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Lessons from a
Sector-Wide Approach (SWAp)

RWANDA SWAp ACHIEVEMENTS

Households Connected

2008: 110,000

2012: 357,000

Rwandans Connected

2008: 6%

2013: 16%

New Connections

2008: 23,000

2012: 100,000

Cost per Connection

2009: US\$ 1,000

Sept 2012: US\$ 840

2013: US\$ 600 (target)

Kilometers of New Network Connected

2012: 1,000 km

ESMAP Helps Triple Electrification Rates in Rwanda

With a chronically low national electrification rate and a dilapidated energy infrastructure, the government of Rwanda faced a steep uphill battle when in 2008 it committed to triple household electricity access over a mere five-year period.

At the time, only 6 percent of Rwandans—roughly 110,000 households mostly concentrated in and around the capital, Kigali—were connected to the grid.

Barely three years later the number of grid-connected households had more than tripled to 357,000—an increase which exceeded the government's ambitious original five-year target.

ESMAP laid the groundwork for this rapid extension of grid electricity by helping develop a national rollout plan using a Sector Wide Approach (SWAp) for the energy sector. The

impacts of the energy SWAp were immediate and widespread. By September 2012, 16 percent of Rwandans had access to the grid and the Rwanda Energy Corporation (RECO) was connecting 100,000 new households a year, a four-fold increase over the 2008 connection rate.

Edward Kasumba, Coordinator of Electricity Access Rollout with Rwanda's Energy Water and Sanitation Authority, said the benefits of the SWAp were far reaching.

"Schools that never before had computers were connected to the internet—which is a very great achievement in remote areas—and hospitals and health centers that had been unable to afford fuel for their generators were able to operate equipment that had been sitting unused."

The SWAp concept emerged in the 1990s as

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Edward Kasumba
Coordinator of Electricity
Access Rollout with
Rwanda's Energy Water
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Dana Rysankova
Senior Energy Specialist,
World Bank Africa Region

an alternative to traditional aid. The approach rallies donors and stakeholders around a set of clearly defined goals and is marked by strong country ownership, low transaction costs, and a flexibility that provides partners with the option to invest in specific sub-sectors.

The Rwanda energy SWAp was launched in July 2008 with the establishment of an Energy Sector Working Group (SWG) and the signing of a Memorandum of Understanding between the Rwandan government and its senior development partners, including the World Bank, the African Development Bank, the European Union, the Netherlands, and Belgium.

Over the following six months ESMAP—through the World Bank's Africa Renewable Energy and Access Program (AFREA)—provided funding and technical assistance to the SWG to operationalize the SWAp framework. This assistance included help in producing an investment prospectus which outlined the SWAp's targets and detailed how they could be met through coordinated donor financing.

Erik Fernstrom, a Senior Energy Specialist with the World Bank's Africa Region Energy Unit, said a key first step in determining the parameters of the SWAp involved making a fundamental determination.

“We needed to decide which parts of the country would receive immediate electrification and which would have to wait, because even if the SWAp achieved its initial targets, millions of Rwandans would remain off the grid for years to come.”

To identify the physical locations and least-cost electrification options to be contained in the investment prospectus, the SWG deployed a range of sophisticated GIS-based spatial planning techniques that had previously been used in successful ESMAP-supported projects in Kenya and Senegal.

In what was the first time GIS was used in Rwanda, engineers fanned out across the country with hand-held devices mapping population density and areas of economic activity. They also marked the location of every school, health clinic, and administrative center, as connecting these important hubs to some form of electricity was a primary government objective.

Dana Rysankova, a Senior Energy Specialist with the World Bank's Africa Region, said the GIS data was to form the backbone of the investment prospectus.

“GIS helped us map out exactly where the demand would be greatest and determine the most economical way to reach as many Rwandans as possible.”

IMAGES

All images courtesy of the
Energy Access Rollout Project.



Mr. Fernstrom said that ensuring the financial sustainability of an expanded electricity network was another important consideration. As such, the SWG assessed the ability of the population to afford basic connectivity charges by measuring household income and expenditure data. It was found that despite Rwanda's low-income levels, some 370,000 households would be willing and able to pay the cost of grid connection and recurrent charges.

The completed investment prospectus was distributed to donors in early 2009 and formally unveiled at a Donor Financing Roundtable held in Kigali in March of the same year.

The prospectus outlined a practical, well targeted and least-cost SWAp mechanism designed to achieve Rwanda's near-term electrification goals at a cost of US\$ 250 million. The plan identified clear roles, was in sync with the government's economic development and poverty reduction targets, and put in place a technical assistance program to ensure quality control, transparent allocation, and efficient procurement processes.

To maximize coverage and minimize program costs, the investment prospectus focused primarily on communities located close to the current network—over 95 percent of the proposed new connections were within five kilometers of the existing grid—and centered on densely populated areas such as Kigali and urban areas in the northeast of the country.

Wherever possible, SWAp financing would rehabilitate and improve existing infrastructure and ensure that new construction integrated low-cost technologies and took advantage of renewable energy sources.

The plan reflected the government's target of connecting every school, health clinic and administrative center with electricity either through a grid connection or, in remote areas, through solar PV units or transmission lines running to mini-hydro stations.

To reduce the need for costly domestic re-wiring—and to enable households in dwellings not previously eligible for a connection, such as thatched houses or temporary constructions—the program supported initiatives to mainstream the use of low-cost ready boards.

With customer numbers set to triple, the plan provided support for the RECO to extend its service network to new areas. This would include establishment of new customer service centers and procurement of equipment and vehicles for improved maintenance and reduced customer-complaint response times.

In terms of financing, the investment prospectus outlined a '10-10-80' "Shared Financing Plan" by which the cost of SWAp energy sector interventions would be met through affordable customer charges (10 percent), government funding (10 percent), and contributions from development partners (80 percent).

The Donor Financing Roundtable concluded with a pledging session at which eight development partners pledged US\$ 228 million to implement the Rwanda energy sector SWAp.

This included US\$ 70 million in zero-interest financing from the World Bank's International Development Association, the concessional loan and grant-making arm of the World Bank Group. Pledges were also announced by the Government of Rwanda, RECO, and major donors such as the African Development Bank, the Arab Bank for Economic Development in Africa, Belgium, the European Union, the Netherlands, Japan, the OPEC Fund for International Development and the Saudi Fund.

Implementation of the SWAp began in mid-2009, and little more than three years later the sector-wide approach had transformed Rwanda's energy sector.

As of early 2013, more than 1,000 kilometers of transmission



ESMAP MISSION

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

cable had been added to the existing grid. A total of 509 primary and secondary schools had been connected to electricity, along with 125 health facilities and 81 administrative offices.

Additionally, more than 57,000 households—representing 27 percent of all domestic connections—were using energy efficient CFLs that had been provided under the SWAp as part of a “welcome package” to newly connected households.

The cost per connection—which stood at US\$ 1,000 in 2009—had dropped to US\$ 840 by September 2012 and was expected to decrease further by the end of 2013.

Mr. Kasumba said the SWAp had brought a new vitality to many far-flung areas.

“On the economic side, we’ve seen that business centers are able to work into the evening and night and that shops and markets are able to use refrigeration to keep their produce fresh.”

Paul Baringanire, the World Bank’s Task Team Leader for the SWAp, said the project has had a transformational impact on local economies throughout the country.

“The Energy SWAp has created new employment opportunities and helped small- and medium-sized businesses develop—both of which are key to poverty reduction,” Mr. Baringanire said.

“These impacts became clearly visible just a few months after areas were electrified,” he added.

Mr. Fernstrom said the SWAp framework had struck the right balance between ambition and achievability, providing donors with a practical roadmap illustrating how Rwanda’s electrification targets could be attained by realistic financing and implementation measures.

When implemented, Mr. Fernstrom said, the program demonstrated the catalytic power that can be unleashed when development partners are given the opportunity to rally around a collective goal.

“The SWAp became a collective juggernaut that brought us all to a shared outcome,” he said.

