **MNA** – Middle East and North Africa | **LCR** – Latin American and the Caribbean | **SAR** – South Asia

ACRONYMS

AAA	analytical and advisory activities
ABG	annual block grant
ACCI	Africa Clean Cooking Initiative
AEI	Africa Electrification Initiative
AFR	Africa (World Bank region)
AFREA	Africa Renewable Energy Access Program
AFTEG	Africa Energy unit (World Bank unit)
AMADER	Agence Malienne pour le Développement de l'Energie Domestique et de l'Electrification Rurale
AMC	advanced market commitment
AOSIS	Alliance of Small Island States
APEC	Asia Pacific Economic Cooperation
ASTAE	Asia Sustainable and Alternative Energy Program
AusAID	Australian Agency for International Development
BBL	brown bag lunch
BEIA	Biomass Energy Initiative in Africa
C	celsius
C40	C40 Cities Climate Leadership Group
CCDP	Climate Change for Developmental Professionals
CDKN	Climate and Development Knowledge Network
CDS	City Development Strategy
CEEDS	Cooperative Energy Efficiency Design for Sustainability
CEIF	Clean Energy Investment Framework
CESVA	Country Energy Sector Vulnerability Assessments
CG	Consultative Group
CIF	Climate Investment Funds
COP	Conference of the Parties
CSP	Concentrated Solar Power
DFID	Department for International Development (UK)
EAP	East Asia and Pacific (World Bank region)
EASP	Energy Assessments and Strategy Program
ECA	Europe and Central Asia (World Bank region)
ECOWAS	Economic Community of West African States
ECREEE	ECOWAS Regional Centre for Renewable Energy and Energy Efficiency
EE	energy efficiency
EECI	Energy Efficient Cities Initiative
EFFECT	Energy Forecasting Framework & Emissions Consensus Tool
EnDev	Energizing Development
ESMAP	Energy Sector Management Assistance Program
ESMED	Energy Small- and Medium-Sized Enterprise Development Strategies
EUEI-PDF	European Union Energy Initiative — Partnership Dialogue Facility
FY	fiscal year
GDP	gross domestic product
GEDS	Gender and Energy Development Strategies
GEF	Global Environment Facility
GIZ	Gesellschaft für Internationale Zusammenarbeit
GPOBA	Global Partnership on Output-Based Aid
GW	gigawatt
HEAT	Hands-on Energy Adaptation Toolkit
ICLEI	ICLEI — Local Governments for Sustainability
ICS	improved cook stoves
ICT	information and communication technology
IEA	International Energy Agency

IFC	International Finance Corporation
LCGS	Low Carbon Growth Country Studies
LCR	Latin America and the Caribbean (World Bank region)
LPG	liquified petroleum gas
M&E	monitoring and evaluation
MACTool	Marginal Abatement Cost Tool
MEDEC	México: Estudio sobre la Disminución de Emisiones de Carbono
MNA	Middle East and North Africa (World Bank region)
MRD	mobile retail dealer
MW	megawatt
NOC	national oil company
OECD-DAC	Development Assistance Committee of the Organization for Economic Cooperation and Development
OPVA	Oil Price Vulnerability Assessments
PEA-TAP	Pro-Poor Energy Access Technical Assistance Program
PGE	Pertamina Geothermal Energy
PPP	public-private partnerships
PREM	Poverty Reduction & Economic Management Network (World Bank unit)
PSVA	Power Sector Vulnerability Assessments
PTL	program team leader
PV	photovoltaic
RBF	results-based funding
RE	renewable energy
REEEP	Renewable Energy and Energy Efficiency Partnership
REISP	Regional Energy Integration Strategies Program
REMTI	Renewable Energy Market Transformation Initiative
RREA	Rural and Renewable Energy Agency
SAR	South Asia (World Bank region)
SDN-VP	Sustainable Development Network (World Bank Vice Presidential unit)
SIDA	Swedish International Development Cooperation Agency
SIDS	Small Island Developing States
SSA	Sub-Saharan Africa
SWAp	Sector-Wide Approach
TA	technical assistance
TAG	Technical Advisory Group
TAMT	Transportation Activity Measuring Toolkit
TRACE	Tool for Rapid Assessment of City Energy
UN	United Nations
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Organization
WB	World Bank
WBI	World Bank Institute
WDR	World Development Report

The International Bank for Reconstruction
and Development/THE WORLD BANK GROUP
1818 H Street, N.W.
Washington, D.C. 20433, U.S.A.

Manufactured in the United States of America
First printing April 2012

Production Credits
Task Leader | Nicholas Keyes
Production Editor | Heather Austin
Design | Patricia Hord Graphik Design
Reproduction | Automated Graphic Systems, Inc.

Photo Credits
Cover | William James Warren/Science Faction/© Corbis
Inside Front Cover | Lighting Africa /© World Bank
p. ii | Egill Árni Guðnason /© Iceland GeoSurvey
p. 5 | Arne Hoel/© World Bank
p. 8 | Markel Redondo/© Panos
p. 10 | Debbie Mous/© stock.xchng
p. 15 | Philippe Ross/© Flickr
p. 16 | Petr Kovar/© stock.xchng
p. 18 | © Panos
p. 20 | A. Valencia/© World Bank
p. 24 | Arne Hoel/© World Bank
p. 25 | Simone McCourtie /© World Bank
p. 26 | John Hogg/© World Bank
p. 28 | Alessandro Paiva/© stock.xchng
p. 30 | © shutterstock.com
p. 33 | José A. Warletta/© stock.xchng
p. 34 | Dirk Ott/© shutterstock.com
p. 35 | Yuri Kozyrev/© World Bank
p. 36 | © stock.xchng
p. 39 | Marco Ariesen/Mediadam/© stock.xchng
p. 41 | Jan S./© shutterstock.com
p. 42 | Jonathan Ernst/© World Bank
p. 43 | Dana Smillie/© World Bank
p. 44 | Charlotte Kesi/© World Bank

www.esmap.org

Energy Sector Management Assistance Program
The World Bank
1818 H Street, NW
Washington DC 20433 USA
Fax: 202.522.3018 **Email:** esmap@worldbank.org