



# Renewable Energy Jobs & Access

A SERIES OF CASE STUDIES

## Guatemala Hydro

### PROJECT PROFILE

Hydro Company B, a Guatemalan private company, upgraded and revitalised an existing 400 kilowatt (kW) plant to 1.1 MW. It is located in the municipality of El Rodeo (36 000 inhabitants) in the Department of San Marcos (total population of about 800 000). The project will generate approximately 5.7 million kilowatt hours (kWh) per year.

Hydro Company B is planning to undertake feasibility studies for additional hydro projects in Guatemala.

Guatemala's state-owned utility INDE (Instituto Nacional de Electrificación) has promoted the connection of isolated small hydro plants into the national grid. The Ministry of Energy and Mines has also promoted a series of private sector incentives for renewable energy development, including exemptions from income tax, machinery import tax, as well as freeing carbon credits from taxation. These policies created an enabling environment for the development of hydropower in Guatemala.

### JOBS AND TRAINING

The total workforce at the hydropower plant comprises 14 persons. All are Guatemalan nationals and thus their salaries directly benefit the local economy. This comprises one manager, three engineers, and ten operator/administrative/support staff.

The project manager is a professional engineer and project developer. His technical team includes civil and electrical engineers with experience in building and operating hydroelectric projects. The remaining staff received on-the-job training from the manager and engineers.

Support staff and operators earn USD 200-300 per month, with a higher rate for operators than for administrative staff. No salary information is available for the manager and engineers. However, an estimate for the engineers is that earnings are 15-20% higher than those of operators.

In 2008-2009, 96 workers were hired from the community when the plant was constructed. These were temporary jobs, however, and employment ended when the plant was completed.

The company does not provide formal medical insurance. However, it does pay for employees' medical treatments as the need arises. The company provides 21 days of paid vacation and three paid sick days per year to full time employees.

### SUPPLY CHAIN

#### Upstream Linkages

The company bought the turbine and other electromechanical equipment from an Italian-owned company manufacturing in Guatemala. The total value was more than USD 800 000. Construction materials for the initial infrastructure for the facility (including wood, steel, cement, etc.) were purchased locally.

#### Downstream Benefits

A local coffee farm is the major business customer for the hydro plant. This represents an upgrade of energy supplies for the coffee farm, rather than supplying additional amount of energy. Therefore, no additional economic activity has resulted.

Because it is virtually impossible to trace the point of power generation origin to the specific households that use grid-electricity, only generic observations are possible with regard to any community downstream linkages beyond the coffee farm. However, with a more reliable supply of energy, shopkeepers are able to operate their businesses





## PROJECT SNAPSHOT

The project in southern Guatemala expanded the capacity of an existing run-of-the-river hydroelectric plant to 1.1 MW. The facility, located in the municipality of El Rodeo, is connected to the Guatemalan national power grid.

- » **Technology**  
Hydropower
- » **Employment**  
14 persons total workforce; 96 laborers during plant construction

## COUNTRY INFORMATION

- » **Population**  
14.4 million people
- » **GDP/capita**  
USD 2 862
- » **Electrification rate**  
80.5% average  
68% rural  
93.7% urban
- » **Access to modern fuels\***  
45.2%

*The data from the case study was provided by E+Co. Population and GDP data are from the World Bank Indicators (<http://data.worldbank.org/indicator/>). Energy access data from United Nations Development Programme and World Health Organization (2009) report, *The Energy Access Situation in Developing Countries: A Review Focusing on the Least Developed Countries and Sub-Saharan Africa*.*

*\* Modern fuels refer to electricity, liquid fuels, and gaseous fuels such as LPG, natural gas and kerosene.*

past dark. This includes small snack shops, restaurants, or bars, as well as micro-enterprises like barber shops and tailors.

Among local households, better access to energy improves the quality of life and allows children to read and study longer. Reduced use of kerosene, candles and batteries saves families money, which can be spent to greater benefit the local economy.

## FINANCING

Total project cost was USD 1.54 million. E+Co provided a loan of USD 1.1 million to fund 72% of the total cost. The remaining 28% of the investment cost (USD 437 650) was covered by the company itself, which also invested USD 286 000 for feasibility studies.

The project has a cost of USD 1 398 per installed kW, a rate judged to be competitive for Central America.



The Policy Advice and Capacity Building Directorate (PACB) welcomes your comments and feedback at [pcb@irena.org](mailto:pcb@irena.org).

These local case studies were prepared by IRENA in cooperation with the organisations described. They intend to explore the employment dimension of renewable energy development and deployment in rural areas in the developing world. For a more detailed version of this case study, please see IRENA (2012), *Renewable Energy Jobs and Access*, which is available at:

[http://www.irena.org/DocumentDownloads/Publications/Renewable\\_Energy\\_Jobs\\_and\\_Access.pdf](http://www.irena.org/DocumentDownloads/Publications/Renewable_Energy_Jobs_and_Access.pdf).

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