



Light and Hope: Rural Electrification in Peru

IBRD Results

SYNOPSIS

In Peru, the IBRD is helping the government bring electrical power to rural communities through a program to extend the electricity grid or install solar power systems that to date has reached 105,165 people and will reach almost 500,000 people by end 2011.

Challenge

Lack of access to electricity, together with the scarcity of other infrastructure services, constrains economic development and hampers improvements in living standards by limiting the quality of medical care, and the availability of education opportunities. The high poverty levels in rural areas of Peru and the growing gap in quality of life with rapidly developing urban areas highlight the importance of investing in basic rural infrastructure, such as electricity, as part of the national development agenda. Recognizing this, the government has made rural electrification one of its highest priorities. The International Bank for Reconstruction and Development (IBRD) Rural Electrification Project is helping the government increase access of the rural poor to electricity with assistance from the Global Environmental Facility (GEF). When the IBRD and GEF-assisted Rural Electrification Project began in mid 2006, more than six million people in the predominantly poor rural areas of Peru did not have access to electricity. At 30 percent coverage, this was one of the lowest rural electrification rates in Latin America.

Results

[1] Overall, the project will provide new electricity service to 100,250 rural households or almost 460,000 people

through extensions of the electricity grid by end 2011. As of December 2009, 105,165 people had received new electricity service through the extension of the grid and sub-projects were under construction to provide an additional 255,940 people with electricity by the end of 2010. Additionally, sub-projects had been bid out to extend electricity service from the grid to 93,825 people. The electricity service is provided on a sustainable basis through the regulated operation of electricity distribution companies that have a record of good operational performance in rural areas.

- [2] Solar photovoltaic (PV) projects have been prepared to provide electricity to an additional 39,300 people living in isolated rural areas that are too sparsely populated to be served by the national or local grid by the end of 2010. The government estimates that 300,000 isolated rural households cannot be reached by extending the electricity grid and will need to be served by renewable energy. With Project support, distribution companies will soon be providing regulated electricity service in isolated areas for the first time, using individual solar PV systems. Distribution companies will own the systems and will be responsible for providing electricity service to their customers who will pay a tariff.
- [3] The Project is helping rural families use electricity to increase productivity and incomes, which also raises electricity usage levels and makes its provision more economical. Because most rural households have low

levels of electricity, for example to only power lights and a radio or small TV, these households fail to take advantage of income-generating opportunities that could be created based on the availability of modern energy, and make service provision more difficult for the companies. **In rural areas near Cuzco, non-governmental organizations (NGOs) contracted by the Project have helped 1,466 families utilize electrical equipment to process cereals, coffee, cocoa, baked goods, meat products, milk, wood and metal products and handicrafts.** The local distribution company decided to offer a preferential tariff to these small users for off-peak hour consumption of electricity. Even though this may mean less income, the company will benefit from a better balance of energy demand. The Project is extending this activity to new areas and scaling up this experience in other parts of the country.

- [4] The Project has prepared a Google Earth-based wind map** (<http://dger.minem.gob.pe/atlaseolico/PeruViento.html>) **and is preparing a GIS-based inventory of small hydropower sites to be provided to potential investors of clean generation projects.** IBRD wind and hydro experts assisted by bringing state of the art technical expertise to both tasks.

Approach

In late 2007, the local team implementing the Project was fully integrated into the Ministry of Energy and Mines (MEM), as the Directorate of Competitive Funds (DCF) within the Directorate General of Rural Electrification. Full integration of project management into the regular operations of the Ministry has facilitated decision making, sustainability and impact and is an indication that the Ministry has completely accepted the Project's approach to financing rural electrification.

Sustainability and efficiency of the rural electrification service are assured by the fact that the electricity distribution companies prepare, execute and operate the rural electrification subprojects as part of their regular commercial operations. Proposals are presented for financing in competitions held periodically, according to project guidelines. The projects need to meet technical,

economic and financial criteria and are evaluated both by DCF and by the National System of Public Investment (SNIP). Renewable energy options are fully integrated into the project. MEM has requested that the electricity regulator, OSINERGMIN, establish a regulated tariff for electricity service for solar PV systems for the first time and ensure that PV customers are eligible for the cross-subsidy provided under the electricity law to small users by large users.

For the first time in Peru, the project has supported the introduction of renewable energy into the regulated electricity service of distribution companies. Regulated tariffs for the renewable energy electricity provision are relatively new. The only other country in Latin America with regulated tariffs for solar PV service is Argentina.

In addition to the Rural Electrification Project, the IBRD (with support from the Energy Sector Management Assistance Program (ESMAP) has assisted the government with a program of activities to support clean energy development, including: (a) encouragement of the involvement of small and medium enterprises in the electricity sector, especially for renewable energy service provision, where these local agents if trained and contracted can provide dispersed operation and maintenance support; (b) promotion of small hydropower development; (c) removal of barriers to development of hydropower in general, to reverse the trend of growth in thermal power generation; (d) investigation of the impact of climate change on hydro resources (i.e. availability of water in rivers); and (e) estimation of the market potential for natural gas in Peru.

Good Practices Developed or Replicated

The project's approach to electricity service provision through distribution companies using a competitive model is recognized by the government as both efficient and sustainable. The approach, developed jointly, is based on experience provided by the World Bank from other countries in the regions, such as Chile, Ecuador, and El Salvador. As noted above, the approach has been fully integrat-

SUMMARY TIMELINE

April 2004 to July 2006	Rural Electrification Project Preparation
August 2006 to December 2011	Rural Electrification Project Implementation
2006 to March, 2009	Small and Medium Enterprise Energy Services Delivery Study
September 2006 to June 2008	Institutional and Financial Framework for Small Hydropower Development
February 2008 to December 2009	Overcoming Barriers to Hydropower Study
March 2008 to February 2010	Assessment of Climate Change Impact on Peru's Hydrology: a Methodology
June 2008 to March 2010	Downstream Natural Gas Study
June 2009 to October 2009	Second Rural Electrification Project Preparation
November 2010 to October 2014	Second Rural Electrification Project Implementation

ed into the permanent structure of the Ministry of Energy and Mines, and will continue after project closing. Seventy percent of the almost US\$100 million of financing for this component has been committed and all of the funds are expected to be committed by mid 2010.

The introduction of a regulated tariff for solar PV systems is an important innovation that could be replicated in other countries. While Argentina has such tariffs in certain provinces, no other country in Latin America has

introduced an official tariff at national level for solar PV service.

Finally, promotion of productive uses is beginning to show successful results because of the government's commitment, strong NGO partners, a good system of rural credit availability and the willingness of distribution companies to participate. The availability of a small percentage of funds from the government's permanent Rural Electrification Fund provides the opportunity to

IBRD CONTRIBUTION

Activity Name	Total Cost (US\$ millions)	IBRD (US\$ millions)
Lending		
Rural Electrification Project (in implementation)	144.55	50.00
Second Rural Electrification Project (in preparation)	100.00	50.00
Sub-total lending	244.55	100.00
Technical Assistance		
Small and Medium Enterprise Energy Services Delivery Study	0.37	—
Institutional and Financial Framework for Small Hydropower	0.13	—
Overcoming Barriers to Hydropower Study	0.42	0.23
Assessment of Climate Change Impact on Peru's Hydrology: a Methodology	0.21	—
Natural Gas Market Study	0.36	0.26
Sub-total TA	1.49	0.49

expand and prolong this effort in Peru. The approach was based on similar activities carried out by the World Bank in Indonesia and could be replicated in areas with similar conditions.

Next Steps

The Government has requested an additional loan equal to the original amount of US\$50 million to continue the application of the IBRD sponsored model of rural electrification that encourages efficiency and sustainability by working through the existing electricity distribution companies, while at the same time encouraging them to provide regulated service through renewable energy technologies such as individual solar home systems. This will be especially important to achieve the goal of providing electricity



to the estimated 300,000 households living in isolated areas that cannot be reached by grid extension. At the same time, the efforts to promote productive uses of electricity will be sustained and expanded through the new operation and financing from the government's Rural Electrification Fund.

LEARN MORE

Links to key related sites:

- Project Appraisal Document Rural Electrification Project:
http://imagebank.worldbank.org/servlet/WDS_IBank_Servlet?pcont=details&menuPK=64154159&searchMenuPK=64154240&theSitePK=501889&eid=000112742_20060221120152&siteName=IMAGEBANK
- Dirección General de Electrificación Rural, Ministerio de Energía y Minas:
<http://dger.minem.gob.pe/>
- Peru IBRD Country Website:
<http://intranet.worldbank.org/WBSITE/INTRANET/INTCOUNTRIES/INTLAC/INTPERU/0,,menuPK:343091~pagePK:145931~piPK:147174~theSitePK:343085,00.html>
- Peru Windmap on Website of Ministry of Energy and Mines:
<http://dger.minem.gob.pe/atlaseolico/PeruViento.html>
- Maps on Ministry of Energy and Mines website showing location of World Bank supported rural electrification sub-projects (under Dirección choose Direcc. De Fondos Concursables):
http://dger.minem.gob.pe/Proyectos_ElectrificacionRural_Filtros.aspx
- Peru's Plan Nacional de Electrificación Rural:
http://dger.minem.gob.pe/Proyectos_pner2009.aspx