

Untapping Bolivia's energy efficiency potential

Following a successful initial phase, NIRAS IP Consult is continuing its work to increase renewable energy and enhance energy efficiency in Bolivia through organisational cooperation and consultancy as well as educational measures in the field.



Cinthya Berrio
Project Manager Energy
& Climate Change
T: +49 0711-896905
cbb@niras.com

In this day and age, there is no doubt that transitioning towards renewable energy is beneficial not only for our environment but also to fuel economic growth, create new job opportunities, and improve human living conditions. For an emerging market like Bolivia, which produces 70% of its energy from the burning of fossil fuels, moving toward a renewables-based energy system offers great potential for environmental sustainability and energy security.

On behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ), in 2017 GIZ launched the Renewable Energies Programme (PE-ERR) to expand and improve availability of renewable energy and increase energy efficiency in the Latin American nation.

Great potential

In general terms, Bolivia is among the poorest performers in the region in terms of efficiency in energy consumption. Apart from private sector initiatives – with programmes promoted by international cooperation and others supported by the state – there is still a long way to go in improving energy performance. Particularly, the development of a regulatory framework and strengthening of energy sector institutions are critical to future success, as has been demonstrated in almost all countries in the region.

In this context, it is necessary to promote the development of sectors, such as the industrial and commercial sectors, where there is greater potential for the introduction of energy efficiency measures and the promotion of technological innovations that enables them to reach new competitive horizons.

With over 15 years of experience working on development cooperation projects in Bolivia, NIRAS has been a central part of the PEERR project supporting the Ministry of Energy in increasing energy efficiency and fostering initiatives and educational measures in the field.

Establishing the organisational framework

During the first phase of the project, NIRAS devised a concept for an Energy Efficiency Agency and developed energy efficiency guides for a nationwide implementation of cost-efficient energy efficiency measures. Since 2017, we have been providing organisational consultancy to the Bolivian Vice Ministry of Electricity and Alternative Energies (VMEEA). We have also advised on the design and implementation of the National Energy Efficiency Strategy as well as an energy audit programme in public buildings.

A web platform for deployment of information

Affecting long-term change in a complex field like energy efficiency requires meticulous and continuous monitoring. A significant milestone was reached in a workshop in May where key energy sector players came to an agreement on which indicators to measure, report and verify regarding energy efficiency. This will enable continuous measurements of progress and allow for timely adjustments of initiatives going forward.

In addition, NIRAS will pilot a system to register, monitor, report, and verify energy performance indicators for public infrastructure. To facilitate this, the project team is designing a web platform for the VMEEA, based on a database they compiled of 1600 buildings related to, for example, location, built surface, energy consumption, energy expenditure, etc.

This will effectively enable VMEEA to evaluate the current state of energy consumption, measure progress, and make appropriate adjustments to public programmes and policies.

Furthermore, based on preliminary audits, the project team has developed energy efficiency measures for public buildings and audit programmes. Going forward, NIRAS is in charge of delivering an analysis of efficiency potentials in Bolivia's industrial sector as well as for water supply services. We will also provide

Donor

Federal Ministry for Economic Cooperation and Development through German Development Cooperation (GIZ)

Client

Vice Ministry for Electricity and Alternative Energy

Location

Bolivia

Contract value

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(phases 1 and 2)

Duration

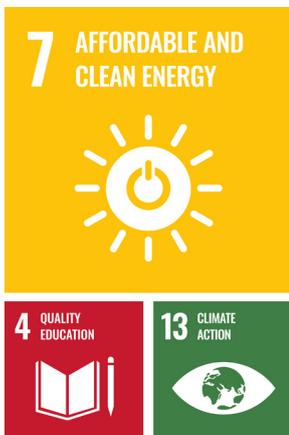
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“We will ensure that universities and schools train the future workforce to install and maintain renewable energy technologies as well as tap international funding for renewable energy and energy efficiency investments.”

Rolf Sielfeld, PEERR Team Leader of action fields 3 and 4

Team leader Rolf Sielfeld (4th from the bottom left) and participants of the training on energy efficiency in housing construction.



Targeting yet another core NIRAS expertise, the project aims to promote women’s participation in the energy sector. The PEERR team supports GIZ in strengthening the Gender-Energy Community with various conferences, debating different energy topics and creating knowledge together for the benefit of women in the energy sector.

recommendations on efficiency enhancement measures, their prioritisation, as well as funding and financing mechanisms. As a specific example, NIRAS is in charge of the establishment of an energy management system for the Bolivian cable transport company, Mi Teleferico, and is identifying opportunities to optimise their use of electrical energy.

Geographic considerations in home construction

Like many countries in Latin America, the climate varies significantly from one area to another. Densely populated areas are either located in tropical lowlands or Andean highlands, and yet housing projects have been constructed uniformly nationwide, causing most buildings to need year-round air conditioning or heating.

The construction solutions should instead respond to the objective of providing optimum conditions of thermal comfort and interior air quality and minimising the energy demand for heating and cooling. This is easier said than done, considering its application in six climatic zones and three different types of housing.

In an effort to meet this complex objective, project team leader Rolf Sielfeld has conducted technical training courses with Bolivia’s state housing authority (AE Vivienda), covering topics such as climate, thermal comfort and air quality, heat transfer, and insulation technologies, as well as exercises on how to construct sustainable proposals on social housing in Bolivia. The courses were complimented by practical training sessions with an international expert on the use of computerised energy simulation tools to assess the most cost-effective solutions.

Durable solutions through education

Based on a comprehensive analysis of the labour market and Bolivian demand for specialists in the renewable energy and energy efficiency field, the project team focuses on promoting educational initiatives. NIRAS advises universities and technical vocational

schools on establishing and further developing their curricula, as well as designing and implementing hands-on training for teachers in the fields of photovoltaic, wind energy and high energy performance buildings. Starting in 2020, NIRAS is contributing to the adaptation of a representative amount of modules to be delivered digitally via webinars and online availability of internationally recognised specialists’ material for knowledge transfer.

More than 100 Bolivian specialists have been trained in renewable energy and energy efficiency (including photovoltaic, wind energy and energy efficiency in buildings). By 2022, that number will be over 200.

On behalf of GIZ, NIRAS has designed photovoltaic systems for research and training purposes for universities and institutes, promoting practical learning as well as providing a theoretical basis and tools for the design of facilities that enable improved teaching methods.

In cooperation with the German-Bolivian Chamber of Commerce and Industry, NIRAS will deliver an internationally accredited course for energy managers that will be anchored in a nationally recognised institution.

These educational measures are crucial to ensuring durable solutions, not only by securing the sector’s future workforce, but also by enabling the country to tap into international funding for future investments. PEERR solutions will thus allow Bolivia to reap job opportunities and additional economic and environmental benefits of increased renewable energy and energy efficiency.