RURAL ELECTRIFICATION IN LATIN AMERICA

July 2004

www.rurelec.com
Overview

- Rurelec PLC is a new company established to develop rural electrification projects in Latin America.

- It is managed by a team with a strong track record in developing power projects worldwide and with considerable experience in the electricity sector in Latin America.

- Rurelec will have two principal business objectives:
  - Ownership of power generation facilities in isolated areas, selling electricity to communities and local distribution companies on commercial terms; and
  - Management of the implementation phase of rural electrification expansion projects which connect outlying communities to a local, isolated electricity distribution system. Rurelec will not use its own capital for these projects which will typically be funded by the World Bank, donor countries or multi-lateral development agencies.

- Rurelec is floating on the AIM market in London in order to have access to development capital and to ensure transparency for its public sector-funded project management activities.
Geography
First Rurelec Projects

Initially Rurelec is to target Bolivia for its first projects.

- **Bolivia is the country with the lowest rate of rural electrification in Latin America.**
  - Over US$190 million of public sector funding from the international donor community has been committed to rural electrification projects in order to connect 200,000 new households by 2007.
  - Yet the Government of Bolivia has been unable to draw down much of the funds already committed as a result of the absence of private sector companies with the engineering expertise, project management skills and financial resources to supervise and implement those projects already approved. Rurelec intends to fill this gap.
  - The Directors of Rurelec have secured an option to acquire the entire issued share capital of Energia para Sistemas Aislados S.A (“ESA”) which owns a portfolio of power assets in Bolivia with a total capacity of 48 MW which are suitable for redeployment for isolated generation.

In addition to Bolivia, Rurelec will target Argentina, Brazil and Peru for its expansion in the Southern Cone of Latin America.
Market for Rural Electrification

In the poorer regions of developing countries, the provision of affordable and reliable electricity is one of the most important factors in

- improving the quality of life,
- creating new jobs; and
- promoting sustainable development in rural areas.

For this reason, governments and international development agencies alike have targeted rural electrification for priority funding.
Market for Rural Electrification continued...

- Isolated rural electrification schemes have all the technical and operating complexities of running an entire integrated national electricity industry. As a result there are few local private groups with the knowledge and resources to implement complete electrification schemes for regional generation, transmission and distribution on such a scale, even if funding is available and committed.

- Typically, local initiatives are based around local electricity co-operatives. These, however, are at best under-resourced and inexperienced and, at worst, not trusted by funding agencies to complete the necessary projects or to account fully for monies granted to them.
Bolivian Rural Electrification

- Bolivia has a land mass nearly twice the size of France but with a population of 8.5 million. 3 million people live in the largest cities.

- Communities are relatively small and spread out over such immense distances that it is impractical and uneconomic to run a national transmission system for electricity or for gas between the outlying areas. Instead, regional centres of population need to be provided with distributed power generation: small, independent power plants connected to a localised distribution network and serving only local towns and villages.

- In Bolivia, this has led to an imbalance in the provision of electricity for development. In 2004 only one in four rural households has access to electricity and 577,000 households out of the total of 764,000 households in Bolivia’s rural areas do not have electricity.
World Bank Programme for Bolivia

The Government of Bolivia has agreed with the World Bank a programme of poverty alleviation based on making electrification a national priority. This plan has four principal aspects:

- Construction of local isolated transmission grids for areas with no electricity;
- Roll-out of electricity connections for households in areas where there is access to electricity;
- Installation of new, local distributed generation capacity with an emphasis on renewable energy where possible; and
- Promotion of the productive use of electricity for local economic development and social stability.
Public Sector Donors and Lender to Bolivia

The Government of Bolivia’s Rural Electrification Plan is supported with US$190 million funding committed by the following international organisations and governments:

- CAF  Corporacion Andina de Fomento
- UNDP  United Nations Development Programme
- GEF  Global Environment Fund
- USAID  United States Agency for International Development
- NRECA  National Rural Electrification Cooperatives Association
- IDB  Inter-American Development Bank
- KfW  Kreditanstalt fur Wiederaufbau of Germany
- Government of Canada
- Government of Spain

The bulk of money committed to date by the above agencies and governments will be used for the wires element of electrification projects.

New power plant generation capacity is to be provided and installed by private sector companies like Rurelec developing standalone independent power projects (IPPs) on commercial terms.

The development of investor-owned and operated IPPs is a business with which the Directors of Rurelec are very familiar. Rurelec is therefore making the development and ownership of small power plants serving isolated areas a key part of its business strategy.
Energy Industry Trends

The Directors believe that a number of trends in the energy industry are creating a need for small, moveable power generation units to create electricity and heat for rural areas in the developing economies. These are the trends towards;

- increased energy demand,
- distributed power generation; and
- cleaner energy.
Trend to Increased Energy Demand

In emerging markets, it has become a rule of thumb in the power industry that demand growth for electricity increases at roughly twice the rate of growth of GDP in the economy.

- Bolivia’s GDP is expected to grow in 2004 by over 4 per cent. This has already resulted in an electricity demand growth of over 9 per cent since January 2004 in the Eastern interconnected system that comprises Bolivia’s national grid.

- Statistical data is typically not available for isolated areas since constraints on generation capacity have place artificial limits on demand growth. The backlog of unsatisfied demand for electricity in the rural areas needs to be met before potential growth in demand can be realised.
Historically, power plants in both the industrialised and the developing world were built, owned and operated by governments. Since 1990 and the ground-breaking privatisation of the British electricity industry, governments worldwide including those in Latin America have both privatised their state-owned power plants and devolved the creation of new plants to the private sector.

Privately owned IPPs are now tailored to the local market conditions and are typically smaller.

Distributed power projects, such as those to be pursued by Rurelec, are particularly important for the development of rural electrification for the following reasons:

- The high capital cost of building long distance power transmission lines linking small centres of demand can be avoided.
- Transmission losses from sending electrons hundreds of kilometres between outlying areas can also be avoided.
- Construction times for smaller independent plants are shorter than those for large wholesale power plants on a national grid.
- Distributed generation plants on a simple local system are easier and cheaper to operate than complex plant operations connected to a national grid.
Climate change has become central to energy policy worldwide since targets for the reduction of global emission of greenhouse gases and carbon dioxide will only be achieved by improvements in the efficiency of power generation. In the UK, eighty per cent. of greenhouse gas emission reductions is expected to come from the power sector but the same trend to cleaner energy is taking place in the developing world. Here one of the most important driving forces for cleaner energy is the availability of carbon credits under the Kyoto Protocol from the developed world which subsidise clean energy projects in developing economies.

In the case of isolated generation projects, the use of carbon credits is linked to sustainable energy projects which use renewable fuel sources. Solar and hydroelectric projects can be both expensive and seasonal for rural communities. A new trend, however, is the use of renewable fuel crops - or bio-fuels - for small generation plants where the fuel source is grown locally and used locally. Such projects not only attract carbon credits but are also an important factor in the creation of jobs in regional agriculture.

Rurelec intends to pursue, wherever possible, clean energy projects linked to sustainable development.
Rurelec Plan for Bolivia

Funding for rural electrification is available but:

- Both the international donor community and the Government of Bolivia are looking for reliable partners in the private sector.

- Some of the international grants and loans obtained for this purpose are being lost through not being drawn.

- ENDE, the state-owned power company, does not have the resources or the technical capabilities to carry out new projects.

- Existing Isolated Systems run by ENDE are losing money through inefficiency and the use of worn out machines.

Rurelec intends to draw together and manage the elements required to unlock funding and expand the provision of power in rural areas
Rurelec Plan for Bolivia continued...

Rurelec intends to invest in New Generation Capacity. The Plan is:

- To replace existing motors that require expensive fuel – the current cost of ENDE generation is US$0.08 Kwh or more.
- To install units with lower cost of generation – US$0.05 Kwh or less.
- To add new generation units as distribution expansion comes on line.
- To enter into long term contracts with distribution companies and municipalities using Project Finance techniques to enhance credit-worthiness of contracts.
- To manage public sector funded improvements in local billing systems and introduction of efficiency measures in the donor funded wires businesses.
Rurelec Plan for Bolivia continued...

Project Implementation

- The principal Rurelec investment activity will be generation of electricity: other tasks will be performed under Rurelec supervision by local and international companies with relevant experience in their respective areas.

- Rurelec will ensure transparent accountability of all publicly funded rural electrification projects.

- Bolivian distribution companies such as CRE, Electropaz and ELFEC have expressed their interest in becoming local partners for rural electrification projects.

- The Government of Bolivia has also indicated its strong wish to see the Rurelec Plan implemented as soon as possible.
Conclusions

- Rurelec plans to be the principal supplier of electricity in isolated systems and rural areas of Latin America.
- It is structured to access qualified managers and engineers from Guaracachi and the Independent Power Corporation in order to keep its overheads low.
- Rurelec will provide capital and supervise the wider rural electrification programme in partnership with specialist companies.
- Rurelec will form strategic alliances with:
  - National and Local Governments; and
  - International financial institutions; and
  - Regional distribution companies.
Conclusions continued...

- Rurelec has the expertise to finance, implement and operate rural electrification projects.

- Rurelec has access to the financial resources required.

- Rural electrification in Bolivia is below the Latin America average but is of very high political importance.

- Rural electrification in Latin America has had public sector funding committed for new projects but lacks companies such as Rurelec to supervise its implementation.
APPENDIX 1

BOLIVIA ADDITIONAL INFORMATION
Bolivian Interconnected System

Power Plants
- Guaracachi
- CORANI
- V.Hermoso
- COBEE

Distribution Comps.
- Electropaz
- ELFEO
- ELFEC
- CRE
- SEPSA
- CESSA
Rural Electrification in Bolivia: Coverage 2001

- Total number of households in rural areas: 764,000
- Households with Electricity: 187,000 - 24.5%
- Households without Electricity: 577,000 - 75.5%
Electrification Coverage in Bolivia

<table>
<thead>
<tr>
<th>Year</th>
<th>National Coverage</th>
<th>Rural Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1976</td>
<td>32.0%</td>
<td>7.8%</td>
</tr>
<tr>
<td>1992</td>
<td>46.1%</td>
<td>12.0%</td>
</tr>
<tr>
<td>1997</td>
<td>45.8%</td>
<td>13.7%</td>
</tr>
<tr>
<td>2002</td>
<td>64.4%</td>
<td>24.5%</td>
</tr>
</tbody>
</table>

- Coverage is below the Latin American average.
- 1992-2007: Growth as a result of the electricity privatisation, local government spending and investment made by the international community.
Bolivian Rural Electrification Plan

Bolivia’s Electricity Law No. 1604 (1994)

**ARTICLE 61:**
- The Government has responsibility for developing electrification in smaller populations as well as in rural areas that cannot be taken care of exclusively by the private sector.

**OBJECTIVES:**
- Help facilitate the economic and social development of the rural areas.
- Improve the quality of life in the rural areas.
- Create more jobs.
- Help to increase productivity.

**GOAL:**
- 200,000 new connections in rural areas over a period of 5 years and with an estimated cost of US$ 200 million.
Bolivian Rural Electrification Plan continued...

- Grid construction for areas without electricity.
- Connection of households in areas with electricity.
- Emphasis on Electricity from renewable energy – solar, wind and hydro.
- Promotion of productive use of electricity.

Energy is an important factor for development and poverty alleviation.
## Financing Committed to Rural Electrification

<table>
<thead>
<tr>
<th>ENTITY</th>
<th>STATUS</th>
<th>US$ m</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAF</td>
<td>Under Execution</td>
<td>34.00</td>
</tr>
<tr>
<td>UNDP/GEF</td>
<td>Under Execution</td>
<td>3.00</td>
</tr>
<tr>
<td>WB</td>
<td>Approved</td>
<td>13.80</td>
</tr>
<tr>
<td>USAID/NRECA I</td>
<td>Under Execution</td>
<td>8.40</td>
</tr>
<tr>
<td>CANADA</td>
<td>In process</td>
<td>0.04</td>
</tr>
<tr>
<td>KfW</td>
<td>Approved</td>
<td>5.50</td>
</tr>
<tr>
<td>Spain</td>
<td>Approved</td>
<td>10.00</td>
</tr>
<tr>
<td>Spain 2</td>
<td>In process</td>
<td>16.00</td>
</tr>
<tr>
<td>USAID/NRECA II</td>
<td>Approved</td>
<td>4.00</td>
</tr>
<tr>
<td>BID</td>
<td>In process</td>
<td>30.00</td>
</tr>
<tr>
<td><strong>Total External Resources</strong></td>
<td></td>
<td><strong>124.70</strong></td>
</tr>
<tr>
<td><strong>Local Government</strong></td>
<td></td>
<td><strong>67.00</strong></td>
</tr>
<tr>
<td><strong>Total Amount Committed</strong></td>
<td></td>
<td><strong>191.70</strong></td>
</tr>
</tbody>
</table>