

ECUADOR

CASE STUDY

ENERGY

Ecuador initiated electricity sector reforms in the mid 1990s, with the adoption of new sector legislation and regulations, the creation of regulatory and electricity wholesale market institutions, and the break-up of the national monopolies. The new electricity sector law and derived secondary regulations included policies and mechanisms to make services more accessible and affordable to the poor, as well as to make the power sector more environmentally sound.

While the overall reformed framework was perceived satisfactory, by early 2000s the electricity sector still faced different hurdles and problems as to attain its mid-term and long-term sector developmental goals:

- *Gaps in the regulatory framework:* specific regulations needed to be elaborated and applied, especially on (i) tariff setting and transmission charges, (ii) operation of the wholesale market, (iii) defense of competition, (iv) environmental management, and (v) rural electrification.
- *Weak institutional capacity:* While the new regulatory and electricity wholesale market institutions (respectively, CONELEC and CENACE) operated since end 90s, both entities needed to improve their procedures and technical capacity, inter-agency relationships, and dealings with sector enterprises and consumers, in order to inter alia foster introduction of effective competition, extend services in rural areas, and mitigate environmental impact of activities in the sector.
- *Inadequate tariffs:* Total subsidization for consumption of electricity in 2000 was nearly 1.5% of GDP (around US\$300 million) and electricity prices on average covered only 55-60% of economic costs. Despite having implemented gradual tariff adjustment programs, tariffs still did not reach the economic cost of electricity by December 2002. Thus, the privatization process of electricity companies was not successful at all due to pending necessary tariff increases.
- *Sub-optimal investment in the sector:* Inadequate tariffs over extended periods lead to a serious deterioration of the financial position of the sector enterprises. Financial problems, and the weak planning capacity of the sector institutions, have been the two major reasons why expansion of generating capacity kept not pace with demand, and investment has traditionally been high cost in order to meet emergency needs, rather than part of a least-cost expansion plan.
- *Lack of access to electricity in rural and remote areas:* In 1999, 80.3 percent of the population in Ecuador had access to electricity. This national average hides a huge rural/urban gap: 95.8 per cent of the urban population, but only 54.9 per cent in the rural

zones. By 2000, the National Electrification Plan expected to increase coverage in the rural areas up to 65% over ten years. However, it had an important shortcoming in its approach: it only considered increases in coverage through grid extensions, financed in part by the National Rural Electrification Fund (FERUM).

- The Plan did not include options for developing off grid projects to reach populations away from the grid, and there was no financing mechanism, similar to the FERUM, that could ensure their financial sustainability.
- *Low level of implementation of environmental guidelines:* While the overall legal framework reflected a coherent policy to promote sound environmental management in the electricity sector, actual implementation lagged behind due to the lack of specific environmental regulations and procedures, weak institutional capacity of CONELEC in this field, and absence of instruments to assess the environmental impact of projects and monitor compliance.
- *Inefficient Use of Energy:* Due to a history of energy subsidies, the efficiency of both electricity and fuels use in Ecuador had been very poor, as shown by both the wasteful habits of end users and the high energy consumption of existing lighting, appliances and equipment in homes, buildings and factories.

In the context of Ecuador's overall developmental goals of reducing poverty, reactivating the economy, promoting integration into international markets, and fostering private participation, an ongoing 2nd stage program was started by 2002 for deepening sectorial electricity reforms, that extends the market-oriented reforms initiated in the early 1990s and addresses explicitly the most critical issues still pending in the sector (as discussed above). Specifically, the strategy in the electricity sector has five main objectives:

- Completing the regulatory frameworks and strengthening the regulatory and supervisory agencies to provide a stable environment with clear rules that will attract investment while protecting consumers and investors.
- Promoting competitive markets and private sector-led growth in order to enhance efficiency in the provision of services and attract the resources needed for expansion.
- Improving living standards of the poor and broadening opportunities for MSB by extending access to electricity (as well as telecommunications, internet, and ICT-based business services) in rural and peri-urban areas.
- Implementing environmentally sound policies in the electricity sector that reduce pollution and GHG emissions, ensuring that environmental considerations are incorporated into sector policies and investment decisions, promoting the use RET for rural electrification, and promoting efficient use and conservation of electricity.
- Developing effective communications and consultation mechanisms in order to build social consensus around the reform programs in the sector.

Following these strategic lines for consolidation of the sector reforms, since 2002 the electric sector entities (CONELEC, CENACE), in collaboration with other relevant agencies (inter alia National Modernization Council/CONAM, Ministry of Energy & Mines/MEM, Ministry for the Environment) have been actively involved in the implementation of a comprehensive set of sector assistance programs. Ongoing assistance programs include the wide-scoped "Power Sector, Telecommunications Sector & Rural

Services Modernization Project – PROMEC” (with IBRD loan and additional GEF funds) but also different projects with specific purposes in renewable energies, energy efficiencies, subregional energy systems integration and public electric facilities privatization. External multilateral agencies collaborating in such projects include GEF, IBRD, IADB, CAF, UNDP, as well as some bilateral cooperation agencies from European Union parties.

The scope of these programs encompasses:

Regulatory framework

Regulations have been developed and adopted to (i) create a liberalized wholesale market for electricity, (ii) promote the creation of competitive structures in the sector and prevent anti-competitive behavior, (iii) move tariffs closer to long run marginal costs, and (iv) improve the environmental management of the sector.

Rural electrification

The Government is committed to the extension of electricity services, using private/public partnerships. CONELEC has improved the Indicative Electrification Plan (10 year planning horizon, updated on a bi-annually basis) to design a coherent strategy that considers both expanding coverage through grid extensions and through the implementation of off-grid projects with RETs. It is expected that grid extensions will connect about 750,000 additional households (until 2012), will be implemented by the distribution companies through extension of the existing grid, and will be financed in part through the national fund FERUM, with resources principally from levies on commercial and industrial users. In addition, CONELEC and MEM are in the process of defining a rural electrification strategy (PLANER) to reach the areas far from the grid through off-grid decentralized projects with participation of private providers and promotion of RETs. The strategy includes assessment of financing mechanisms for the off-grid projects to ensure their long term sustainability.

Moreover, different pilot/demonstrative projects or programs for rural electrification have been designed and partially implemented in recent years. They predominantly focus in small-scale decentralized systems based on peak/mini-hydro or PV technologies. For instance, within the framework of the Peru-Ecuador Bilateral Technical Committee on Energy and Mining, a PV-based Rural Electrification Program (of US\$13.8 million) providing RET-based electricity to communities on both sides of the border has been implemented. Another example of interinstitutional cooperation: the MEM and the Ministry of Health jointly prepared a US\$0.45 million program for the installation of PV-based electricity systems for medical refrigerators in 94 remote clinics in the Amazonian region. Overall, the PROMEC program is implementing PV and peak-hydro pilot projects with underlying institutional & financial arrangements that ought to ensure the sustainability and replicability of decentralized RET-based systems in Ecuador.

Energy efficiency

The MEM leads an ongoing National Energy Efficiency Program aiming at (i) improving the energy efficiency of the power system itself; (ii) creating a culture of rational use of energy among the population; (iii) increasing industrial competitiveness; and (iv) protecting local and global environment. Program activities, funded on an important extent through 2 GEF Grants and the before mentioned PROMEC project, seek to (i) establish technical and financial mechanisms needed to promote efficient electricity end-use and, particularly, rational energy use and environmentally friendly practices in industry; (ii) remove legal, regulatory and/or institutional barriers for energy efficiency enhancement and create related incentives; and (iii) through local

capacity development, lay the basis for a sustainable and economy-wide energy conservation and efficiency program. Specific line of actions include:

- Review of legal, regulatory and institutional barriers to efficiency: issues such as tax treatment of efficiency investments, import and tariff treatment of equipment and instrumentation and overall availability of both equipment and technical services, adequacy of financing and utility incentives for support of energy efficiency are being systematically addressed. Ultimately, the preparation and adoption of a specific legal framework on energy efficiency has been targeted.
- Development of incentives and financing options: Assessments are being carried on a variety of incentive options including innovative electricity tariff design and other approaches to support efficiency, as well as evaluating the terms, conditions, general availability and cost of financing for efficiency investment. These also include the development of appropriate tool kits for market surveys and load studies to identify and quantify opportunities, and for cost/benefit analyses of efficiency investments. These tool kits shall assist in incorporating energy efficiency considerations into utility regulatory policy, distribution utility incentives, and into indicative least-cost generation planning.
- Efficiency Training, Technical Assistance and ESCO Support: The program contemplates to provide assistance for stakeholder involvement, as well as improving government policy and promotion capacity. Technical assistance and training will be directed toward major private sector end users and technical professionals in industry, commerce and electric utilities. In addition, the program plans to support the energy service industry (ESCOs), including through development of improved technical capacity, effective ESCO-type contracts and agreements, and interaction with potential international partners.
- Standards and Norms: Efforts to improve end use equipment purchase and replacement decisions are part of a specific program component, which is being carried on as part of an Andean region GEF-funded project. It includes including labeling to inform consumers of the life-cycle cost of new equipment (e.g. for air conditioners, refrigerators, lighting and motors) and encouraging upgrading the efficiency of products available in the local market through cooperative activities with local manufacturers or importers.
- Demonstration of Replicable Opportunities: A number of pilot projects have been and will be still undertaken oriented toward showcasing replicable opportunities, including: (i) ESCO and/or private utility cooperative programs for lighting improvement in the residential sector, and multi-end use energy efficiency in commerce/government buildings; (ii) public-private joint venture for improved municipal street lighting; and (iii) "strategic partnership" program with industrial and commercial organizations to support energy and environmental improvements (e.g. waste reduction, resource recovery, etc.).

Environmental management

CONELEC has implemented an action plan to improve the environmental considerations in the sector and to set an environmental management system that underlies the sector's activities. It has adopted a comprehensive Sector Environmental Regulation, which consists on a complete set of regulations and procedures for ruling the process of environmental evaluation, licensing and monitoring of electric activities in Ecuador. An Environmental Department within CONELEC, in charge of handling all sector environmental issues and interacting with all sector stakeholders, has been established and continuously strengthened. Mainstreaming of the environmental dimension in the electric sector operations has been satisfactory accomplished, although improvements in control tasks remain.

