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BRIEFING ON AFRICAN ENERGY REFORM

AFRICA INFRASTRUCTURE PROGRAM PROJECTS



The Africa Infrastructure Program (AIP) provides capacity building and late-stage transactional services on clean and conventional energy projects to regional economic communities, host country governments, and private project developers in Sub-Saharan Africa.

The three-year program, which started in September 2008, is expected to add at least 1 gigawatt of new generation capacity and leverage more than \$1 billion in new investment in a region where less than 28 percent of the population has access to commercial energy. A significant contributor to USAID's global climate change efforts, AIP operates in cooperation with USAID African regional and bilateral missions.

*AIP has completed activities in Nigeria and Kenya and is currently providing services to several renewable and conventional energy projects in **Ghana, Nigeria, Mozambique, Namibia, Kenya, South Africa, Cameroon, and Rwanda**. It supports clean electric sector capacity building throughout Africa.*

*Discussions are under way on future potential AIP projects in **Lesotho, Zambia, Senegal, Uganda, Ethiopia, and Tanzania**.*

For more information on AIP, which is supported by Nexant, Inc., contact AIP Director Jeffrey Humber at 1-202-712-1153, jhumber@usaid.gov

Current Projects

Kenya: Capacity Building and Transaction Support for the Lake Turkana Wind Project

Kenya's power sector is heavily dependent on hydropower, which is vulnerable to declining rainfall. Thus, the immediate need is to broaden sources of generation, specifically renewables, and extend the grid to the 85 percent of the population without electricity.

AIP is providing critical capacity building to newly formed, government-owned Kenya Electricity Transmission Company Limited (KETRACO), together with transaction advisory assistance in its negotiations over the commercial arrangements for the new transmission line KETRACO is building to move power from the 300-MW Lake Turkana Wind Power Project (LTWP) in northwestern Kenya to the population centers. The estimated cost for the LTWP is \$860 million, with an additional \$235 million estimated cost for the 430-kilometer transmission line. Once completed, the transmission line will stimulate other renewable energy development on its path along the Great Rift Valley, which is rich in geothermal energy. LTWP will include the installation of 353 wind turbines of 850 KW each, exploiting the very high wind speeds found in the Turkana low jet stream corridor.

AIP assistance will facilitate the LTWP in generating up to 25 percent of Kenya's electricity needs from renewable energy and potentially displace 650,000 tons per year of CO₂ generation. Benefits include creating hundreds of jobs and feeding clean power into Kenya's national grid to provide electricity to those currently without it.

Beneficiaries

KETRACO

Potential Assistance

Capacity building and transaction support

Expected Benefits

Strengthened contract development and negotiating capabilities, creation of hundreds of jobs, and a substantial contribution to global climate change efforts through the provision of clean power to the national grid

South Africa: Advisory Services for Independent Power Producers

South Africa faces a shortage of generation capacity, massive investment requirements, and the need for structural reform. The power sector must attract private sector capital and diversify away from its reliance on the government-owned, monolithic utility ESKOM.

AIP advisors are supporting a capacity building and transaction advisory initiative to strengthen the ability of the Department of Energy and associated government agencies in South Africa to address structural issues in the country's energy sector and, by virtue of South Africa's role as a key regional off-taker, in the broader Southern Africa region. The assistance will also help the National Electricity Regulator of South Africa (NERSA) to implement policies to be adopted by the National Treasury to support development of the sector by shifting a significant portion of future additional generation capacity from the public sector to independent power producers (IPPs). IPPs will be attracted to the sector as a result of the creation of an impartial independent system and market operator and competitive energy procurement policies.

The AIP support will assist the Department of Energy in considering structural and policy measures to attract IPPs and diversify into new renewable energy resources. Capacity building that supports structural changes in the power sector of South Africa will usher in IPPs and encourage the development of renewable resources in the country, potentially creating hundreds of thousands of jobs.

Beneficiaries

Department of Energy, NERSA, National Treasury, IPPs

Assistance Provided

Capacity building and enabling policy advisory services

Benefits

Strengthened environment for renewable energy resources, promotion of energy sector enabling policies for IPPs, as well as the potential creation of hundreds of thousands of jobs

Namibia: Capacity Building for the Electricity Control Board

Namibia's current electricity capacity meets only 63 percent of demand, but scarcity of capital is preventing the investment needed to improve the situation. AIP is providing capacity building and transaction support services to the Electricity Control Board of Namibia to establish the framework and enabling environment to attract the needed capital. In the process, it is providing vital background information on international best practices in the relatively new field of renewable energy integration. As the sector opens up to private investment and IPPs, particularly in renewable energy, developers require this assistance to complete key project agreements.

With AIP's assistance, Namibia can move beyond its current power monopoly structure and develop IPPs under commercial project finance arrangements for future clean energy projects. Proposed developments benefiting from this program will result in 100 megawatts of new renewable energy capacity and hundreds of new jobs, as well as displacing 200,000 tons per year of CO₂ generation.

Beneficiaries

Electricity Control Board of Namibia, Nampower

Assistance Provided

Capacity building and transaction support

Expected Benefits

Strengthened capacity to regulate, develop, and finance renewable energy projects; creation of hundreds of jobs; and global climate change relief through displacement of a significant amount of CO₂

Nigeria: Gas-Flaring Reduction and Renewable Energy

Nigerian offshore platforms flare considerable amounts of associated gas, a byproduct of offshore crude oil extraction. This flaring generates significant greenhouse gas emissions. Onshore, there is a tremendous need for clean power generation—a need that can be met by capturing and redirecting this associated gas.

AIP focuses on gas-flaring reduction through the Nigeria Energy and Climate Change initiative that will channel reprocessed gas to power plants onshore. AIP identifies barriers along the gas-to-power chain and supports the Independent Power Producers Association of Nigeria in addressing them. AIP also aims to demonstrate the potential of clean energy IPPs to the government, establish models for bankable power purchase agreements and other IPP agreements, advise on a framework and methodology for cost-reflective tariffs, and assist with specialized finance techniques for prospective IPPs.

Once fully implemented, these programs can lead to notable reductions in gas flaring, which can displace the generation of up to 30 million tons of CO₂ per year. The programs will also create thousands of new jobs and attract outside capital to the sector.

Beneficiaries

Independent Power Producers Association of Nigeria, Ministry of Power, PHCN, First Solar

Assistance Provided

Capacity building and technical consulting services

Expected Benefits

Development of the Nigerian IPP market, diverting flared gas to power generation through the new IPPs to significantly reduce CO₂ generation, and creation of thousands of jobs

Ghana: Advisory Services for the Development of the Gas Sector

As a result of significant offshore oil discoveries, Ghana is transforming from a hydrocarbon importer to a hydrocarbon producer. The resulting economic and environmental impacts present significant challenges and opportunities for its energy sector and economy.

AIP is providing capacity building and advisory services to the Ministry of Energy aiming to help them define and conduct institutional, regulatory, and commercial strategies in the development of the country's nascent gas sector and make decisions that reflect international best practices. The program provides training to Ghanaian officials and other local stakeholders in the development of the natural gas industry in Ghana.

AIP's assistance will help Ghana develop and implement a sustainable gas sector master plan to monetize the country's associated gas resources by preventing wasteful and environmental harmful gas flaring and by substituting the clean-burning natural gas for more polluting liquid fuels. Benefits include sustainable development and optimal utilization of Ghana's new hydrocarbon resources with an emphasis on reducing greenhouse gases by promoting the use of natural gas as a transition fuel to a longer-term clean energy economy.

Beneficiaries

Ministry of Energy

Assistance Provided

Technical consulting services and capacity building and training

Expected Benefits

Accelerated creation of a hydrocarbon regulatory system and optimization of the country's resources within a global climate change framework that emphasizes reducing greenhouse gases

Nigeria: Geometric Power Project Support

The Nigerian electricity sector is chronically short of generation capacity and needs capital to upgrade and expand. The current generation mix is inadequate and dependent on inefficient and high-emitting diesel generators and biomass sources.

AIP is facilitating development of the Geometric Power Aba, Ltd (GPAL) project, which will generate and distribute power to industrial, commercial, and residential customers. GPAL proposes to construct a thermal power plant with a capacity of 188 MW, an extensive new network of 33 KV lines, and a dedicated gas pipeline to a local Shell Petroleum gas station. Investors and lenders in GPAL include the International Finance Corporation, European Investment Bank, Emerging Africa Infrastructure Fund, and a syndicate of prominent Nigerian banks led by Diamond Bank and Stanbic IBTC Bank Plc.

The project will expand the power sector, reduce greenhouse gas emissions by 500,000 tons per year of CO₂, and create hundreds of jobs while alleviating chronic power shortages.

Beneficiaries

GPAL

Assistance Provided

Transaction, financial, and regulatory advisors

Expected Benefits

Alleviation of chronic power shortages through a new power plant that uses previously flared gas and will result in a significant reduction in CO₂ emissions and creation of hundreds of jobs

Mozambique: Wind Energy Capacity Building for Ministry of Energy

Mozambique's power system is dominated by hydropower generation supplying the Southern Africa Power Pool. Although this generates earnings, much of the population remains without access to electricity.

AIP is providing capacity building to the Ministry of Energy to help it establish a regulatory framework and integrate the country's first wind energy generation project into the existing hydro-dominated power system. AIP 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 develop and negotiate key commercial contracts such as power purchase agreements.

The immediate benefit of this program is facilitating the government's structuring of current projects on the coastal Inhambane and Ponta d'Ouro wind sites, consisting of IPPs of 30 MW each, which will lead to a potential reduction of 140,000 tons per year of CO₂ emissions, create hundreds of new jobs, and give greater access to electricity for the population.

Beneficiaries

Mozambique Ministry of Energy, Electricidade de Moçambique

Assistance Provided

Capacity building and transaction support

Expected Benefits

Strengthened capacity to regulate, negotiate, and develop wind power projects, leading to substantial reductions in CO₂ emissions, creation of hundreds of new jobs, and increased access to electricity for the population

Ghana: TEMA IPPs - Support to Grid Company of Ghana

Ghana needs to expand the power sector and has the requisite large capital requirements to do so. Development of the Jubilee oil field will make large amounts of associated gas available for power generation as a substitute for higher-polluting fuels.

AIP advisors are providing capacity building and transactional advisory services to the state-owned Grid Company of Ghana (GRIDCo) in its negotiations with two Ghanaian gas-to-power combined-cycle IPPs, aiming to help them achieve financial closure in discussions with private developers. The focus is on building local capacity with respect to the wheeling and grid connection, extending later to gas sales agreements.

AIP program support is expected to result in the installation of 552 MW of new power while leveraging approximately \$700 million in new investments, generating construction and economic development employment, and creating demand for the associated gas that would otherwise be flared—preventing 1.7 million tons of CO₂ generation per year.

Beneficiaries

GRIDCo

Assistance Provided

Capacity building and transaction support

Expected Benefits

Installation of 552 MW of new power, leveraging \$700 million in new investment, reduction in gas flaring, and elimination of 1.7 million tons of CO₂ emissions

Botswana: Mmamabula Power Project

AIP is providing legal, financial, engineering/procurement/construction, tariff, and environmental advisors to the Government of Botswana to assist in its negotiations with CIC Energy on the 1,300-MW Mmamabula power project, which will burn coal and sell a portion of the power to the Botswana Power Company and the balance to ESKOM, South Africa's national utility. The Mmamabula project is expected to be the largest IPP in Sub-Saharan Africa, using the most recent coal-burning technologies and creating more than 10,000 jobs for the country.

Beneficiaries

Government of Botswana

Assistance Provided

Technical and advisory services

Expected Benefits

Installation of 1,300 MW of new generation capacity, and the leveraging of \$3.5 billion in new investment, leading to the creation of more than 10,000 jobs

Rwanda: Tariff-Setting and Micro-Hydro Implementation for Rwanda Electricity Corporation

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. The 11 million Rwandans have access to only 72 MW of generating capacity for all their electricity needs.

AIP is reviewing all forms of renewable generation to expand the current system and reach the unserved population. Rwanda has hundreds of potential micro-hydro sites that could double the country's generating capacity and expand electrification rates to 35 percent of the population in 10 years. AIP is conducting a comprehensive assessment of the necessary tariff structure for renewable energy sources from micro-hydro, solar, geothermal, and wind and is assisting in applying the structure to the power purchase agreements with the first group of micro-hydro projects. This Renewable Energy Feed in Tariff (REFIT) framework, once in place, will encourage private sector investment in the sector to expand generation capacity.

With AIP's assistance, Rwanda can expand the small and medium enterprise sector, promote development of clean energy, increase electricity penetration, and avoid the generation of up to 500,000 tons of CO₂ while creating tens of thousands of jobs through an expansion of the economy.

Beneficiaries

Rwanda Electricity Corporation

Assistance Provided

Technical assistance, capacity-building and transaction support

Expected Benefits

Establish a REFIT program to expand the generating capacity of the country, substantially increasing electrification of the population, spurring investment, and creating tens of thousands of jobs

Cameroon: Revenue Cap Tariff Implementation for ARSEL

Cameroon privatized the majority of its national electricity company to a strategic investor in 2000. Operations have improved, but increasing the electrification rate for the country has stalled because of tariff system limitations and the need to strengthen the regulator.

AIP is assisting in implementing a tiered program of reform: introduce a revenue cap tariff system, improve regulatory controls and systems in preparation for IPPs, design contracts for power connection and transmission services, and renegotiate the Framework Concession License Agreement (FCLA). Assistance is provided through formal training, capacity building, informal mentoring, and development of contract templates. Once these reforms are implemented, the Agence de Régulation du Secteur d'Electricité (ARSEL) will be in compliance with FCLA, a new regulatory framework to promote IPPs will be in place, and further competition will be introduced in the sector.

Cameroon can potentially leverage \$18 billion of new investment in the power sector over the next decade and develop 7,000 MW of power generation largely through clean energy sources, substantially strengthening the domestic system and resources of the Central African Power Pool.

Beneficiaries

ARSEL

Assistance Provided

Training, capacity building, and advisory services

Expected Benefits

Strengthening of the regulatory capacity and systems, implementation of a revenue cap tariff system to expand private sector generation, and potential development of 7,000 MW of power generation mostly through clean sources

Virtual Working Group: Financing African Power Projects

AIP has several communication and training programs, a key one is the co-sponsoring the Virtual Working Group—an innovative series of video conferences to bring together the major players in African power development.

The Virtual Working Group is a collaboration of the Infrastructure Consortium of Africa, African Development Bank, and the U.S. Department of Treasury. USAID is also a co-sponsor. Based on the success of the initial sessions concluded in the spring of 2010, a more ambitious program of four global video conferences is being conducted in 2010 and 2011 with additional country and industry players.

The conferences provide a platform for participants to access technical assistance, examine successful case studies, learn about the key principles common to all African power projects, and benefit from an innovative approach to capacity building.

Beneficiaries

Virtual Working Group participants: Kenya, Ghana, Nigeria, Mozambique, Senegal, and Tanzania

Assistance Provided

Global Video Conference with review of common elements in power development

Expected Benefits

Sharing of ideas and workable solutions to closing project financing for African power development

Recently Completed Projects

Kenya: Renewable Energy Workshop

AIP conducted a two-day workshop in Nairobi for senior representatives of the Kenya Power and Lighting Company (KPLC), Kenya Generating Company (KenGen), and officials from the Ministry of Energy. The workshop focused on identifying what differentiates renewable energy projects from other commercial electricity-generating technologies in terms of using nonrecourse project financing. Working in conjunction with General Electric, the workshop brought together solar, hydro, and wind technology specialists, experts in project finance and public-private partnerships, and senior officials from Namibia and Mozambique who are involved in wind energy project negotiations in their respective countries.

Beneficiaries

KPLC, KenGen, Ministries of Energy Kenya/Mozambique, Namibia ECB

Assistance Provided

Technical workshop

Benefits

Increased hands-on knowledge of renewable technologies and related financing

Nigeria: Advisory Support Services to Nigerian Gas and Power Sectors

Working with the USAID Mission in Nigeria, AIP supported the World Bank by analyzing critical issues and risks associated with the provision of World Bank Partial Risk Guarantees (PRGs) for Nigeria's gas and power sectors. AIP analysis covered industry structure, Nigeria's new gas policy, gas supply and transport agreements, as well as the electricity sector and the new multiyear electricity tariff order. At the United States–Nigeria roundtable for energy and climate change in May 2009, the World Bank noted that it had approved \$600 million in support of the power and gas sectors, of which \$400 million will be used for the gas sector PRGs and \$200 million extended in the form of soft-credit IDA loans.

Beneficiaries

World Bank and Nigerian Gas and Power Sector

Assistance Provided

Energy sector analyses

Benefits

Potential reduction in gas flaring and leveraging of \$600 million in potential new investment risk guarantees in the Nigerian electricity and gas sectors