USAID
FROM THE AMERICAN PEOPLE

FULFILLING OUR COMMITMENT TO CLEAN ENERGY

Promoting Clean and Efficient Energy Technology in Developing Countries

Fiscal Years 2008–2010

August 2011

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Cover Photo
Solar energy lights up streets and community centers in remote communities on the island of Mindanao, in the Philippines.

Photo by Rosa May Maitem

http://www.usaid.gov/our_work/economic_growth_and_trade/energy/

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ABOUT THIS REPORT

The United States Agency for International Development (USAID) prepared this report in response to Title IX, Subtitle A of the Energy and Energy Independence and Security Act of 2007 (see Annex). Subtitle A directs USAID to report to Congress on USAID assistance for promoting clean and efficient energy technologies in developing countries in fiscal years 2008–2012.

The report summarizes USAID's investments and programs in clean energy for fiscal years 2008 through 2010. The funding figures presented are based upon actual obligations and budget commitments reported by USAID operating units around the world. The report covers country, regional, and centrally funded programs in Africa, Asia, Europe and Eurasia, Latin America and the Caribbean, and the Middle East.

The report describes USAID assistance for promoting clean and efficient energy technologies in developing countries to:

- Produce the necessary market conditions for the private sector delivery of energy and environmental management services
- Create an environment that is conducive to accepting clean and efficient energy technologies that support the overall purpose of reducing greenhouse gas emissions, including efforts to:
    - Improve policy, legal, and regulatory frameworks
    - Increase institutional abilities to provide energy and environmental management services
    - Increase public awareness and participation in the decision-making of delivering energy and environmental management services
- Promote the use of American-made clean and efficient energy technologies, products, and energy and environmental management services

USAID is frequently asked by Congress about the breakout of clean energy spending into the following categories: renewable energy, energy efficiency, energy sector reform and enabling environment, transmission and operating systems, gas flaring mitigation, biomass and biofuels. A breakdown of the different clean energy activities into subsectors is presented as follows:

Clean Energy Subsectors

- Photovoltaic (PV) systems, solar thermal power, wind, tidal, geothermal, hydro (micro-hydro)

- Building code and appliance standards with strict efficiency requirements, assessments of energy use patterns, and opportunities for more energy efficient practices and technologies
- Combined-heat-and-power production (CHP), i.e. cogeneration
- Demand Side Management (DSM) programs
- Fuel efficient stoves

- Projects that build a regulatory environment increasing transparency, accountability and predictability
- Policies protecting the interests of consumers and investors and providing incentives for energy sector utilities to improve the efficiency of operations and the quality of service, ideally leading to an attractive climate for public and private sector investment capital
- Electricity distribution reform, including reforms of electricity and gas distribution systems and utilities that result in significant reduction of losses and increase in revenues
- Market development and promotion, including monitoring, reporting and verification (MRV) systems
- Enhancing capacity to develop and implement Low Emission Development Strategies (LEDS)

- Projects that are specifically designed for the evacuation, transportation and trade in renewable energy
- Projects that are intended to significantly improve the performance and reduce losses of electricity and gas distribution utilities, if they are integral to a GHG emissions reduction plan
- Regional power pools that improve access to clean energy through regional electricity trade exchange

- Electricity generation and gas transmission infrastructure projects using gas that would otherwise be flared or vented. (These are classified as clean energy due to the exceptional greenhouse gas reductions involved.)

- Conversion of biomass, municipal solid waste or anaerobic digestion to power, liquid fuels, gas or bio-products

FULFILLING OUR COMMITMENT TO CLEAN ENERGY

USAID supports clean and efficient energy technology in 45 countries around the world. Between Fiscal Years 2008 through 2010, the Agency obligated approximately $280.3 million in appropriated funds to promote clean energy and efficient energy technology in developing countries. The vast majority of funds were distributed by USAID's overseas Missions, as described in the chapters that follow on Africa, Asia, Europe and Eurasia, Latin America and the Caribbean, and the Middle East.

Fiscal Years 2008–2010 Budget Obligations and Trends

USAID's clean energy obligations by country, operating unit or regional mission for Fiscal Years 2008–2010 are shown in Table 1. USAID's total obligations for clean energy for Fiscal Years 2008–2010 are provided in Figure 1.

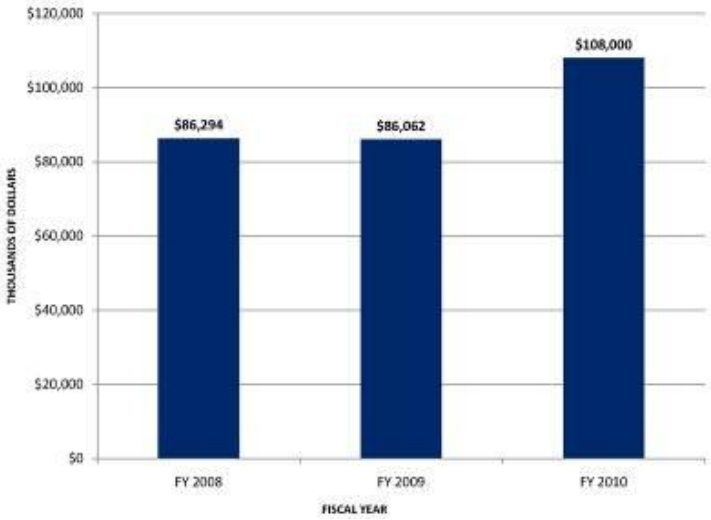
Table 1: USAID Obligations for Clean Energy for Fiscal Years 2008–2010.

	FY 2008	FY 2009	FY 2010	FY 08–10
Africa	$9,550	$9,800	$23,550	$42,900
Democratic Republic of the Congo	$500	$0	$2,000	$2,500
Kenya	$250	$500	$1,500	$2,250
Liberia	$3,000	$3,000	$1,000	$7,000
Mozambique	$0	$0	$2,000	$2,000
Sudan	$1,800	$1,800	$0	$3,600
Uganda	$0	$0	$1,500	$1,500
USAID Africa Regional (AFR)	$2,400	$2,400	$5,700	$10,500
USAID East Africa Regional	$0	$500	$2,750	$3,250
USAID Southern Africa Regional	$300	$300	$3,200	$3,800
USAID West Africa Regional	$1,300	$1,300	$3,900	$6,500
East Asia and Pacific	$4,400	$10,250	$20,750	$35,400
China	$0	$0	$2,600	$2,600
Indonesia	$0	$5,000	$5,000	$10,000
Mongolia	$50	$500	$1,500	$2,050
Philippines	$1,850	$2,250	$4,000	$8,100
USAID Regional Development Mission-Asia (RDM/A)	$2,500	$2,500	$7,650	$12,650
Europe and Eurasia	$24,610	$16,342	$18,682	$59,634
Albania	$500	$460	$400	$1,360
Armenia	$8,550	$500	$500	$9,550
Georgia	$3,010	$3,500	$3,000	$9,510
Kosovo	$6,300	$6,286	$782	$13,368
Macedonia	$0	$500	$500	$1,000
Moldova	$400	$0	$0	$400
Russia	$250	$0	$0	$250
Ukraine	$4,500	$3,000	$3,500	$11,000
Eurasia Regional	$1,100	$1,150	$10,000	$12,250
Europe Regional	$0	$946	$0	$946
Middle East	$0	$10,000	$3,250	$13,250
Jordan	$0	$10,000	$3,250	$13,250
South and Central Asia	$38,578	$32,504	$17,268	$88,350
Afghanistan	$29,600	$17,300	$0	$46,900
Bangladesh	$2,000	$2,743	$3,000	$7,743

Table 1: USAID Obligations for Clean Energy for Fiscal Years 2008–2010 (Cont.).

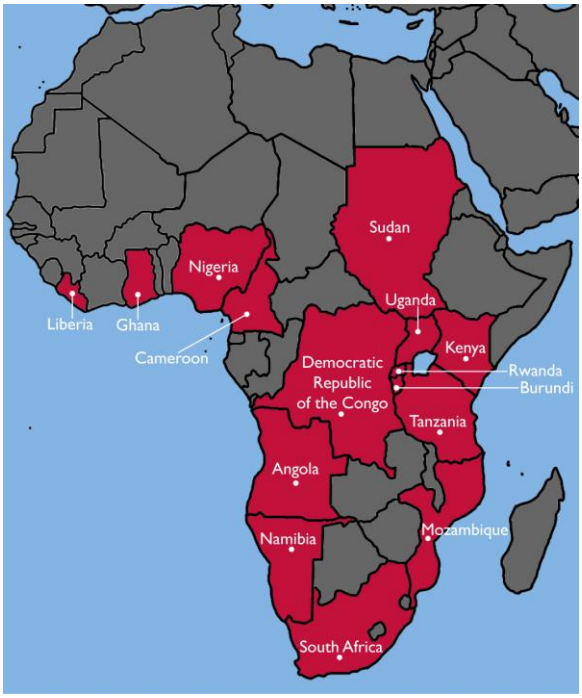
	FY 2008	FY 2009	FY 2010	FY 08–10
India	$550	$1,000	$5,000	$6,550
Kazakhstan	$627	$491	$250	$1,368
Kyrgyzstan	$1,145	$1,083	$1,500	$3,728
Pakistan	$0	$5,000	$0	$5,000
Tajikistan	$894	$1,142	$900	$2,936
Turkmenistan	$112	$190	$0	$302
Uzbekistan	$0	$120	$0	$120
Central Asia Regional	$950	$735	$4,618	$6,303
USAID South Asia Regional	$2,700	$2,700	$2,000	$7,400
Latin America and Caribbean	$700	$3,200	$10,000	$13,900
Brazil	$0	$3,000	$0	$3,000
Colombia	$0	$0	$2,000	$2,000
Honduras	$200	$200	$0	$400
Mexico	$500	$0	$3,000	$3,500
State Western Hemisphere Regional (WHA)	$0	$0	$0	$0
USAID Central America Regional	$0	$0	$5,000	$5,000
Asia Middle East Regional	$275	$0	$1,500	$1,775
Asia Middle East Regional	$275	$0	$1,500	$1,775
EGAT - Economic Growth Agriculture and Trade	$4,181	$3,966	$13,000	$21,147
USAID Economic Growth, Agriculture and Trade (EGAT)	$4,181	$3,966	$13,000	$21,147
ODP - Office of Development Partners	$4,000	$0	$0	$4,000
USAID Office of Development Partners (ODP)	$4,000	$0	$0	$4,000
TOTAL	$86,294	$86,062	$108,000	$280,356

Figure 1: USAID Obligations for Clean Energy for Fiscal Years 2008–2010.



AFRICA

USAID obligated approximately $42.9 million to clean energy projects for the Fiscal Years 2008–2010 in Africa through bilateral and regional programs. Countries assisted through the central Africa Bureau and regional program funds include Angola, Burundi, Cameroon, Ghana, Kenya, Lesotho, Liberia, Mozambique, Namibia, Nigeria, Rwanda, South Africa and Uganda. Countries assisted through bilateral program funds include the Democratic Republic of Congo, Liberia, Kenya, Mozambique, Sudan, Tanzania, and Uganda.



AFRICA BUREAU

AFRICA INFRASTRUCTURE PROGRAM

A key initiative of USAID's Africa Bureau is the African Infrastructure Program (AIP). AIP provides both short- and longer-term technical and capacity building assistance primarily to governments supporting the planning, due diligence, negotiation and implementation of clean energy (CE) projects in sub-Saharan Africa (SSA). AIP aims to create an attractive investment climate for CE projects by focusing on policy, regulatory, legal, and government capacity barriers. It currently supports more than 11 CE initiatives in SSA, including wind, solar, micro-hydro, geothermal, energy efficiency, and gas flaring mitigation where it is helping governments establish a receptive enabling environment for CE private investment and/or address the commercial and financial structuring of CE projects. The five-year program, launched in September 2008, is expected to add at least one gigawatt of new generation capacity and leverage more than $1 billion in new investments in a region where less than 28 percent of the population has access to commercial energy.

USAID REGIONAL MISSION PROGRAMS

USAID has three Regional Missions offices supporting the sub-Saharan region located in Pretoria, Accra and Nairobi. USAID/Southern Africa is assisting the Southern African Development Community (SADC) member states and the Regional Electricity Regulators Association in undertaking policy, legal, energy planning, and regulatory reforms that improve and promote energy efficiency and clean energy use within the region. Having played a key role in the establishment and support of the Southern Africa Power Pool, USAID/Southern Africa in FY 2010 supported the promotion of renewable energy technologies within the Southern African region. These activities are particularly relevant to countries in southern Africa, especially South Africa, which have rapidly growing economies that might otherwise continue to rely on the use of carbon-based fuels.

USAID/West Africa began a new, multi-year program in FY 2010 that focuses on achieving the reduction of carbon emissions by promoting energy efficiency, cleaner forms of energy production, and by strengthening regional institutions supporting clean energy. The Mission actively supports the Economic Community of West African States (ECOWAS) which will be playing an increasingly key role in expanding the reliable supply of electricity from renewable energy production and system efficiencies. ECOWAS also has a strong history of being a key supporter in the creation and implementation of the emerging West Africa Power Pool. Through this support, it will help play a key role in facilitating the production and transmission of cleaner sources of energy – such as the ample hydropower that exists in eastern parts of the region.

USAID/East Africa is supporting the establishment and development of the newly formed, East Africa Power Pool (EAPP). The EAPP will be playing a critical role in linking sources of clean energy–such as the currently remote, yet abundant sources of hydropower, geothermal, and wind power–to the main electricity demand centers in several East African countries.

Country programs supported with Africa Bureau central or Regional Bureau funds are described below.

CAMEROON

Improve Market Environment and Penetration of Renewable Energy

USAID's AIP is currently implementing a three-tiered program of reform proposing the introduction of a revenue cap tariff system, improvement of regulatory controls and systems in preparation for clean energy Independent Power Producers (IPPs), and the development of design contracts for power connection and transmission services. It is also assisting in the renegotiation of the Framework Concession License Agreement, all of which will play a key role in facilitating Cameroon's ability to develop its hydro resources. Once these reforms are implemented, Cameroon can leverage new power sector investments, largely through clean energy sources.

GHANA

Improve Policy Frameworks and Market Creation for Flared Gas

In FY 2010, USAID/Ghana and AIP supported the government's goal to generate cleaner power by using previously flared natural gas for fuel. USAID assistance continues to build upon the government's capacity to develop gas laws, policies, and regulations; mitigate or reduce associated gas-flaring; and plan strategically to create a sustainable gas sector with surplus revenue to reinvest in clean energy generation.

In both FY 2009 and FY 2010, USAID also supported Ghana's national power transportation company, Grid Company of Ghana, on two proposed projects which plan to use previously flared natural gas associated with oil drilling operations offshore of both Ghana and Nigeria. These two projects will result in the installation and creation of 552 MW of new electricity demand, markets for previously flared gas, leveraging approximately $700 million in new investments, while reducing greenhouse gas (GHG) emissions by 1.7 million tons of carbon dioxide (CO_2) per year. These two plants will displace existing oil fired electricity generation plants and a very large number of smaller diesel generating plants currently in existence in Ghana.

LESOTHO

Improve Enabling Environment and Advancement of Wind Energy Projects

USAID is supporting a capacity building and transaction support program to the Lesotho Electricity Company (LEC) where it is enhancing the country's regulatory environment and improving the ability of LEC and other government agencies to evaluate, negotiate, and integrate wind energy projects into the country's national power grid. It is also assisting the government in its negotiation of the commercial aspects of the first wind energy project proposed in the country. The program will alleviate Lesotho's current dependence on a single electricity plant and help displace the 20 percent of mostly fossil-based electricity that is currently imported into the country from South Africa.

NAMIBIA

Clean Energy Capacity Building and Project Support

AIP is supporting capacity building and transaction support services to Namibia's Electricity Control Board (ECB) for the establishment of a framework and enabling environment to attract private sector investments in clean energy technologies. It is providing information on international best practices in the relatively new field of renewable energy integration. AIP is assisting the ECB and Namibia's national power utility, Nampower, in their negotiations with wind farm developers, and in their preparation of low-carbon development strategies to encourage the production of renewable energy. If implemented, benefits from these wind farms can result in 100 MW of new renewable energy capacity and hundreds of new jobs, as well as the displacement of 200,000 tons per year of carbon dioxide equivalent (CO_2e) generation.

NIGERIA

Promote Climate Change Mitigation

In FY 2010, USAID supported the Nigerian Energy and Climate Change (NECC) project for clean energy, energy conservation, and energy efficiency work. The project enhanced the private sector's capacity to participate in the development of clean energy. The project also worked with the Nigerian Electricity Regulatory Commission to set tariffs that

encourage efficient energy use, supporting new entrants in power generation, local renewable generation, and transmission capacities. In addition, institutional, legal, and regulatory frameworks were improved to promote efficient operations among generation, distribution, and transmission companies. The NECC project also promotes rural electrification and the use of efficient wood stoves in southeastern and northern Nigeria to reduce deforestation and resulting desertification.

RWANDA

Improved Market Conditions

Rwanda is one of the most densely populated countries in Africa, but it has one of the lowest electrification rates at only 6 percent of the population. AIP is reviewing all forms of renewable generation to suggest ways Rwanda can expand its electricity resources so as to reach Rwanda's largely underserved population. Rwanda has hundreds of potential micro-hydropower sites that could double the country's generating capacity and expand electrification to 35 percent of the population in 10 years. AIP is currently conducting a comprehensive assessment of the necessary tariff structure for renewable energy sources from micro-hydropower, solar, geothermal, and wind; and it is assisting the government of Rwanda in applying the structure to the power purchase agreements with the first group of micro-hydropower projects. This Renewable Energy Feed in Tariff framework, once in place, will encourage significant private sector investment. The program will help promote the development of clean energy, increase electricity penetration, and avoid the creation of up to 500,000 tons of CO2e while creating jobs through an expansion of the economy.

Photo by: Walt Ratterman, Sunepil

Training workers to properly install solar panels at health clinics in Rwanda provides clean energy and creates green jobs.

SOUTH AFRICA

Improve Private Sector Investment Environment and Renewable Energy Market Penetration

USAID's AIP is supporting the South African Department of Energy and the National Electricity Regulator of South Africa to address structural issues in the country's electricity sector and, by virtue of South Africa's role as a key regional off-taker, in the broader Southern Africa region. USAID is assisting in the development of an Integrated Resource Plan and policies and regulations that will encourage private investment and maximize the market penetration of clean energy technologies into the country's national generation plan. AIP is recommending policies to be adopted by the National Treasury to support private sector development into the sector by Independent Power Producers.

USAID COUNTRY PROGRAMS

KENYA

Develop Capacity to Advance and Negotiate Wind and Renewable Energy Projects

In FY 2010, USAID supported a new clean energy program in Kenya involving a range of activities, including biogas, solar and wind energy, fuel-efficient stoves, sustainable charcoal harvesting policies, and biomass energy from agricultural residue.

In addition, USAID is currently providing critical capacity building to the newly-formed Government of Kenya- owned Kenya Electricity Transmission Company Limited (KETRACO). This capacity building assistance is combined with additional transaction advisory assistance that will allow KETRACO to successfully negotiate its commercial obligations on a new 470 km transmission line associated with the remote, privately-owned and constructed 300 MW Lake Turkana Wind Power (LTWP) project in northwestern Kenya. In addition, once this transmission line is constructed and operating, its development will significantly stimulate the development and construction of other renewable energy and geothermal energy plants located along its path in the Great Rift Valley, which is rich in geothermal energy. The LTWP project adds new renewable capacity equal to 25 percent of Kenya's current generation capacity; helps meet its electricity needs from new sources of renewable energy; and has the potential to displace at least 650,000 tons per year of CO2e generation.

LIBERIA

Improve Policy Implementation

USAID supported the development and implementation of a National Energy Policy to set a clear direction to encourage private investment in clean energy. In the next few years Independent Power Producers should be established in Liberia, increasing electricity for the country and enabling the country to attract private investment. USAID supports the establishment of commercial guidelines to govern the commercialization process of the Liberia Electricity Corporation (LEC) as a financially viable and independent utility.

Promote Climate Change Mitigation

In FY 2008, USAID completed the installation of solar energy system pilots, serving more than 30,000 people. USAID-funded technical studies supported the expanded use of renewable energy, particularly bioenergy and micro-hydropower.

In 2010, the new Liberia Energy Sector Support Program analyzed potential renewable resources such as micro- and mini-hydropower, wind energy and biomass, and opportunities for energy efficiency improvements. Liberia's abundance of water, sunshine, and sources of biomass hold great potential for producing clean and renewable power.

MOZAMBIQUE

Wind Energy Capacity Building

USAID's AIP is providing capacity building to Mozambique's Ministry of Energy, helping it to establish a regulatory framework and to integrate the country's first wind energy generation project into its existing hydro-dominated power system. USAID assistance focuses on building local capacity to solicit and evaluate proposals for new renewable energy development, establish an appropriate regulatory framework and tariff structure, and provide assistance in the negotiation of key commercial contracts such as power purchase agreements. The immediate benefit of this program is to facilitate the government structuring of current projects on the coastal Inhambane and Ponta d'Ouro wind sites, which will constitute Mozambique's first wind Independent Power Producers, each with 30 MW of capacity. Implementation of these projects will lead to a potential reduction of the 140,000 tons per year of CO2 emissions and the creation of hundreds of primary and secondary jobs.

"Our future is what we build it to be. The jobs and industries of the 21st century will be centered around clean renewable energy."

President Barack Obama

UGANDA

Promote Climate Change Mitigation

In FY 2010, USAID supported the replacement of diesel-powered water pumps in northern Uganda with solar-powered systems, especially at USAID-supported schools and health centers.

ASIA

The Asia region is home to three of the world's largest emitters of greenhouse gases–China, Indonesia and India. USAID's focus in Asia is on creating more reliable and affordable energy services from clean energy technologies. USAID is proactively engaging in-country stakeholders and tailoring its clean energy investments to address the diversity of circumstances and capacities that exist within the region.

To improve transparency, inclusiveness and accountability in policy and regulation of the electricity sector, USAID is emphasizing the importance of good governance when it makes its investments in clean energy, working with civil society, policymakers and regulators across Asia.

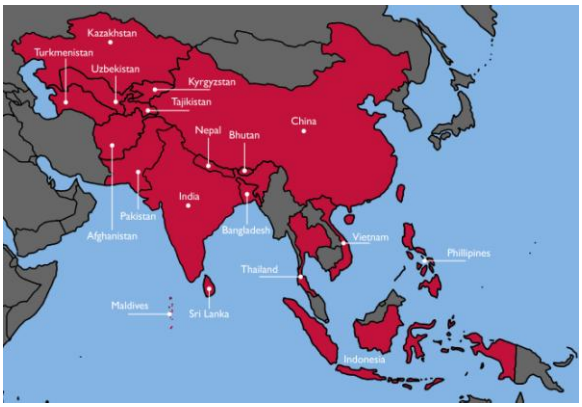
USAID is helping Asian countries not only develop clear and consistent policies to promote clean energy, but also processes that allow these countries to adapt and improve policy over time while providing the necessary level of predictability to investors. New wind and solar investments in Asia are closely tied to support from government policies. World Resources Institute research shows that when strong and predictable incentives for clean energy are in place, investments increase. Conversely, when incentives expire or are canceled, clean energy investments collapse.

Through the Private Financing Advisory Network (PFAN), USAID is also working to unleash the potential of entrepreneurs to focus on renewable energy technologies in Asian countries where there is potential for scale up, availability of credit, and clear policies to encourage clean energy. This work will be discussed under the Global Climate Change section.

USAID is also supporting the financing and scaling up of small, medium, and micro enterprises (SMMEs) in the renewable energy sector to fight energy poverty and increase access to clean, modern energy services. More than a billion people in Asia lack access to clean energy. Through financial intermediary partners in the region, USAID is helping to lower perceived risks around SMMEs and clean energy, through partial loan guarantees to debt funders or patient (long-term) capital to equity funders.

USAID obligated $123.75 million in the Fiscal Years 2008–2010 for clean energy activities in 19 countries in Asia through bilateral and regional programs. Countries assisted with regional program funding include Bhutan, Sri Lanka, Maldives (through the South Asia Regional Initiative); Nepal, Turkmenistan and Uzbekistan (through the Central Asia Regional Program); and China, India, Indonesia, Philippines, Thailand, and Vietnam (through the Regional Development Mission in Asia).

Countries assisted through bilateral programs in Fiscal Years 2008–2010 include Afghanistan, Bangladesh, China, India, Indonesia, Kazakhstan, Kyrgyzstan, Pakistan, Philippines, Tajikistan, and Vietnam.



USAID REGIONAL MISSION PROGRAMS

ENVIRONMENTAL COOPERATION-ASIA CLEAN DEVELOPMENT AND CLIMATE PROGRAM

USAID, through its Environmental Cooperation-Asia Clean Development and Climate Program (ECO-Asia CDCP), seeks to reduce energy demand and associated greenhouse gas emissions while improving energy security through targeted assistance, training, and enhancing regional cooperation and knowledge-sharing among its partners in China, India, Indonesia, the Philippines, Thailand, and Vietnam. The ultimate goal of the program is to promote significant scale-up of clean energy production to mitigate GHG emissions. Program activities include promoting energy efficient lighting through the harmonization of standards and increased market adoption; leveraging small-scale clean energy investment; stimulating demand-side energy efficiency financing; promoting

clean energy and energy efficiency policy dialogue in the region; and promoting knowledge-sharing on clean energy. The program is managed by the USAID Regional Development Mission for Asia (RDMA), based in Bangkok.

Energy Efficient Power Generation
During FY 2009, RDMA secured commitments to finance major efficiency improvements in three coal-fired power plants in India, leading to an estimated reduction of seven million metric tons of carbon dioxide emissions over the lifetimes of the plants. USAID helped its Indian partners acquire loans and grants of more than $30 million from the World Bank and Indian sources for significant efficiency improvements, creating a model for replication in India and across Asia. (Note: USAID/RDMA no longer supports energy efficiency work in fossil-based power generation, as a result of changes to the clean energy earmark.)

Knowledge-Sharing
RDMA supports knowledge-sharing to facilitate the scale-up of clean energy policies and investments. During FY 2008, USAID launched a regional website for clean energy practitioners, www.cleanenergyasia.net, and continued its partnership with the Asian Development Bank (ADB) throughout the FY 2008-2010 period. ADB and USAID co-organized annual Asia Clean Energy Forums, the leading event for clean energy practitioners in Asia, attended by more than 500 energy officials and experts from 40 countries each year.

During FY 2010, USAID trained more than 2,000 clean energy professionals (28 percent were women) in technical and policy issues relating to global climate change, and leveraged $2,627,170 in cost-shared funds from non-USAID sources for capacity-building and institutional development activities.

During FY 2009–2010, USAID also produced detailed studies on Biofuels in Asia, Black Carbon Emissions in Asia, and various technical issues associated with energy efficient lighting, clean energy financing, and cleaner coal power generation in Asia.

SOUTH ASIA REGIONAL INTEGRATION PROGRAM

Promote Energy Security
The USAID South Asia Regional Integration Program for Energy (SARI/E) promotes energy security in South Asia through three activity areas: cross-border energy trade; energy markets; and clean energy access partnerships. Through these activities, USAID facilitates more efficient regional energy resource utilization, mitigates environmental impacts of energy production, and increases regional access to energy resources. SARI/E countries include: Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka.

Build Public Understanding and Support
In addition to catalyzing clean energy trade, improved regional energy markets enhance energy efficiency, rural energy supply, energy regulation, and private sector involvement–all important goals for sustainably reducing carbon emissions over the long term. The network of energy sector professionals in Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka, created by SARI/E, has led to widespread sharing of best practices, models of institutional reform and restructuring, and documented performance improvement. These professionals are helping to lay the foundation for more robust regional trade and sustainable economic development.

Improve Market Conditions
In FY 2008, in India, SARI/E assisted the launch of a nationwide power exchange that serves as a clean energy trading platform.

With FY 2010 resources, USAID, through SARI/E, provided technical assistance for cross-border power projects between India-Sri Lanka, India-Bangladesh, and Central Asia-South Asia. The program funded executive exchange events to build the capacity of South Asian executives in the areas of transmission, renewable generation, energy efficiency, and clean technologies. The program also targeted institution-building through the establishment of four regional climate innovation centers to advance clean energy development.

FY 2010 funds also encouraged the creation of market mechanisms necessary for trading in energy. Work with policy makers has led to regional energy cooperation through the enhancement of national policies and international agreements. Outcomes include increased growth and improved regional

security and stability. Activities will build upon the energy sector reform process already underway in most countries; and will work with governments, the private sector, and civil society groups to foster regional cooperation through cross-border dialogue.

REGIONAL ENERGY MARKETS ASSISTANCE PROGRAM–CENTRAL ASIA

Improve Market Conditions

In FY 2010, USAID supported the Regional Energy Markets Assistance Program to engage several Central Asian countries, including Afghanistan, Kyrgyzstan and Tajikistan, in creating an institutional framework for regional trade in electric power. An integrated regional power market will draw energy from plants with the lowest energy production costs before plants with higher costs. An integrated market creates more favorable conditions for new energy generation, including the largely untapped hydroelectric potential of Kyrgyzstan, which can replace more expensive and carbon-intensive, thermal energy generation. The program also supports a review of domestic power sector reform priorities, including regulatory reform and commercialized power distribution. A tariff structure reflecting the true cost of energy will lead to more efficient energy use, reducing demand and overall greenhouse gas emissions.

THE REGIONAL CENTER FOR ENERGY EFFICIENT LIGHTING

The Regional Center for Energy Efficient Lighting (RCEEL) is highlighted as an energy efficiency success story for South Asia on page 33 of this report.

USAID COUNTRY FUNDED PROGRAMS

AFGHANISTAN

Increasing energy access

USAID is working on increasing access to electricity, a top priority for Afghans. USAID coordinated donor efforts to build the North East Power System (NEPS) for exporting low cost electricity from Uzbekistan to Kabul and other major Afghan cities. USAID also rehabilitated two turbines at the Kajaki hydropower facility, doubling the generation capacity of the dam.

Enabling Environment

A key component of the U.S. energy strategy is capacity-building of Afghans working in the power sector. USAID has actively supported power sector reform and the commercialization of electricity distribution. The United States and other donor agencies achieved a major milestone in September 2009, when the Afghan Government officially launched Da Afghanistan Breshna Sherkat (DABS), a new commercialized Afghan electrical utility. Within the next few years, it is hoped that DABS will grow into a strong and viable commercial entity that can reduce electricity losses, increase revenue flow, and improve service delivery to millions of consumers.

Renewable Energy

In 2008, through SARI/E, wind and solar energy resource assessment maps were completed.

The Afghan Clean Energy Project (ACEP), started in FY 2009, aims to foster energy independence and development through increased use of renewable energy, increased energy efficiency, and establishment of a local renewable energy equipment and service industry. The ACEP has supported two clinics powered by solar electricity, and two solar-electrified schools. Between 2009 and 2013, USAID will assist over 300 rural communities in gaining access to clean technology to power their homes, schools, and businesses through clean, renewable energy, such as micro-hydropower, solar, and wind projects.

BANGLADESH

Improve Regulatory Capacity

Bangladesh's energy sector faces a crisis resulting from severe power shortages, skyrocketing natural gas consumption, and rural energy poverty. This issue is exacerbated by problems of mismanagement, low energy prices, and a weak regulatory environment which significantly compromise the financial viability of the energy sector and provide little incentive for investment in energy efficiency and renewable energy sources.

Under the current USAID/Bangladesh Improved Capacity for Energy Access program, substantial support has been provided to improve the operational capacity of the Bangladesh Energy Regulatory Commission (BERC). BERC has a continuing need for capacity building in areas such as tariff setting, energy efficiency, renewable energy, and the creation of an electricity market. In FY 2010, USAID supported reforms in energy regulations to help establish the critical market preconditions for developing and deploying clean energy resources and technologies.

CHINA

China's rapid economic expansion has led to severe environmental problems, many of which have global or transnational impacts, including climate change and energy security. U.S.-China environment partnerships are effective and important means of collaborating on priority environmental issues. USAID/RDMA supports a range of clean energy-related activities under Congressional earmark funding for China.

Increasing Institutional Abilities

Key achievements in FY 2008 included: increasing the capacity of academic, public, and private institutions in environmental monitoring and management; training more than 1,000 people in environmental/energy policy and law; and strengthening the institutional capacity of 19 agencies.

Promote Climate Change Mitigation

The U.S.-China Energy Efficiency Alliance assisted in the development of a national demand side management implementation manual in 2008, prepared for China's State Power Grid Corporation under the direction of the National Development and Reform Commission. The program summarized best practices from the United States and China on financing mechanisms for DSM and energy efficiency to improve transparency and accountability over current practices. In 2009, USAID's Guangdong Environmental Partnership GDA launched China's first Environment, Health and Safety Academy; initiated training for hundreds of manufacturers; and began support for a new air emissions trading platform in partnership with U.S. EPA. In 2010, the program worked to increase environmental accountability through partnerships while reducing GHG emissions and energy demand. The USG trained more than 1,300 industry managers through its Environment, Health, and Safety (EHS) Academy in energy efficiency and environmental management, and worked closely with government counterparts to establish China's first EHS professional certification program.

USAID's U.S.-China Sustainable Buildings Partnership GDA promoted sustained and achievable reductions in building energy use and GHG emissions in China through support for efficiency governance. In FY 2009, the program collaborated with several large U.S. and Chinese companies and property associations, representing 1,139 buildings, to reduce energy consumption and associated greenhouse gas emissions. During FY 2010, the USG partnered with 4,485 buildings, trained 1,005 building managers and owners on green building practices and policies, developed 16 information tools, and three new technologies for building energy efficiency. These efforts reduced annual energy use by 286 million kWh and annual emissions by 242,742 metric tons of CO2e.

In FY 2010, USAID's U.S.-China Partnership for Climate Action GDA promoted GHG emission reductions and energy efficiency in industry, the power sector, and in Jiangsu and Guangdong provinces. The program developed GHG and energy efficiency coursework and accounting tools for industries; and supported new incentive programs and capacity building for investors, policymakers, and energy services companies on energy efficiency project aggregation and financing.

During FY 2010, using China's earmark funding, RDMA supported innovative financing to accelerate investments in energy efficiency. RDMA worked with the Hebei Fakai Energy Service Company to scale up its capacity to facilitate its first three energy efficiency retrofits, a total investment by the Chinese firm of $1.5 million. This investment will reduce energy demand by 600 MW and avoid greenhouse gas emissions amounting to 156,000 metric tons of CO2e over 15 years.

INDIA

Promote Climate Change Mitigation

USAID obligated $10 million in clean energy funding in FY 2010 in two new bilateral programs. A total of $5 million was obligated under the Partnership for Energy Efficiency Technology Commercialization and Innovation Program with the Ministry of Power. An additional $5 million was obligated in the Partnership for Renewable Energy Technology Commercialization and Innovation Program with the Ministry of Renewable Energy. Combined, the two programs constitute a new and innovative, multi-million dollar U.S.-Indo partnership over the next five years. The agreements will finance projects that improve the enabling environment to deploy clean energy technologies, increase financing, and improve institutional and human capacity to implement clean energy programs in India.

INDONESIA

Build Public Support and Understanding

In FY 2010, USAID analyzed the primary barriers to clean energy development in Indonesia. USAID supported policy development and governance, as well as campaigns and training to increase awareness about energy sector reform and climate change concerns among national and sub-national government officials, financial institutions, project developers, and the general public. USAID is also working with small-scale independent power producers to harness renewable, efficient energy.

Photo by: USAID

Promoting rapid mass transit keeps cars off the road and mitigates greenhouse gas emissions in Jakarta, Indonesia.

KAZAKHSTAN

Improve Market Conditions

In FY 2010, USAID developed an energy-efficiency support project designed to mobilize private sector investment at the industrial and municipal levels by aiding the development of credit-worthy investment proposals. The program will support the European Bank for Reconstruction and Development direct-lending facilities for commercial end-use efficiency investments. USAID will help mobilize additional indigenous private-sector capital by providing credit-enhancements. The project is designed to be extended or expanded to other Central Asian countries (e.g., Kyrgyzstan), should conditions warrant.

MALDIVES AND SOUTH PACIFIC ISLANDS

Promote Climate Change Mitigation

In FY 2010, USAID supported low carbon energy plans that mapped out a path toward a lower carbon energy economy. USAID created a replicable pilot project with energy systems that are more resistant to the natural disasters that occur in island states. For example, the project supported rooftop solar systems with detachable solar panels that can be removed and protected during hurricanes.

MONGOLIA

Promote Climate Change Mitigation

Mongolia is a country that has traditionally been heavily dependent on coal to generate electricity and heat. The Government of Mongolia identified "ger" district schools–structurally similar to nomadic Mongolian yurts–as a priority focus area to improve health and educational standards of low income youth. In FY 2010, USAID leveraged resources from other donors to retrofit these schools. The program supported retrofits to improve energy efficiency in the heating system and building envelope, reducing energy consumption by more than 50 percent.

PAKISTAN

Improve Market Conditions

To help meet Pakistan's 5,000 MW energy deficit, the USAID/Pakistan Energy Efficiency and Capacity Program focuses on improving the institutional framework to increase private sector investment in energy generation. In addition to creating profitable, unsubsidized private sector energy service companies, the project is developing and implementing energy conservation plans for 15 industrial sectors from March 2009 through March 2012.

Promote Climate Change Mitigation

In 2008, USAID completed wind and solar energy resource assessment maps.

Beginning in FY 2010 and continuing on through 2011, USAID is supporting a wind-power generation project and two 17 MW hydropower projects. The Gomal dam will store enough irrigation water for 190,000 acres in South Waziristan, Tank, and Dera Ismail Khan to control flooding, preventing an estimated $2.6 million annually in damages, and enhancing agricultural opportunities for approximately 30,000 farming families. The Satpara dam irrigation project located in Sakardu, Gilgit-Baltistan, will improve irrigation for 15,500 acres of land and provide 3.1 million gallons of clean drinking water daily for Skardu's 280,000 local residents.

Improve Policy Frameworks
USAID has worked closely with the Government of Pakistan in strategic policy development and targeted feasibility studies to assist with the development of conventional and alternative energy resources. In 2008, in response to a request from the Government of Pakistan, USAID, through SARI/E, helped to prepare a National Policy Framework for Liquefied Natural Gas (LNG) to address clean energy regulatory management, revenue and tariff related issues.

PHILIPPINES

Promote Climate Change Mitigation
In FY 2010, the USG continued to support the Philippine's energy sector priorities in clean energy development through improved sector governance and implementation of key sector reforms, and rural electrification through the use of renewable energy technologies. The Climate Change and Clean Energy (CE) project is focused on creating a robust and competitive environment for domestic and foreign investment through the design and implementation of policy reform. CE works closely with the Philippine Department of Energy and the Energy Regulatory Commission, as well as with other government agencies that play fundamental roles in the effective implementation of different clean energy laws. CE seeks to increase the amount of renewable and clean energy sources in the country's primary energy mix. Increasing the level of public awareness and understanding of issues involving energy reforms and Climate Change concerns is central to the successful implementation of all other tasks under CE.

The Philippines AMORE project is highlighted on page 19.

VIETNAM

Promote Climate Change Mitigation
A USG interagency delegation visited Vietnam in November 2010 and met with representatives from six key government ministries to introduce the Enhancing Capacity for Low Emission Development Strategies (EC-LEDS) initiative.

Philippines

USAID Helps Bring Electricity to Mindanao

Energy is fundamental to economic growth and a catalyst for alleviating poverty in the Philippines, particularly in remote rural communities in Mindanao where about 60 percent of the population lives below the poverty threshold. The nation faces a major challenge of bringing electricity to more than 1,300 barangays (villages) in Mindanao. Roughly half of these communities are ideal candidates for renewable energy electrification because it is not economical for them to connect to existing electricity grids.

The Alliance for Mindanao Off-Grid Renewable Energy (AMORE) is a rural electrification project that utilizes renewable energy, such as solar and micro-hydropower, to provide electricity to communities in off-grid, remote and conflict-affected areas in Mindanao. During the third phase of the project, initiated in FY 2009, electricity services were provided to 653 households, benefiting 3,918 individuals in the autonomous region of Muslim Mindanao. The program provides former rebel communities with energy services for potable water distribution, mechanization of agricultural processing, income enhancing projects, and installation of solar systems in communal facilities such as schools. At the end of the first year of the project, 20 schools have been electrified, providing 5,889 students with access to improved education services, and 1,399 households have been given improved access to safe water through community water supply projects.

AMORE uses a commercial approach to provide technical assistance through training in recipient communities on how to maintain the technical integrity of the energy systems installed; enhance their capability to raise resources for future replacement of parts; and improve the general welfare and development of the community. Under the program, USAID supports strong community participation in designing and operating renewable energy systems. Activities build strong local technical and financial capacity to effectively collect user fee, and to maintain and expand renewable energy systems access in remote rural barangays.

Networking is facilitated between microfinance institutions, renewable energy service providers, and entrepreneurs to help develop the market for solar and other renewable energy systems in Mindanao.
The project relies on public-private partnerships to leverage support and resources in implementation. AMORE plans to continue to leverage additional funds from private partners.

EUROPE AND EURASIA

Countries in the Europe and Eurasia (E&E) region are highly dependent on imported energy, particularly gas from Russia and Central Asia. Energy use is very inefficient and there is extensive use of coal and lignite in domestic electricity generation. The region does have significant renewable resource potential and USAID has moved to address the obstacles to clean energy development during the FY 2008–2010 period.

E&E countries obligated about $59.63 million for clean energy activities between FY 2008 and FY 2010. Major recipients included Albania, Armenia, Bosnia and Herzegovina, Georgia, Kosovo, Macedonia, Russia, Serbia, and Ukraine. E&E also has a regional strategy and program that integrates energy security and climate change to promote regional energy market development and reduce greenhouse gas emissions in cooperation with the European Commission and other donors.

USAID REGIONAL MISSION PROGRAMS

The E&E Bureau has developed a Regional Energy Security program that supports regional cooperation and energy market development. It concentrates on support to the EU Energy Community established under the Athens Energy Community Treaty that went into force in mid-2006 and involves collaboration with the European Commission and other donors. This Treaty provides a harmonized regulatory framework for regional energy reform and is coordinated by a regional secretariat based in Vienna. The Treaty, which initially included mainly Southeast European countries (and Turkey as an observer), has now expanded to include Moldova and Ukraine as well as Georgia as an observer.

In working with the Energy Community, USAID has focused on a number of specific initiatives:

(1) Creation of a regional electricity market and a regulatory framework for increased transparency and inter-country trade. Assistance to the Energy Community Energy Regulatory Board in developing a web-based market monitoring system. USAID is also serving as a catalyst for cooperation among the Electricity Transmission System Operators in both the Balkans and Black Sea region in planning the integration of electricity networks and the expansion of electricity trade. The efforts are currently focused on the many issues related to increased integration of wind and renewable energy into national and regional transmission networks. A complementary regulatory cooperation program has been launched among Black Sea energy regulatory organizations.

(2) Preparation of National Energy Efficiency Action Plans and enabling legislation in the context of the work of the Energy Community Energy Efficiency Task Force and the adoption by the contracting parties of EU Energy Efficiency Directives. USAID has developed a special strategic partnership with Greece, a founding supporter of the Energy Community, to advance energy efficiency and renewable energy.

(3) Improving energy policy analysis through a common, comprehensive energy planning process. This strategic planning activity is referenced in relevant country sections.

(4) Developing a sound regulatory framework for gas diversification and development of a Gas Ring in Southeast Europe.

(5) Increasing awareness of the potential for renewable energy and the steps necessary to improve the investment climate and the processes for renewable energy project development. A stocktaking report was completed in 2009 and a current regional assessment of renewable energy investment processes is underway.

USAID EUROPE AND EURASIA COUNTRY PROGRAMS

ALBANIA

Mitigate Climate Change

To expand its focus on clean energy in Albania in 2009, USAID assisted in the preparation of a National Energy Efficiency Action Plan, as required under the Energy Community Treaty in accord with the EU Energy Efficiency Directive. A strategic planning activity is ongoing to examine the potential and investment requirements for greater energy efficiency and renewable energy activities through 2030.

Improve Regulatory Framework

USAID has worked with other donors and the government to develop a sound legal and regulatory framework, create a viable electricity market, and privatize electricity distribution. USAID assistance has helped to strengthen the capacity of the Albanian energy regulator and to develop a better basis for tariff calculation and formulation.

The privatization of Albania's electricity distribution company was successfully completed in May 2009 and efforts are underway by the new owner (the Czech company CEZ) to improve operation. USAID is continuing vital post-privatization assistance to the Ministry of Economy, Trade and Energy, the energy regulatory agency and to the transmission system operator.

ARMENIA

Improve Market Conditions

USAID has provided extensive energy sector support to Armenia to help reduce its vulnerability to external pressures and diversify its energy supplies. Support for energy efficiency and clean energy has been an important part of this program. The Energy Efficiency Commercialization Project ended in 2010 after developing more than 30 successful projects with the private sector and financial institutions.

USAID's technical assistance program focused on issues related to wind and solar energy potential and needed improvements in Armenia's legal/regulatory frameworks to attract investors. Opportunities for greater electricity trade with Georgia have also been pursued. A strategic planning activity was initiated with the Ministry of Energy and the Armenian Energy Institute to examine the potential and investment requirements for greater use of clean energy and GHG emissions reduction.

Mitigate Climate Change

Hydropower plays a vital role in the Armenian energy system and the country's energy plans call for increases in hydropower capacity from small and medium plants. There are growing issues, however, concerning the sustainability of hydropower resources, in the face of climate change, changing precipitation and river flow patterns, and growing demands for water for agriculture and urban use. USAID has helped in the evaluation of hydropower potential and is developing a new activity that will address multiple use issues of energy and water management.

BOSNIA AND HERZEGOVINA

Improve Regulatory Framework

USAID the European Commission, and other donors are seeking to stimulate action in regulatory reform and restructuring of the ethnically-based utility system. Bosnia has good renewable energy potential and is also beginning to address energy efficiency issues. USAID is promoting cooperation among the three regulatory commissions and supporting energy efficiency efforts. A National Energy Efficiency Action Plan focusing on the buildings sector is being developed with entity authorities under State auspices. USAID is implementing a Development Credit Authority program with a major international bank that will provide loans for energy efficiency and cooperate with credit lines from the European Bank for Reconstruction and Development (EBRD) and Germany's KfW. A "green schools" pilot program is an important example of potential energy efficiency actions. USAID also launched a new Energy Efficiency Project that will be working at the municipal level to support energy efficiency awareness and improvements, primarily in buildings.

GEORGIA

Since the Russian invasion in 2009, and as part of the $1 billion overall U.S. assistance package, USAID has developed several important new projects to further strengthen Georgia's energy system and promote clean energy development. An energy management project is supporting energy efficiency demonstration projects in buildings and hospitals.

Improve Market Conditions

Georgia has made significant progress over the past several years in improving the reliability and security of its energy system. A significant milestone was the privatization of the United Energy Distribution Company electricity distribution company. USAID played a major role in this effort with support through a management contract. The Energy Capacity Initiative has helped build energy management skills and provide opportunities for professional development in energy engineering and other critical energy disciplines.

Reduce Greenhouse Gas Emissions

USAID has been working with the Government of Georgia and nongovernmental groups on a strategic planning project that looks at potential reductions in Greenhouse Gas Emissions and investments in renewable energy and energy efficiency until 2030. USAID is working on the final design of a microfinance initiative in renewable energy systems for off-grid communities in Georgia.

Improve Transmission and Operating Systems

The President of Georgia highlighted Georgia's hydropower development and interest in "Green Energy Development" at the Cancun Climate Change Conference in December 2010. A hydropower investment promotion project is helping the Ministry of Energy in its efforts to attract investors into medium-sized hydropower projects that can diversify Georgia's hydropower production (the majority of which currently comes from the Enguri plant on the border with Abkhazia). The Georgian Government is constructing a new high-voltage line to Turkey that will allow electricity exports from these hydropower plants. USAID is also supporting the rehabilitation of an internal high-voltage transmission link with the Senaki substation. This will improve system reliability, facilitate greater West-East transit, and provide hydropower exports to the South.

KOSOVO

Kosovo's energy system is highly inefficient, polluting, and an obstacle to sustainable economic growth. More than 30 percent of the electricity supply is lost or stolen. Improved collections, investment in end-use efficiency and modern distribution infrastructure, and increased tariffs are needed to provide reliable energy services.

Improve Energy Efficiency

USAID is working to improve the efficiency of electricity use, increase collections and revenues, and reduce commercial and technical losses. USAID efforts have already reduced system losses and improved metering, billing and collections are stimulating greater end-use efficiency. These activities are having a direct impact on CO2 emissions since most of the power is supplied from inefficient, lignite-fired plants and unreliable power supply has led to a proliferation of polluting diesel generators.

Establish Framework for Clean Energy Investment

USAID programs are working with both the distribution utility and its customers to improve service and efficiency and the government and energy regulator to establish the essential preconditions for investment in clean energy development. Improvements in the market and regulatory framework are needed to promote alternative energy supplies, attract private investment in modernizing the distribution company, and increase financing for energy efficiency improvements by industrial, commercial and residential customers.

MACEDONIA

Improve Regulatory Framework

Macedonia's energy sector is in the midst of significant reforms and USAID is playing a significant role in assisting this effort. A National Energy Strategy places increased emphasis on clean energy. USAID is providing substantial support for policy, planning and regulatory development to help advance these efforts. In compliance with the EU Energy Community requirements, Macedonia, with USAID support, has developed a National Energy Efficiency Action Plan and is developing a specific energy efficiency implementation plan. USAID local advisors are working directly with the Ministry of Energy on a new EU-compliant energy law that is very important to resolving market issues involving

private investors. This law was recently approved by the Parliament. In response to the Government's interest in renewable energy, especially wind and hydropower, USAID is helping develop a renewable energy implementation plan. USAID is also enhancing energy policy and planning within the Ministry through work with the Macedonian Academy of Sciences on a long-term investment analysis.

Promote Climate Change Mitigation
As a complement to energy planning and reform efforts, USAID is carrying out three major energy efficiency projects:

First, USAID is nearing completion of a pilot residential energy efficiency project in several apartment blocks that are implementing energy efficiency retrofits in low-income buildings in conjunction with local NGOs and companies. This program will be expanded to 24–30 additional low-income apartment blocks in the planned rollout of this pilot.

Second, the USAID mission has been renovating schools with energy efficiency materials such as double-paned windows, improved insulation and central heating systems.

Third, USAID is supporting a Development Credit Authority program with two Macedonian banks that will provide guarantees for loans for energy efficiency projects. The first loan guarantee was for a municipal project involving schools.

MOLDOVA

Improve Policy Framework
Moldova is dependent on imported energy (gas, electricity, and oil) for more than 90 percent of its energy. Energy efficiency is thus critical to conserve foreign exchange and reduce vulnerability. USAID has been working with the Moldovan Government to introduce new energy efficiency legislation and develop mechanisms for project implementation and financing with other donors. The Energy Efficiency Law was passed in 2010 and USAID is now preparing secondary legislation for implementation. USAID is also working with local and municipal authorities, which have created a municipal energy efficiency network. USAID funded a prefeasibility study for a model energy efficiency school project that is expected to be financed under the World Bank Energy II loan. USAID is integrating its energy efficiency work with a broader local government support activity and incorporating planning and municipal energy efficiency improvement projects into the overall approach.

RUSSIA

Improve Transmission and Operating Systems
Within the framework of the Energy Working Group of the U.S.-Russia Bilateral Presidential Commission, USAID is beginning a "smart grid" partnership program with the Russia Energy Agency, which will link U.S. and Russian utilities interested in pursuing smart grid technology applications. A Russian delegation visited Texas and Washington in December 2010 and a work plan has been developed and approved.

SERBIA

Promote Climate Change Mitigation
USAID is working with Serbian authorities in the development of a National Energy Efficiency Action Plan for the Athens Energy Community, and on a long-range strategic analysis of requirements for expanded energy efficiency and renewable energy production in the period to 2030.

Feasibility studies for the development and substitution of biomass in district heating are nearly complete for promising projects in 10 Serbian cities.

Establishing the Regulatory Framework for Clean Energy Development
USAID has helped to improve the regulatory framework in Serbia for clean energy development through a regulatory partnership between the Pennsylvania Public Utility Commission and the Energy Agency of the Republic of Serbia (AERS) under the auspices of the USAID cooperative agreement with the U.S. National Association of Regulatory Utility Commissioners. This partnership has introduced improved methods for tariff formulation; evaluated schemes for retail competition, reduction in losses, and provision of services to consumers for energy efficiency; and promoted consideration of options for stimulating renewable energy investments.

UKRAINE

Promote Climate Change Mitigation
USAID has re-engaged in the energy sector over this period, focusing on energy efficiency in industry and now in the municipal heating sector. These sectors each account for about 30 percent of Ukraine's gas

use and are highly inefficient. With Ukraine's ratification of the EU Energy Community Treaty, USAID will assist it in meeting its obligation to prepare a National Energy Efficiency Action Plan, focusing on the building sector.

USAID/Ukraine's Municipal Heating Reform (MHR) project is taking a systemic approach to regulatory and institutional reform in this area as well as project specific interventions with 36 cities to develop plans and projects to repair and modernize their gas-fired heating systems, and improve the efficiency of energy use in municipal and residential buildings. Public education and outreach campaigns on energy efficiency and the requirements for improving municipal heating systems are important elements of the MHR program.

Supporting Ukraine's energy efficiency efforts is a high priority of the international community and USAID is planning to provide funding to a new regional European Bank for Reconstruction and Development Fund for Energy Efficiency that will initially focus on municipal heating and related energy efficiency projects in Ukraine.

Increase Institutional Abilities

USAID is working with the Government of Ukraine and the Ukraine National Academy of Science in a strategic energy planning effort to examine requirements for expanded energy efficiency and renewable energy development. Ukraine has communicated to the UN Climate Change process its intent to reduce greenhouse gas emissions and this work will help lay the basis for an emissions reduction strategy.

Ukraine

Schools Cut Costs

Photo by Simone Kozhukharov

Using energy effectively and efficiently is one of the most pressing challenges facing Ukraine today. During the summer tourist season, energy use and costs peak in Crimea, an autonomous region inside Ukraine. "Crimea is one of the sunniest regions of Ukraine and enjoys about 280 sunny days a year. So it's the most appropriate place to utilize solar energy," said Aleksandr Slepokurov, head of the Creative Union of Scientific and Engineering Societies of Crimea, an NGO based in Crimea's capital city Simferopol. "By installing solar panels, Crimeans can better satisfy their demand for energy use and significantly save costs."

Kindergarten No. 9 in Bakhchysaray, Crimea, is among the first to benefit from USAID's assistance. Prior to the installment of the solar panels, water was warmed in a large cooking pot. Now, this work is done through a solar water heating system that heats water in a water tank, making hot water available for use at any time. By using solar panels, the kindergarten demonstrated to the community how it can cut costs as well as be more environmentally friendly. Kindergarten Director Lyudmila Basenko said, "Solar energy helps us not only to save electricity, but also makes us less dependent on limited budget funding. At least we have warm water for our children."

To support solar energy, the Creative Union set up an information center in Simferopol to advise on energy-saving issues and installation of solar power equipment. USAID funding also enabled the Creative Union to partner with four producers of solar equipment, local governments, and expert NGOs to expand its promotion of solar energy.

LATIN AMERICA AND THE CARIBBEAN

USAID obligated approximately $13.9 million during Fiscal Years 2008–2010 for clean energy activities in three countries in Latin America and the Caribbean through bilateral and regional programs. Countries assisted through bilateral programs were Brazil, Colombia, Dominican Republic, Honduras and Mexico.

USAID REGIONAL PROGRAMS

In Central America, USAID works to identify synergies across countries and propose efforts appropriate at regional scale that benefit all the countries of the subregion. USAID supports the integrated energy grid, regulatory reform that supports increased use of renewable energy, and seeks to overcome the small scale and high costs of energy in each country.

Promote Climate Change Mitigation

USAID, through its Cooperative Agreement with the Central American Commission for Environment and Development, is successfully promoting policies to encourage public-private partnerships for environmental protection and to develop economic incentives for environmental management. Each Central America-Dominican Republic Free Trade country is in the process of implementing an Energy Efficiency Regional Strategy and a Regional Clean Production Policy and Strategy. Regional mechanisms have been developed to promote energy efficiency, train employees, and recognize companies that adopt cleaner production practices.

USAID support toward the reduction of greenhouse gas emissions from the energy sector, industry and urban areas includes a Development Credit Authority loan guarantee to provide credit to small and medium size entities to invest in cleaner production technology; industrial and municipal waste reduction and recycling efforts; and pilot municipal waste methane gas recovery.

In FY 2010, USAID supported the design and implementation of a new, multi-year regional program for clean energy deployment. Potential focus areas include building capacity for greenhouse gas emissions measurement, monitoring and verification; enhancing local capacity to participate in carbon markets; strengthening state and municipal clean energy policies; and supporting the adoption of clean energy, energy conservation, and energy efficiency. The new program may focus on specific renewable energy projects–wind, solar, biomass, and hydropower–or on increasing local and regional renewable power generation and transmission capacities. USAID is conducting an assessment to identify focus countries in Central America for specific clean energy interventions.

Improve Regulatory Capacity

As part of an overall Clean Energy Series, the National Association of Regulatory Utility Commissioners **(**NARUC) organized a regional workshop, held in August of 2010, co-hosted by the Regulatory Authority of Public Services in Costa Rica (ARESEP) and the Association of Central American Electric Energy Regulatory Authorities (ACERCA). This workshop was designed to introduce regulators from the LAC region to basic regulatory tools to promote renewable energy, carbon reduction and clean energy policy frameworks that may affect the role of the regulator. More than 26 regulators from eight different regional countries participated and each country shared their experiences in renewable energy and the regulatory framework that impacts investment and integration of renewables in their respective countries. This activity successfully introduced the USAID/NARUC Renewable Energy

Handbook that describes regulatory incentives for promoting renewable energy to a wide audience of regulators from the Latin America and Caribbean regions. As a result of this workshop, NARUC gathered information to plan tailored regional and country-specific clean energy activities that participants identified would help enhance their ability to regulate renewable energy.

USAID COUNTRY PROGRAMS

BRAZIL

Promote Clean and Efficient Energy Technologies

USAID/Brazil supports a Clean Energy Program designed to develop local renewable energy and energy efficiency capacity, advance clean energy technologies and services, mitigate climate change effects, and build a low carbon-based economy.

In FY 2010, the Clean Energy Program focused on fostering the design and implementation of models and innovative methodologies to promote increased energy efficiency, clean renewable energy, and decentralized energy technologies through the implementation of three activities: The Clean Energy Consortium Agreement with the Brazilian NGO IDER; the Integrated Resources Plan for Fernando de Noronha Island; and the Private Financing Advisory Network (PFAN). For an overall description of the PFAN Initiative, see page 32.

The USAID Clean Energy Consortium supported the installation of:

- A Clean Energy Learning Center in Santo Antonio da Patrulha, Rio Grande do Sul. The center has three components: an energy efficient house, a Sun Station, and a Biomass and Hydroelectric Station.
- Twenty-three thousand energy efficient cook stoves, benefiting nearly 90,000 people from 63 municipalities.
- A solar hybrid water treatment and supply system in São Francisco do Aiucá-AM to capture river water and rainwater. Community members trained by the Consortium are replicating the system in the community of Nova Colômbia, Amazonas.

Partnerships were developed with organizations, including the United Nations, Nike, and Petrobras to develop clean energy projects.

The Integrated Resources Plan for Fernando de Noronha Island cooperated with the National Renewable Energy Laboratory (NREL), a U.S. Department of Energy (DOE)-supported lab, and with the German Development Authority (GTZ) to develop a renewable energy and energy efficiency strategy for the island of Fernando de Noronha. The strategy will serve as the basis for the development effort led by the local utility CELPE. The island is a protected natural reserve, but as a result of increased tourism, energy demands on the inefficient diesel-fired electrical generators have increased and resulted in increasing emissions and environmental degradation. NREL presented its final report in October 2010 and proposed a system that will decrease costs (paying for itself after only two years), decrease emissions, and use renewables to generate 80 percent of the island's energy needs.

USAID/Brazil also continues to support the H2SOL project, a successful solar-powered hydroponic pepper business on small farms in the drought-stricken northeastern region of Brazil. The project, initiated in FY 2008, is managed by 36 families and the peppers are sold to markets, restaurants, and resorts in the northeast. In FY 2009, to promote clean energy for high-value agricultural products, the project was replicated to transfer clean technology to Mozambique.

Photo by: Ana Paula Paiva, USAID/Brazil

A telecenter in Maguary, Brazil avoids carbon emissions by using solar power.

COLOMBIA

In FY 2010, USAID worked with the U.S. Department of State, Department of Energy and the Foreign Commercial Service in the design of a new climate change and clean energy initiative program for implementation in FY 2011.

DOMINICAN REPUBLIC

Increase Energy Access

USAID's five-year program, Implementation of the National Rural Electrification Plan, managed by the National Rural Electric Cooperative Association (NRECA), ended September 30, 2008. USAID's technical assistance helped increase access to reliable electricity for low-income Dominicans living in rural areas and established a sustainable electricity program for these groups. At the end of FY 2008, 44,070 people had increased access to modern energy services through USAID's program. Additionally, a total of 15 electricity-related public-private partnerships were forged.

Promote Renewable Energy

In FY 2008, USAID supported small-scale renewable energy projects in rural areas. Electric distribution materials were procured for 15 micro-hydropower distribution mini-grids; and a Memorandum of Understanding was signed with the Juntayaque Agricultural Producers Group, and the Small Grants Program of the United Nations, to implement a micro-hydropower electric generation system in the central mountain region of the Dominican Republic.

Promote Energy Efficiency

USAID also implemented the Residential Energy Efficiency program in 2008. The program supported training-of-trainers' courses on home energy audits, meter reading, and compact fluorescent light bulbs in seven Dominican rural towns. Training was provided to one-hundred and twenty-seven people on residential energy efficiency. Households were also given residential high efficiency appliances with USAID assistance.

HONDURAS

Promote Renewable Energy

USAID/Honduras is supporting the Government of Honduras in strategic renewable energy planning. USAID has funded two community-level micro-hydropower renewable energy projects in western Honduras: a hydroelectric turbine which "piggy-backed" onto a rural water system, and a solar energy project.

MEXICO

Improve Policy, Legal, and Regulatory Frameworks

In FY 2010, USAID supported policy and regulatory assistance to support clean energy generation through the deployment of renewable and energy efficient technologies. USAID is also working with the state of Baja California, the Ministry of Energy, and the federal electricity regulatory body to support the development of a renewable energy industry and address regulatory barriers to the creation of a regional U.S.-Mexico renewable energy market.

Promote Renewable Energy

USAID is also supporting the U.S. National Lieutenant Governors Association and Mexican state counterparts to facilitate projects for self-supply in Mexico and form private sector partnerships to promote renewable energy inputs. USAID is promoting cross-border dialogue on renewable energy opportunities and marketing of wind and solar energy with the Border Legislative Conference and the Border Governors Conference; and supporting research to inform state policymakers in the U.S. and Mexico through the Border Research Alliance and member institutions.

USAID is supporting renewable energy generation by providing technical assistance on financing options to the national government, states, and municipalities that are seeking to use renewable energy domestically or for export to the U.S.

MIDDLE EAST

In 2010, the U.S. Energy Information Administration forecast energy consumption in the Middle East to climb by 45 percent between 2007 levels and 2020 with an annualized growth rate of 2.2 percent, demand growth that is second only to Asia. The past year has seen a major push toward renewable sources of energy, as the region's states work to solve the problems of burgeoning domestic growth through energy diversification.

USAID's clean energy obligations for Fiscal Years 2008–2010 in the Middle East region consisted of $13.25 million which was entirely spent in Jordan.

JORDAN

Jordan has traditionally been dependent on imported fuel to meet its energy needs: fuel imports accounted for nearly 20 percent of Jordan's GDP, according to the National Electric Power Company (NEPCO) of Jordan. The 2007 National Energy Law proposed a new energy mix for the country by 2020: 29 percent of Jordan's energy needs to be met by natural gas, 14 percent from oil shale, 10 percent from renewable energy sources, and 6 percent from nuclear energy.

Increase Institutional Capacity

USAID is partnering with the U.S. Energy Association (USEA) and the U.S. NARUC to help Jordanian energy regulators and utility companies enhance the energy efficiency of their utilities and better manage energy demand to reduce greenhouse gas emissions. These efforts emphasize building capacity and working collaboratively with local practitioners. In 2010, USAID and the USEA worked on better utility planning and developing low carbon energy sector strategies. Delegates from Arizona Public Service traveled to Amman, Jordan to meet with their counterparts at NEPCO. This exchange aims to improve the reliability and stability of the transmission grid system, accelerate the integration of renewable energy into the grid, and improve transmission system planning and operations. The partnership introduced advanced operating techniques for the Jordanian electricity market and cross-border electricity exchange.

Promote Renewable Energy Resources

Jordan's National Energy Strategy mandates that 10 percent of the country's energy use must be met though renewable energy resources by the year 2020. The country has since adopted comprehensive renewable policies and laws. USAID is assisting Jordan to attract foreign investment in wind and solar projects, and to accelerate the integration of renewable energy into Jordan's transmission grid.

Promote Energy Efficiency

Jordan initiated the 'Building Green in Jordan' project in 2009 to help promote the "green" or energy efficient building concept. To reflect market reality, a new building being constructed was selected as a case study to undergo the process of achieving a Leadership in Energy and Environmental Design (LEED) certification from the U.S. Green Building Council (USGBC). The goal was to assess the appropriateness of using the LEED rating system for the Jordanian building industry. In January 2011, the USGBC issued an approval for the first Jordanian Gold Level LEED pre-certified building.

CENTRALLY FUNDED PROGRAMS

A small portion of USAID's clean energy obligations are managed centrally from USAID's Washington headquarters. These programs provide thought leadership, address regional energy issues, knowledge sharing, identification and dissemination of best practices and lessons learned, test and institutionalize innovative approaches, and provide procurement mechanisms promoting clean energy and energy efficient technologies.

"Promoting clean energy is not only a global environmental issue. It is a health issue. It is an economic issue. It is a security issue."

Secretary of State Hillary Clinton

USAID's centrally funded programs obligated approximately $21.1 million for clean energy projects in Fiscal Years 2008–2010. Centrally funded programs are those funded by USAID offices based in Washington, D.C., including the Office of Infrastructure and Engineering's Energy Team and the Global Climate Change Team.

ENERGY TEAM, OFFICE OF INFRASTRUCTURE AND ENGINEERING

Improving Health Facility Infrastructure

The goal of the Improving Health Facility Infrastructure (IHFI) program is to improve critical infrastructure services at health facilities and ensure that measures are taken to enhance the sustainability of foreign assistance investments. The program is focused in five of the 15 USG President's Emergency Plan for HIV/AIDS Relief (PEPFAR) focus countries.

PEPFAR is a multi-country, multi-billion dollar initiative to prevent and treat HIV/AIDS in developing countries. Many PEPFAR focus country treatment programs are directly compromised by the lack of reliable power at health facilities. Health facilities need reliable power supply to keep vaccines cool and effective; power lights and equipment; facilitate communication and record-keeping; and help improve preventive and critical care. Health professionals and managers are increasingly burdened with how to keep the power supply at their clinics and hospitals.

USAID has provided support to USG PEPFAR programs in Haiti, Rwanda, Ethiopia, Zambia, and Guyana to improve energy services at critical health facilities. As of FY 2010, more than $3 million has been obligated for initial assessments in each country, training courses for local energy experts and PEPFAR partners, facility retrofits, and the development of several knowledge management tools on health facility energy issues. In 2010, USAID developed "Powering Health," an online knowledge portal for all those seeking options to provide reliable electricity to power health clinics and facilities in developing countries.

Fuel Efficient Cookstoves

Humanitarian organizations are becoming increasingly concerned about energy issues in communities, camps, or settlements where internally displaced persons (IDPs) or refugees are settled temporarily. At a minimum, all displaced people require fuel to cook, and the manner in which fuel is obtained and used can have significant impacts on displaced populations, host communities, and the surrounding natural environment. There is much debate over what types and styles of stoves are the most fuel-efficient and user-friendly, and whether a particular stove will be useful to displaced populations.

In FY 2008 and FY 2009, USAID evaluated the efficiency and efficacy of cookstoves distributed by Agency grantees in camps for IDP's in Northern Uganda, Darfur, and Kenya. The evaluations revealed that fuel-efficient stoves (FES) have many positive potential impacts in a camp, settlement, or other IDP setting, but many implementing partners lack the knowledge and resources to effectively implement programs. Fuel-efficient stoves may help save energy, reduce the time and burden of collecting firewood, and limit the associated exposure for collectors to physical attack and/or gender-based violence. The production and sale of FES can provide important income-generating opportunities for local manufacturers and sellers. Because traditional open fires can be very unsafe in crowded camp or settlement conditions, FES reduces the risks of uncontrolled fires, as well as burns suffered by cooks and children. In many cases, cutting trees, shrubs, and roots for fuel can lead to the depletion of forests and environmental degradation in areas that host transient populations. Fuel-saving stoves may

slow the degradation and help ease tensions over the use of, and access to, these natural resources.

Based on these findings, in FY 2010, USAID developed a toolkit to help humanitarian organizations design and implement effective programs for wood-burning stoves. The toolkit contains surveys, stove testing protocols, and standard good practices.

Electricity Governance Initiative
In 2008, USAID supported the Electricity Governance Initiative (EGI) managed by the World Resources Institute. EGI is a collaborative research-action initiative to benchmark best practices in governance and promote accountability in the electricity sector. EGI is a partnership of civil society and electricity sector stakeholders in India, Indonesia, Thailand, and the Philippines. The partnership complements the efforts of civil society, governments, and private sector actors to advance public interests in the electricity sector and improve electricity sector governance.

Energy Utility Partnership Program
The Energy Utility Partnership Program increases access in developing countries to environmentally sound energy services by (a) improving policy and legal frameworks to establish necessary market conditions for private sector delivery of energy and environmental management services; (b) increasing institutional ability to provide or deliver services in the new and enhanced markets; and (c) increasing public understanding of, and participation in, decisions regarding delivery of energy and environmental management services.

U.S. electric utility experts have established six global utility partnerships under this program. The partnerships have created a platform to share lessons learned in the fields of renewable energy deployment, energy efficiency programs, demand side management, and advanced metering technologies. Between FY 2008 and FY 2010, more than 200 people were trained in energy related policy and regulatory practices.

Global Regulatory Network
The Global Regulatory Network (GRN) promotes a better understanding of complex regulatory issues, including those involving clean energy, faced by public utility regulators in Africa, the Caribbean, Latin America and Asia. For countries with recently created associations, the GRN facilitates information exchange and provides local capacity building for utility regulatory commissions.

"Humanity demands better ways to bring energy to areas where sunlight and wind are ample, but on-grid electricity is foreign."

USAID Administrator Rajiv Shah

Sustainable Energy Use Alliance
The Sustainable Energy Use Alliance is a partnership between USAID and the International Copper Association (ICA) to provide support to several energy projects around the globe. In Brazil, USAID and ICA worked with AES Eletropaulo, an electricity distribution company working in metropolitan Sao Paulo, to reduce illegal electricity connection in nearby slums, both for safety and revenue reasons. USAID coordinated the alliance and provided technical assistance while ICA provided the rewiring of homes and energy-efficient retrofits.

USAID GLOBAL CLIMATE CHANGE TEAM

Enhancing Capacity for Low Emission Development Strategies (EC-LEDS)

The U.S. Government is pursuing an integrated whole-of-government approach, led by USAID, to provide technical and analytic support to developing countries for the development and implementation of ambitious and analytically rigorous low emission development strategies (LEDS). Designed and led by partner countries, these country-driven strategies will catalyze cooperative public and private action to support the transition to low carbon economic development.

In 2010, technical teams visited Vietnam and Bangladesh to begin work on the EC-LEDS program in each country. The interagency teams, led by USAID, included representatives from the Department of State, Environmental Protection Agency, Department of Energy, U.S. Forest Service, U.S. Department of Agriculture, and the National Renewable Energy Laboratory. The interagency teams met with host country government counterparts to discuss areas of possible cooperation to enhance in-country capacity to complete a strategy for low emission economic growth as called for in the Cancun Agreements and Copenhagen Accord. This new presidential initiative has a long-term goal of reducing greenhouse gas emissions while achieving a multitude of national development objectives, including energy security, industrial competitiveness, private sector investment, economic growth, and poverty alleviation.

Private Financing Advisory Network

The Climate Technology Initiative (CTI) Private Financing Advisory Network (PFAN) is a multilateral, public-private partnership initiated by CTI in cooperation with the UN Framework Convention on Climate Change's Expert Group on Technology Transfer. USAID supports the PFAN whose partners include: the Asia Pacific Partnership, the Renewable Energy and Energy Efficiency Partnership, and several private sector companies. PFAN works to reduce greenhouse gas emission by "bridging the gap" between cash-strapped clean energy projects and investors. PFAN targets small-scale projects that, unlike large energy investments, are typically unable to secure financing.

CTI PFAN screens clean energy business plans, selects the most economically viable and environmentally beneficial projects, provides multiple rounds of coaching and guidance on the development and preparation of bankable business plans and then connects the projects with investors and financiers from its global and regional investor networks.

At the end of 2008, CTI PFAN embarked on a major scale-up program, rapidly expanding its development pipeline and establishing regional and in-country networks and project development operations. In 2009, PFAN expanded further supporting Clean Energy Investor Forums in Indonesia, the Philippines, and Singapore for the Asia region. At these forums, which attracted more than 100 potential investors each, entrepreneurs presented renewable energy business projects in biomass, biogas, wind energy, waste-to-energy, landfill methane capture, and small hydropower.

In 2010, CTI PFAN extended its global scale-up program with the establishment of dedicated networks and operations in Africa (including Mozambique, South Africa and Uganda), Brazil and India. These networks continue to complement the existing extensive regional networks in South East Asia and Latin America. In total, 53 projects (selected from over 264 applications) were showcased at seven Financing Forums held throughout 2010 in the Philippines, Indonesia, China, India, Africa, South East Asia Regional, and Brazil. More than 1,100 participants–investors, financiers, project developers and other stakeholders–attended these forums. Thirteen of the showcased projects have already raised $168 million of investment and financing. Another 42 applicant projects were identified for longer-term development.

In total, CTI PFAN has successfully brought 22 projects, with a total investment volume of $264 million, to financial closure, equating to an annual GHG reduction potential of 1.6 million tons and an energy savings potential of 61 GW hours annually. The current CTI PFAN project development pipeline contains more than 100 projects with a total investment value of $2.4 billion and an annual GHG reduction potential of 4.6 million tons.

CLEAN ENERGY SUB SECTORS

Clean energy can be broken out and divided into sub sectors classified as: renewable energy, energy efficiency, energy sector reform and enabling environment, transmission and operating systems, gas flaring mitigation, biomass and biofuels. The following section will describe projects under each of the clean energy sub sectors.

AFGHANISTAN

On April 6, 2009, electricity flowed for the first time in Dodarak village in Nangarhar Province; supplied by a new 60 KWH micro-hydropower plant funded by USAID. Currently, the plant provides 1,200 residents with electricity, allows local shops to sell cold food and drinks, and has the capacity to serve 600 additional households in neighboring villages.

The power plant, built in compliance with international standards, will provide electricity for up to 40 years. Electricity is available to the village's residents and businesses for a small, affordable fee, which will be used to pay power plant technicians and perform needed maintenance.

Capitalizing on the new supply of electricity, USAID worked with Dodarak residents to develop businesses in their village, which include: a strawberry jam factory, a flour mill, a textile factory, and a carpentry facility–none of which could have operated without the electricity that the micro-hydropower plant provides. These businesses will provide needed employment and advance economic development in Dodarak and surrounding areas.

Excited at the new development prospects for his community, village head Malik Mir Alam Khan said, "This project is a blessing to the people of this village … in addition to the prospects that it will light up more houses, small industries will be established, employing a large number of people … the economy of the community has improved and I am sure more significant, positive changes will occur."

SOUTH ASIA

USAID partnered with the Sri Lanka Sustainable Energy Authority and the Lighting Research Center (LRC) to establish the RCEEL in April 2009. Headquartered in Colombo, Sri Lanka, the RCEEL is designed to support collaborative initiatives with Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka to advance sustainable lighting, making it affordable in South Asia to improve the well-being of the citizens and the countries within the region.

The LRC is helping provide training programs for government agencies, utilities, contractors, lighting designers, and other lighting professionals. The LRC was selected by USAID in 2009 to guide the establishment of the RCEEL in South Asia. Through this partnership, the LRC has helped to develop education, training, research and testing programs, as well as strategic industry collaboration initiatives to foster regional manufacturing and job growth through the transformation of lighting to greater sustainability.

The Sri Lankan government contributed a new 10,000-square-foot facility, located in Colombo, Sri Lanka, to the RCEEL for the purpose of supporting this sustainable lighting initiative. This laboratory is designed to aid regional manufacturers in developing high-quality LED products and assist government agencies in implementing quality control programs to safeguard consumers from inferior products.

Other activities since April 2009 have included education seminars to increase the knowledge of the newest advances in energy-efficient lighting design, technology, and measurement as well as LED systems integration issues involving electrical, optical, and thermal characteristics of LEDs, as well as measurement and evaluation techniques for LEDs and LED systems.

JORDAN

Policy reform is a critical precondition for clean energy development. Reforms needed include: establishing a regulator that can efficiently operate with clean energy, a system operator that can function with intermittency, manageable subsidies that won't encourage excessive energy use, and distribution companies that control losses and recoup costs while promoting customer interest in efficiency.

Since May 2009, NARUC and the Jordan Electricity Regulatory Commission (ERC) have collaborated in partnership to support opportunities for peer-to-peer practitioner information exchange and training for the Jordan ERC. The themes of energy efficiency and renewable energy are the backbone of partnership discussions.

USAID SOUTH ASIA REGIONAL INITIATIVE

South Asia is rich in many forms of energy and bordered by complementary oil and gaseous energy resources in the Middle East and Central Asia. The South Asian countries are blessed with significant clean energy resource endowments: the hydropower potential in Bhutan and Nepal are estimated at 30,000 and 40,000 MW, respectively. All countries in this region have excellent solar and wind power potential. India and Bangladesh have good coal and gas reserves. To achieve long-term energy security, the South Asian countries must harness their full generation potential, and diversify their energy mix.

Domestic energy demand in smaller economies such as Bhutan and Nepal is far less than the available clean energy supply. In the absence of export markets, no economic incentive exists for these countries to develop their domestic energy resources. Bangladesh, India and Pakistan are witnessing energy scarcity and could benefit from the surplus energy potential. Cross-border energy trade could be an important tool to ensure regional energy security.

To realize cross-border cooperation, each country must continue to advance reforms, including rationalizing pricing policies and adopting transparent regulations through independent regulatory bodies.

FY 2010 funds encouraged the creation of market mechanisms necessary for trade in energy. Work with policy makers has enhanced regional energy cooperation through linkages in national policies and international agreements. Outcomes will include increased growth, improved regional security and stability.

With FY 2010 resources, USAID, through SARI/E, is providing technical assistance for cross-border power projects between India-Sri Lanka, India-Bangladesh, and Central Asia-South Asia. The program will also fund executive exchange events to build the capacity of South Asian executives in the areas of transmission, renewable generation, energy efficiency, and clean technologies. The program will also target institution building by supporting the establishment of four regional climate innovation centers to advance clean energy development.

NIGERIA

There is more gas flared in a single concentrated geographic area in Nigeria than anywhere else in the world. The Niger Delta is the single largest point source of carbon dioxide in the African continent and its gas flares are visible from space.

A number of gas flares have burned constantly for more than 40 years and continue to expose Niger Delta communities to severe health risks, and damage and degrade their property.

The illegal process of burning unwanted "associated gas" brought up as oil is extracted from the ground has been in place since 1984. Although the Government of Nigeria (GON) has set multiple deadlines to halt the practice, the practice still continues. USAID is taking a lead role in attempting to mitigate the severe health risks, damaged property, and other negative impacts of widespread gas flaring in Nigeria. USAID's strategy is to consider gas flaring mitigation as a unique opportunity to reduce global GHG emissions. At the same time, infrastructure required for long-term economic growth is enhanced.

The shortage of electricity has led to the development of IPPs interested in using natural gas to increase electricity supply. In FY 2009, USAID

assistance strengthened the IPP Association and conducted analysis on the impact of the problem and different solutions. In addition, assistance has helped the GON analyze the regulation of IPPs.

Moving toward the goal of reduced gas flaring and increased generation of clean energy, greater private sector participation has been encouraged through the regulatory enabling environment. USAID/Nigeria is supporting the GONs President's Task Force on Power Reform as well as the Nigerian Electricity Regulation Commission to improve management of the sector.

Once fully implemented, Nigeria's climate change programs are expected to result in notable reductions in gas flaring, potentially displacing up to 30 million tons of CO2e annually; in addition to creating thousands of new jobs, the programs will attract outside financial capital to the sector.

PHILIPPINES

Scaling up clean energy will be essential for promoting low-carbon development over the coming decades, particularly in Asia where energy demand is growing rapidly. One major hurdle to the large-scale deployment of clean energy has been the significant gap between traditional investors and clean energy project developers, who are often not brought together in effective ways, particularly on small-scale projects. In June 2009, Asea One Power Corporation won first place in the business plan competition at the Philippines Clean Investor forum after working with the USAID-supported PFAN for several months to refine its business plan to build distributed biomass plants. In the first phase of a four-phase business plan, Asea One, the project developer, intends to build four biomass plants that will bring 30 MW of generating capacity to a region of the Philippines that has long been a net importer of power. In addition to significantly reducing annual GHG emissions, the biomass plants will provide needed income to local farmers. Agricultural waste composed mainly of rice husks and rice straw will generate power for the first biomass plants. The agricultural waste will be purchased from local farmers and millers through long-term partnership arrangements. These contracts will not only guarantee the long-term supply of feedstock while managing risks from price spikes, but will also benefit local farmers through a profit-sharing scheme.

The President of the Philippines, Gloria Macapagal Arroyo, presided over the groundbreaking of the first biomass power plant in December 2009. Asea One was able to launch the project after closing on the first $30 million of an expected $75 million in financing for phase one, thanks to the mentoring and facilitation of PFAN. As of early 2010, the project was the largest biomass power plant initiative in the Philippines.

Annex: TITLE IX–INTERNATIONAL ENERGY PROGRAMS

SEC. 901. DEFINITIONS.

In this title:

(1) APPROPRIATE CONGRESSIONAL COMMITTEES. The term "appropriate congressional committees" means:

(A) the Committee on Foreign Affairs and the Committee on Energy and Commerce of the House of Representatives; and

(B) the Committee on Foreign Relations, the Committee on Energy and Natural Resources, the Committee on Environment and Public Works, and the Committee on Commerce, Science, and Transportation of the Senate.

(2) CLEAN AND EFFICIENT ENERGY TECHNOLOGY.—The term "clean and efficient energy technology" means an energy supply or end-use technology that, compared to a similar technology already in widespread commercial use in a recipient country, will—

(A) reduce emissions of greenhouse gases; or

(B) (i) increase efficiency of energy production; or
(ii) decrease intensity of energy usage.

(3) GREENHOUSE GAS.—The term "greenhouse gas" means—

(A) carbon dioxide;
(B) methane;
(C) nitrous oxide;
(D) hydrofluorocarbons;
(E) perfluorocarbons; or
(F) sulfur hexafluoride.

Subtitle A—Assistance to Promote Clean and Efficient Energy Technologies in Foreign Countries

SEC. 911. UNITED STATES ASSISTANCE FOR DEVELOPING COUNTRIES.

(a) ASSISTANCE AUTHORIZED.—The Administrator of the United States Agency for International Development shall support policies and programs in developing countries that promote clean and efficient energy technologies—

(1) to produce the necessary market conditions for the private sector delivery of energy and environmental management services;

(2) to create an environment that is conducive to accepting clean and efficient energy technologies that support the overall purpose of reducing greenhouse gas emissions, including—

- improving policy, legal, and regulatory frameworks;
- increasing institutional abilities to provide energy and environmental management services; and
- increasing public awareness and participation in the decision-making of delivering energy and environmental management services; and

(3) to promote the use of American-made clean and efficient energy technologies, products, and energy and environmental management services.

(b) REPORT.—The Administrator of the United States Agency for International Development shall submit to the appropriate congressional committees an annual report on the implementation of this section for each of the fiscal years 2008 through 2012.

(c) AUTHORIZATION OF APPROPRIATIONS.—To carry out this section, there are authorized to be appropriated to the Administrator of the United States Agency for International Development $200,000,000 for each of the fiscal years 2008 through 2012.

ACRONYMS AND ABBREVIATIONS

ACEP: Afghan Clean Energy Project

ADB: Asian Development Bank

AERS: Agency of the Republic of Serbia

AFR: Africa Regional (USAID)

AIP: African Infrastructure Program (USAID)

AMORE: Alliance for Mindanao Off-Grid Renewable Energy

BERC: Bangladesh Energy Regulatory Commission

CDCP: Clean Development and Climate Program (USAID)

CE: Clean energy

CHP: Combined-heat-and-power

CO2: Carbon dioxide

CO2e: Carbon dioxide equivalent

CTI: Climate Technology Initiative

CTI PFAN: Climate Technology Initiative Private Financing Advisory Network

DABS: Da Afghanistan Breshna Sherkat

DOE: Department of Energy

DSM: Demand Side Management

E&E: Europe and Eurasia (USAID region)

EAPP: East Africa Power Pool

EBRD: European Bank for Reconstruction and Development

ECB: Electricity Control Board

EC-LEDS: Enhancing Capacity for Low Emission Development Strategies

ECO-Asia: Environmental Cooperation-Asia (USAID)

ECOWAS: Economic Community of West African States

EGAT: Economic Growth, Agriculture and Trade (USAID bureau)

EGI: Electricity Governance Initiative

EHS: Environment, Health, and Safety

EPA: Environmental Protection Agency

ERC: Electricity Regulatory Commission

EU: European Union

FES: Fuel efficient stoves

FY: Fiscal year

GDA: Global Development Alliance

GDP: Gross domestic product

GHG: Greenhouse gas

GON: Government of Nigeria

GRN: Global Regulatory Network

GW: Gigawatt

ICA: International Copper Association

IDPs: Internally displaced persons

IHFI: Improving Health Facility Infrastructure

IPPs: Independent Power Producers

KETRACO: Kenya Electricity Transmission Company

KWH: Kilowatt hours

LAC: Latin America and the Caribbean (USAID region)

LEC: Lesotho Electricity Company

LEC: Liberia Electricity Company

LED: Low Emission Development

LEDS: Low Emission Development Strategies

LEED: Leadership in Energy and Environmental Design

LNG: Liquefied Natural Gas

LRC: Lighting Research Center

LTWP: Lake Turkana Wind Power

MHR: Municipal Heating Reform

MRV: Monitoring, reporting and verification

MW: Megawatt

NARUC: National Association of Regulatory Utility Commissioners

NECC: Nigerian Energy and Climate Change

NEPCO: National Electric Power Company

NEPS: North East Power System

NGO: Nongovernmental Organization

NRECA: National Rural Electric Cooperative Association

NREL: National Renewable Energy Laboratory

ODP: Office of Development Partners (USAID)

PEPFAR: President's Emergency Plan for HIV/AIDS Relief

PFAN: Private Financing Advisory Network

PV: Photovoltaic

RCEEL: Regional Center for Energy Efficient Lighting

RDMA: Regional Development Mission for Asia (USAID)

SADC: Southern African Development Community

SARI/E: South Asia Regional Integration Program for Energy (USAID)

SMMEs: Small, medium, and microenterprises

UN: United Nations

USAID: United States Agency for International Development

USEA: U.S. Energy Association

USG: U.S. Government

USGBC: U.S. Green Building Council

WHA: Bureau for Western Hemisphere Affairs (U.S. Department of State)

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