

Betim, Brazil

Energy Company of Minas Gerais delivers electricity to a low-income community, with the support of CRER-Betim



Parque do Cedro, a borough in Betim (Minas Gerais), did not receive registered or formal electricity supply. A change was brought about with the support of CEMIG (Energy Company of Minas Gerais), motivated by the municipality's Renewable Energies Reference Center (CRER). The formalization of energy went hand-in-hand with environmental education to raise community awareness in the borough on efficient energy consumption.

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Summary

The settlement of the borough of Parque do Cedro in Betim (Minas Gerais) was not created in accordance with legal regulations. As a result the 400-plus houses built by its low-income population did not receive official and regulated urban infrastructures, including basic services, such as electricity, water and sewage systems. Based on an agreement between the Energy Company of Minas Gerais (CEMIG) and the Municipality of Betim, an effort was initiated to make the community's housing, and subsequent installation of an electricity network, formal and compliant with regulations.

CRER is a partner in the follow-up work to obtain and analyze consumption data and to assess the achievements that took place in the borough. The information will be analyzed and discussed by CRER's Advisory Group (AG) as a way of building future strategies. There are no comparative figures yet, but CEMIG is confident it will achieve significant energy savings from now on in Parque do Cedro.

Opportunities to strengthen the partnership between CRER and CEMIG are expected, including possibly installing solar water heaters during an eventual second phase in Parque do Cedro, as well as replicating the project in other communities with similar characteristics.

Saving potential: Installing legal energy services in Parque do Cedro

There are several communities such as Parque do Cedro where legal access to electricity did not exist prior to initiatives taken by the Municipality and CEMIG. Many houses in such communities receive energy through unregistered or informal connections. CEMIG estimates that the monthly energy consumption for these families is 350 kWh, well above the average consumption for families on the same income level using public utility services. This difference is likely due to a lack of awareness and incentives to use energy efficiently. After all, these households do not pay for their unregistered and unauthorized electricity connections. The estimated annual loss due to unregistered or illegal electricity connections in Brazil is R\$7.8 billion (€ 3.3 billion).

Over 80 percent of the world's energy is consumed in cities and it is estimated that 60-90 percent of cities' greenhouse gas emissions come from the use of



Population / Land Area

Approx. 435,000 / 346 km²

Municipal Budget

Approx. 1.15 billion BRL (2009)
(€ 520 million EUR)

Local economy

Automotive industry, petrochemicals

Role of city in region

Fast-growing city within state capital metropolitan region

Betim joined ICLEI in March 1998.



An ICLEI Initiative

ICLEI supports and strengthens local governments which promote the generation and supply of renewable energy and energy efficiency in the urban environment.

fossil fuels in energy generation and transportation. But cities can also be part of the solution, hundreds of cities and local governments worldwide have adopted targets, incentive policies, urban planning initiatives, among other practices, aimed at energy efficiency and the promotion of renewable energy.

The Betim context

Located 30 km from Belo Horizonte, the Municipality of Betim is part of the Metropolitan Region of the state Minas Gerais. Betim has the second largest budget in Minas Gerais after Belo Horizonte and is among Brazil's 18 largest economies. Betim's remarkable economic prosperity and strong industrial sector have attracted migrants to the area in search of more promising lives.

Population growth has resulted in serious environmental implications such as creating informal or unregistered boroughs. Those who live outside the legal system, are unable to take advantage of incentives for sustainable land management and sustainable energy consumption.

Energy consumption in Betim is quite high at 2.95 GWh per year. Developing energy efficiency and sustainable energy strategies is crucial for the city to grow in a more sustainable way.

Betim joined ICLEI's Cities for Climate Protection (CCP) campaign in 2002 and made strides in the field of renewable energy, particularly with the progressive use of solar power in low-income communities. Betim's leadership role prompted the ICLEI Latin America and Caribbean Secretariat team in Brazil to designate Betim the first Local Renewables Model Community in Brazil in 2005, and continued to work with the city during the project's second phase between 2008 and 2010.

Case Study

Parque do Cedro: Legal energy leads to energy savings

The region of Parque do Cedro, located in the northeast Betim, was divided into small ranches in 1980. In the mid-1990s pressure from the real estate market caused the plots to be split into smaller units. Since the land is located in an environmentally protected area, the new land division was not approved by the government. Despite this, market pressure led to the sale of the unregistered and undocumented small settlement lots even though legal ownership rights were denied.

Since the occupation of these plots occurred, more than 400 unauthorised or 'unregistered' houses have been built by a population of about 1,500 people belonging to "D" and "E" income earning classes. These houses have never benefited from any formal urban infrastructures. This population has never had the opportunity to legally access utilities including electricity, water and basic sanitation services.

The borough is now registered and receives legal electricity network. This situation began to change once the local community presented the issue to the original landowner, the Municipality of Betim and CEMIG, to search for solutions. In October 2007, the Municipality of Betim's Master Plan was changed with Law no. 4574 that legally defines Parque do Cedro an area of social, urban and environmental interest. This allowed for government investment in the borough.

The Municipality was required to sign a concession term taking responsibility for the degradation of unoccupied environmental preservation areas surrounding the houses, and also guarantee that the allotments would not expand further. As a result, the City Administration clearly defined street locations, allowing Parque do Cedro residents to obtain a proper street address for the first time, an important step toward social inclusion.

With these changes, CEMIG could fulfill its part of the agreement with the City Administration and installed the electricity network in Parque do Cedro. One hundred percent of households in the borough were registered to receive electricity network infrastructure. The first phase of the installation, which covered 80 percent of 400 houses, was completed by May 2010. The remaining houses will receive electricity during a second phase, which should be completed by the end of 2010.

Measurements and results

Based on studies carried out in communities facing similar circumstances, CEMIG estimates Parque do Cedro families consumed 350 kWh per month prior to the installation and education of the sustainable energy program. The first electricity bills after installing the legal energy network arrived at the beginning of June 2010. According to CEMIG, it will be necessary to wait for a three-month cycle



Photo: Municipality of Betim

Illegal connections - 'Gatos' - in Parque do Cedro

to conduct a more balanced analysis of the results. Even though comparative figures are not yet available, CEMIG is confident that there will be significant energy savings in Parque do Cedro.

The role of CRER Betim. CEMIG's activities in Betim have been conducted through a continuous partnership with the Municipality's Renewable Energies Reference Center (CRER). CRER, of which CEMIG is a part, has been able to influence participants of its Advisory Group (AG), whose members are influenced to incorporate energy efficiency issues and the use of renewable energies into their agendas.

CRER's work in Betim

The Renewable Energy Reference Center (CRER) in Betim was established with a mission to incorporate renewable energy services in local development and be a center of information and dissemination of technologies and projects in renewable energy to inspire public policies and actions in other cities. CRER is a key element of Betim's involvement in the Local Renewables project.

For more information on the establishment of the CRER in Betim, please see ICLEI Case Study #105.

The Local Renewables project

The Local Renewables Model Communities Network (or Local Renewables project) aims to support and strengthen local governments in promoting sustainable energy and to become model cities in their national and regional contexts. This international project (2005-2010) connects leading cities to cooperate in sharing their expertise and experience in the fields of renewable energy (RE) and energy efficiency (EE). Thus, the project is a key component of ICLEI's Local Renewables Initiative.

Special support for participating model communities in India (Bhubaneswar, Nagpur and Coimbatore) and Brazil (Betim and Porto Alegre) was possible due to generous funding from the German Federal Ministry for Economic Cooperation and Development (BMZ) through the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH.

The European Resource Cities of Bonn, Freiburg, Milan, Växjö and Malmö have highly developed renewable energy and energy efficiency strategies which they were happy to share.

The ICLEI offices for South Asia (Delhi), Brazil (Sao Paulo) and Europe (Freiburg) were giving continuous guidance and organized the exchange among the cities.

www.iclei.org/local-renewables

This mechanism was useful in Parque do Cedro's community awareness program and donations of energy efficient equipment. According to CEMIG, in the majority of municipalities, CEMIG must make the first contact when they would like to begin a project, but Betim is more proactive. In the case of Betim it is the opposite, the city usually contacts CEMIG about new ideas for projects. Due to CRER-Betim's ongoing support, CEMIG has deepened its ties with the city's communities and has brought legal electricity to Parque do Cedro.

CRER is also recognized by the local community as the reference point to receive advice and information on solar energy and energy efficiency. According to CRER-Betim, the Center often receives calls from low-income community members asking for guidelines on energy efficiency and installation of solar heaters. Parque do Cedro's inhabitants have also approached CRER for information and as a result has become more aware of these issues.

CRER is interested in conducting a comparative analysis between the savings generated by the solar water heater and the heat recovery exchanger system. The comparison would be done between houses in Parque do Cedro that do not yet have solar heaters - but who have heat exchanges - with other low-income communities that already have the heaters. This study will serve as a reference for CEMIG's future projects in the entire region.

Results of legalizing energy access

- The legal/institutional solution applied in Parque do Cedro may be used for the regularization of energy in other communities.
- CEMIG installed a legal electric network for 400 homes that were previously marginalized and off the legal grid.
- The local population was made aware of efficient energy consumption through environmental education programs.
- Through the activities in Parque do Cedro, CRER has become a credible local reference point on sustainable energy.
- CEMIG provided all of the borough's houses with individual energy measures as part of its community education population. The company also donated compact fluorescent lights to all the residences. After mapping local consumption, the company intends to donate efficient refrigerators or shower-heat exchangers, that reuses heat from the water being used, to families with high energy consumption and/or lower income level.
- A discount in energy rates was granted in alignment with CEMIG's social tariff rates based on income earnings.
- CRER is also lobbying to install solar water heaters in Parque do Cedro during the project's second phase. If this were to happen, CRER would lead awareness-raising efforts prior to their installation. Due to its experience, CRER may also provide training for the local population on how to build a low-cost solar water heater - a course they have developed and implemented elsewhere.
- CRER will be a partner in monitoring consumption data and analyzing the results of the renewable energy and energy efficiency actions carried out in the borough. All of the results will be viewed by CRER's Advisory Group for analysis and planning of future strategies.

Lessons learned

Formalization: Communities and their inhabitants such as Parque do Cedro are eager to register for legal utilities. This benefits energy companies who receive payment for the services provided and who are able to advance energy efficiency initiatives and safe energy supply strategies.



Photo: Municipality of Betim

Installation of the Electric Network

Social Inclusion: The borough is now registered and receives a legal electricity network.

Measuring: Measuring energy consumption is an essential tool for communities' education and planning, as well as encouraging residential energy efficiency.

Proactive: CRER has influenced important stakeholders to foster energy efficiency and renewable energy in the region, such as CEMIG. CRER's elevated status has provided the Center with several new opportunities, such as the ones mentioned throughout this case study. CRER must recognize its new position and be proactive in order to take advantage of opportunities that come its way.

Replication

CEMIG and Minas Gerais Sanitation Company (COPASA) met in 2010 to discuss the possibility of providing basic sanitation infrastructure in Parque do Cedro. The issue was still being deliberated among all parties as of June 2010. Stakeholders of this project view the Parque do Cedro experience as an important reference point. The project's replication in other boroughs is expected and is already underway in Alto Cruzeiro. This will provide an opportunity for CRER-Betim to become actively involved in the community environmental education work at the beginning of the project and encourage the population to consume energy more efficiently.

The process followed for registering legal electricity services in Parque do Cedro can be replicated in other low-income communities throughout the world. CEMIG's installation of the electricity network and environmental education work can also be replicated by electricity providers in Brazil and beyond.

Rede Elo and CRER-Betim

ICLEI's Rede Elo was developed in order to create a link between local governments that lead the promotion of renewable energies (RE) and energy efficiency (EE) in urban centers. The Brazilian Model Communities which are part of Rede Elo include Betim (MG) and Porto Alegre (RS), as well as others that participate in the network as satellite cities.

Each Model Community is dedicated to developing sustainable energy policies, involving the community in sustainable energy, establishing a sustainable energy reference center, involving neighboring local governments, as well as promoting and implementing of RE and EE projects and laws.

Betim's Renewable Energies Reference Center (CRER), created in 2006, is mandated to incorporate RE and EE services in local development initiatives and be a center for information-sharing about technologies and projects in order to inspire public policies and actions in other cities.

Each CRER has an accompanying Advisory Group comprised of stakeholders from different sectors of society. This participatory process helps local governments implement sustainable energy plans.

www.crer.betim.mg.gov.br

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Photo: Municipality of Betim

Parque do Cedro

Sources

- CRER - Betim and Municipality of Betim

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- This case study is also available in Portuguese.



Local Renewables project materials for Brazil

Case Study # 105: The Renewable Energy Reference Centre: Engaging stakeholders in renewable energy applications; Betim, Brazil

Case Study # 106: Cooking oil waste is used in community development with the Eco-oil Programme; Volta Redonda, Brazil

Case Study # 107: Turning pollution into profit: the Bandeirantes Landfill Gas to Energy Project; Sao Paulo, Brazil

Case Study # 112: Solar heaters in low income housing: Energy and financial savings in Betim

Case Study # 113: Stakeholder involvement groups for Local Renewables in Betim and Porto Alegre

Case Study # 114: Portuguese: Energia Solar é Incentivada em Lei sobre Compensação Vegetal em Porto Alegre

Case Study # 115: Portuguese: Cemig leva Energia Elétrica chega à a comunidade de baixa renda com apoio do CRER Betim

Further case studies about energy efficiency and renewable energy in India, Brazil and European, as well as city completion reports for the Local Renewables project are available on the project website. www.iclei.org/local-renewables

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