foundation
elecnor

2015 ACTIVITY report

Social infrastructure projects

Training and research projects

2008-2015: other projects during the last seven years of working to make the world a better place

In 2015 the Elecnor Foundation oversaw the further progress of the Social Infrastructure projects implemented in recent years in countries such as Chile, Uruguay and Ghana. At the same time, and in keeping with the company's environmental and social commitment, the foundations were laid in Latin America and Africa for the implementation of its H_2OMe system. These efforts were duly rewarded with the project's recognition in the Large Companies category of the 2015 Co-Responsibility Awards. In addition, the Foundation maintained its commitment to Training and Research, with the main new development being the launch of the First Laboratory of Ideas on Renewable Energies, which brought together some of the leading lights in the sector

The H_2OME system reaches Angola

H_2OME is a cutting-edge project designed as an energy-efficient "multi-functional sustainable module" to supply drinking water and offer multi-purpose spaces. In 2015, the Foundation made significant progress in its efforts to establish the system in environments with special water supply needs: following intensive investigations and technical research the municipality of Gove in the Angolan province of Huambo was chosen as the first location for the H_2OME system in Africa

H_2OME is built using former shipping containers, which are recycled and used to build a mobile structure that can be transported and installed anywhere worldwide, in particular in locations where there is limited access to water fit for human consumption.

The system consists of a variable number of containers on two levels: a lower level containing a water purification unit and an upper level with a large multifunctional, open space for activities of benefit to the community. If there is no access to the power grid, H_2OME uses photovoltaic power to cover the project's energy requirements.

In 2015 the Foundation continued to look at potential sites

for this technology in several countries in Latin America and Africa. An outstanding example where work is already underway is Angola, and more specifically Gove (Huambo province), where water was identified as being in short supply. A preliminary design was then created which was followed by feasibility studies (basic engineering) and finally the detailed engineering for the first H_2OMe site in Africa.

The aim of the project, which will be operational towards the end of 2016, is to purify and distribute water from the Gove hydroelectric plant so that residents have quick and easy access to a commodity essential for their nutrition and health. Each person will have access to an average of 50 litres per day.

This H_2OMe installation will be built in five 40-foot high-cube containers. They will have the following functions:

10,000 POTENTIAL BENEFICIARIES

SUPPLYING 50 LITRES OF WATER PER PERSON PER DAY

THE ANGOLAN MUNICIPALITY OF GOVE WILL BE THE SITE OF THE FIRST H_2OMe SYSTEM IN AFRICA

1. Water purification unit
2. Accommodation of the manager of the system, also serving as an office and store.
3, 4 and 5. These will be linked to form an approximately 90 m² multi-purpose audiovisual library.

In addition, a children's park will be installed in the area of the H_2OMe.

H_2OMe, Co-Responsibility Awards in the Large Companies category

Thanks to its unusual characteristics and social usefulness H_2OMe garnered what is probably Spain's most prestigious sustainability accolade: a 2015 Co-Responsibility Award in the Large Companies category.

To win recognition in the Co-Responsibility Awards, which were conferred for the sixth time in 2015, H_2OMe beat off competition from around 300 rival projects by the leading companies and foundations not just in Spain but also in Latin America, since the scope of the competition was extended to the Americas for the sixth edition.

It is not the first prestigious award that H_2OMe has claimed. In 2014 it was named one of the "100 Ideas of 2013" by the business publication Actualidad Económica within the "Sustainable Ideas" category. This was the 36th edition of these awards, which recognise the work of companies in innovation and gather together the most useful and innovative products and services launched in the past year.

Alliance with Plan International

In 2015 the Elecnor Foundation and the child rights advocacy organisation Plan International Spain agreed to work together on international projects to improve access to water and energy in developing countries

Plan International Spain is currently involved with renewable energy projects in countries such as Mali, where work is underway to improve access to quality energy through the installation of solar panels in rural environments that will benefit around 20,000 people. The electricity will be used to illuminate schools and health centres, to power a solar kiosk where batteries can be charged, thus improving access to communications, and to operate pumping and irrigation systems, which will improve agriculture and save water.

"We are delighted to have signed this cooperation agreement with the Plan International Foundation. There is a clear overlap between the goals of both foundations, and we therefore hope to be able to carry out projects in countries of interest for both Foundations," said Fernando Azaola, Chairman of the Elecnor Foundation, at the signing of the agreement.

In turn, the Chairman of the Plan International Spain Foundation, Luis Rivera, described the agreement as "a significant milestone, because Plan International advocates for the rights of children. And the reality is that in today's world there are no rights without water and electricity. And that's why it is essential that everywhere has access to safe supplies."

Plan International is an international organisation which promotes and advocates for children's rights in the field of development cooperation and humanitarian assistance. Free of religious, political or governmental affiliations, it was founded in Spain in 1937 by a British journalist to provide for children whose lives had been disrupted by the Spanish Civil War. It is currently active in 70 countries through development projects that directly benefit 81.5 million children.

PLAN INTERNATIONAL IS ACTIVE IN 70 COUNTRIES THROUGH DEVELOPMENT PROJECTS THAT DIRECTLY BENEFIT 81.5 MILLION CHILDREN

The Digital Business and Learning Project (PEAD), the first result of the agreement between the two foundations.

The aim of the Digital Business and Learning Project (PEAD) is to improve access to educational and telecommunications tools and to inclusive business models through digital kiosks in isolated rural communities in the Pacific and Atlantic regions of Nicaragua.

To get this project up and running, the Elecnor Foundation, along with Plan International Nicaragua and Télecom sans Frontière, applied to the Spanish Agency for International Development Cooperation's 2015 funding round for NGDOs. After assessing the application, the AECID awarded a subsidy equivalent to 40% of the total cost.

The project, which has 3,778 direct beneficiaries, is being implemented in communities in Francia Sirpi in northern Nicaragua. This is the country's most vulnerable region in social terms, with an extreme poverty rate of 71%. It is also an area with a very large indigenous population. In fact, Francia Sirpi is home to 70% of Nicaragua's entire population of indigenous and African descent. And within this segment, the Miskitu ethnic group is the largest, representing 91% of the communities included in the project.

The lack of electricity means there is a significant risk of pollution from the use of paraffin lamps, batteries and, in very remote spots, the use of diesel engines.

In indigenous communities there are cultural obstacles to the introduction of new technologies and access to energy, heightening their technological isolation.

The project entails the installation of six digital kiosks to improve access to basic telecommunications services, i.e. telephony and internet, fuelled by solar photovoltaic energy. Based on this infrastructure, the project envisages:

- The installation of IT packages for accessing information on education, healthcare and child protection with complete sensitivity to the culture of the Miskitu ethnic group.
- The promotion of reading among children, adolescents and young adults through the use of free educational software.
- The development of an inclusive business model with community leaders.
- The update of the Community Development Plan with the input of children, adolescents and young people.
- The preparation of a technical and financial report on the scalability of OCT service of the digital kiosks at national level.
- Systematisation of the process so that it can be replicated.

The Elecnor Foundation will be responsible for the following aspects:

- Preparation of instruction and training documents for local technical staff contracted on preventative maintenance, use and management of the photovoltaic system and ICT services.
- Preparation of the design and scaling document for the photovoltaic systems of the six digital kiosks planned.
- The preparation of a technical and financial report on the scalability of the ICT service of the digital kiosks at national level, which will be drawn up in conjunction with Plan Spain.

The second edition of the Elecnor Foundation Volunteer programme

In September 2015 the second edition of the Elecnor Foundation Volunteer programme got underway. Once again, the volunteers set off for the community of Totoral in Chile's Atacama desert, where the Foundation launched the Synergy water and energy project at the start of 2014

Through the Volunteer programme the Foundation extends its commitment beyond the implementation and funding of projects to incorporate the personal and technical contribution of several of its employees, who ensure that the projects are well maintained and that their potential is fully leveraged.

The second edition again involved the Synergy project, carried out in partnership with the Chilean Agriculture Ministry's Institute of Agricultural Development (INDAP) and the Chilean government and the ultimate aim of which is to improve the socio-economic situation and life quality of the 40 families in Totoral.

Volunteer elecnor

The volunteers who travelled to Chile on 31 August were selected via an internal process in which all Elecnor Group employees fitting a specific profile were invited to take part. The volunteers chosen by a panel with representatives of the various areas and activities of the organisation were María Carreira, an operations and production engineer at the Group's concessions company Celeo; Rubén López, Works Manager at Elecnor's Madrid Office, and Ana Jurado, a Shift Supervisor at the Astexol-2 solar thermal plant in Badajoz. They were accompanied by the team leaders Tomas Enfedaque Echevarría, now retired, who represented the Aragón Office of Ehisa, and Agustín Suárez Preciado, from Atersa. So there were five volunteers in total.

During their stay in Totoral they carried out a range of maintenance work and checked the equipment and systems installed. They also took advantage of the opportunity to instruct the local residents on effective use and maintenance of the facilities, which include:

- A 31 kW solar photovoltaic plant to power a water purification facility
- An electricity grid hooking up all homes, the church and the school
- A 55 kW solar photovoltaic plant to supply electricity for the irrigation pump supplying water from the community pond to the newly-created 1,000 m^3 reservoir
- A distribution network for irrigation water to each of the plot outlets at a regulated pressure of 4 kg/cm^2 covering 15 hectares
- 4 photovoltaic lighting installations in communal areas

Given the strong relationship forged between the village of Totoral and the Elecnor Foundation, the water purification unit installed in 2004 by Indap, which was out of use, was left in perfect working order.

THE SYNERGY PROJECT BENEFITS AROUND 40 FAMILIES IN THE CHILEAN COMMUNITY OF TOTORAL

THE FIVE VOLUNTEERS IN 2015 PERFORMED MAINTENANCE WORK AND CHECKED THE EQUIPMENT AND SYSTEMS INSTALLED

The Lights for Learning project illuminates more schools in Uruguay that lacked access to electricity

Since the end of 2014 every rural school in Uruguay has had electricity and an internet connection thanks to the Lights for Learning Uruguay project. The children at the 82 rural schools benefiting from the project now have better educational prospects and resources for their educational, economic, social and cultural development

"Lights for Learning Uruguay" is an initiative spearheaded by the Organisation of Ibero-American States (OEI), the Elecnor Foundation, UTE and the Uruguayan Ministry of Education and Culture through the CEIBAL Plan (Basic Educational Connectivity for Online Learning). The project has entailed investment of over EUR 1 million.

The Elecnor Foundation implemented the technical part of the project, installing photovoltaic systems to meet the internal and external lighting needs of the schools. These systems cover the internal and external lighting needs of the schools, powering technological and communications equipment such as TVs, computers and mobile phones. The goal is to improve educational conditions for thousands of children in the area, providing them with a key driver of quality education, electricity.

At the same time, the Foundation is also training the individuals appointed in each community on how to use and maintain this sustainable and environment-friendly energy system with a view to keeping it in good working condition and extending its useful life.

URUGUAY IS THE FIRST COUNTRY IN LATIN AMERICA WHERE ALL RURAL SCHOOLS HAVE LIGHTING AND INTERNET ACCESS

82 RURAL SCHOOLS AND OVER 500 PUPILS BENEFIT

Solar photovoltaic panels are transforming the fishing community of Laguna de Rocha

As UTE, Uruguay's state-owned power company, hooks the schools included in the project up to its grid, the photovoltaic systems installed in them are removed. By the end of 2015 the systems had been removed from 11 of the 82 schools that initially benefited from the Lights for Learning Uruguay project.

To make full use of the equipment and systems removed from these schools, an initiative has been launched to meet the energy needs of the fishermen of the Laguna de Rocha wetland. The main aim of this project is to guarantee the supply of power for the preservation of fish, which is essential for improving the conditions in which production is sold. The absence of refrigeration means that fishermen have to sell their catches immediately to intermediaries, with no other option than to accept the low prices offered.

The impact of this initiative is not solely economic because it will also improve the production and social capacities of the community and significantly enhance life quality through the introduction of a sustainable development model in an exceptionally environmentally sensitive area.

Laguna de Rocha is part of a coastal wetland system that also includes the José Ignacio, Garzón and Castillos lagoons. This wetland system forms part of the "Bañados del Este Biosphere Reserve", which has been included in UNESCO's "Man and the Biosphere Programme" (MAB) since 1976.

First Laboratory of Ideas on Renewable Energies

INDUSTRIALES
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In 2015 the Elecnor Foundation Chair in Energy Efficiency and Renewable Energies organised the First Laboratory of Ideas on Renewable Energies, which involved some of the leading lights in the sector

The specific theme of this first edition was "Renewable versus conventional generation. The search for a proper balance". This is a highly topical issue, with the debate on Spanish and European energy strategy over the coming years currently livelier than ever.

The event was supported by the financial daily El Economista, which published a comprehensive summary. Its Editor in Chief, Rubén Esteller, moderated the event, while Guillermo Planas, Managing Director of Enerfín, and Emilio Mínguez, Head of the Polytechnic University of Madrid (UPM)'s Higher Technical School of Industrial Engineering (ETSII), introduced the sessions. The speakers were Luis Atienza, Chairman of Argo Capital Partners; Juan Temboury, Managing Director of Fortia Energía; Carmen Becerril, Director of Acciona, and Tomás Gómez, Director of the Spanish National Energy Commission (CNE).

The topics discussed at the ETSII of UPM included society's emerging energy needs in both developed and emerging countries. Based on data, the speakers sought to pinpoint trends in the new energy model and in electricity generation, the economic and technical challenges for the full integration of renewable energies into the energy structure, and the regulatory factors that have slowed integration in various countries, including Spain.

Of crucial importance was the confirmation that Spain, which has spearheaded the worldwide rollout of renewables, is well placed to continue to do so in future despite the paralysing effect of the electricity sector reform's of 2013 and 2014. The experts all agreed that Spain can play an important role in the coming years in spheres such as the relaunch of wind energy through the upgrade and refurbishment of facilities whose obsolescence has rendered them inefficient.

Third edition of the "Specialist Course in Low and Medium-Voltage Electrical Installations" Salesianos Deusto College

The Elecnor Foundation held the third "Specialist Course in Low and Medium-Voltage Electrical Installations" at the Salesianos Deusto College (Bilbao)

Once again, this course provided an excellent opportunity for vocational training students of electricity distribution in the standard grade to complete their training, making them better prepared to work in the electricity sector in the future.

This is a modular, 60-hour course over three weeks and includes theory classes, hands-on classes and a visit to Elecnor's facilities. The training programme for the course, which takes place on the premises of the Colegio Salesianos Deusto, is designed by the Elecnor Foundation, which also financed the adaptation of the laboratory of the college's laboratory and provided the equipment required for the course.

This third edition of the course was staged in February and March. Once again, there were many applications from students, but most important was the positive feedback they provided, in particular after the practical sessions. The outstanding student was Gaizka Azcurreta Goneaga.

The Elecnor Foundation Renewable Energy and Energy Efficiency Chair furthers research

Having completed its 2013 and 2014 research, the Elecnor Foundation Renewable Energy and Energy Efficiency Chair has embarked on a new project. This initiative is aimed at both academics and students of the Polytechnic University of Madrid (UPM)'s Higher Technical School of Industrial Engineering (ETSII)

Projects are selected in two ways. In the first, Elecnor makes a specific proposal and researchers are then sought from the UPM's ETSII with an interest in the projects and the competences to carry it out; in the second, a call is issued with areas of interest for Elecnor and academics put forward projects that fit into these areas. The most interesting are then selected and the definitive scope agreed.

The projects are fully financed by the Chair.

In the 2013-2014 academic year two projects were started and completed:

- The development of a new calculation tool for optimal scaling of a diesel-photovoltaic hybrid power plant.
- The energy refurbishment of a building.

In 2015 a new project was greenlighted aimed at process optimisation in the construction of a solar photovoltaic farm. This includes the identification and analysis of all the existing processes in the construction of a solar photovoltaic farm, from the bidding phase to start-up and the subsequent maintenance of the facility (engineering, planning, logistics, construction…). Subsequently areas for improvement in each process will be sought, along with solutions for individual and collective optimisation.

The project is headed by Elecnor's Solar Photovoltaic Unit and is being carried out by two academics from the Department of Engineering Organisation, Business Administration and Applied Statistics of UPM along with a student from the current Masters Degree in Organisational Engineering programme.

Grants programme with the Higher Technical Industrial Engineering School (ETSI) of Valencia's Polytechnic University

UNIVERSITAT POLITÈCNICA DE VALÈNCIA

In 2015, the Elecnor Foundation continued fostering the grants and awards programme it has been sponsoring for twenty years with Valencia's Polytechnic University (UPV)

Thanks to this programme, four UPV students (María Lorduy Alos, Jesús Bermúdez Campos, Rosalía Gomis Cebolla and Carlos Espilez Bertolín) each received a grant of EUR 1,800. The Elecnor Foundation also awarded a prize of EUR 1,500 for the best dissertation, which was entitled "Design of electromagnetic devices through the use of advanced numerical simulation and optimisation (PGD) techniques" and written by Gustavo Chaqués Herraiz.

INDUSTRIALES
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Students at the Polytechnic University of Madrid (UPM)'s Higher Industrial Engineering Faculty visited two of Elecnor solar thermal plants and the company's Atersa factory in Valencia

In spring 2015, within the framework of activities organised by the Elecnor Foundation Renewable Energy and Energy Efficiency Chair, first year industrial engineering masters students from the Polytechnic University of Madrid (UPM)'s Higher Technical School of Industrial Engineering visited Elecnor's solar thermal plants in Ciudad Real. This excursion was followed by a visit to the factory of Elecnor's solar photovoltaic subsidiary Atersa in Almussafes (Valencia)

The visit was part of the subject entitled Ingenia "Engineering an electrical system." This is a new subject model based on competences, in which the students, distributed in groups, build and develop a product. In this case, the product is a microgrid supplied with renewable energy, with two different businesses, generation and distribution (purchase of electric power), competing against each other in an electricity market.

Their day was rounded off with a class taught by Celso Peña, of the Engineering Unit, who explained in detail how a parabolic trough solar thermal plant is built and works. Afterwards, they discussed plant safety, with particular reference to risk prevention. Lastly, the students visited the two plants with Elecnor staff, who provided in-depth information on a tour of the facilities.

These two plants and Elecnor's facility in Badajoz have a combined installed capacity of 150 MW.

During their December visit to the Atersa factory in Almussafes (Valencia), the only one still operational in Spain in the solar photovoltaic sector, students had the opportunity to find out first hand about the various stages of the production process in the solar photovoltaic industry, from the outset through to quality control. The objective was to show how engineering theory is put into practice in a commercial setting.

Enrique Daroqui, Technical Director at Atersa, discussed the realities of the domestic and international solar market with students. They were then given a tour of the plant during which they were able to learn a great deal about and get hands-on experience of the solar panel manufacturing process.

The Atersa plant in Almussafes started operating in 2008 after more than 20 years of manufacturing activity in other locations in the same province. It currently has around 20,000 m² of production facilities where over 100 qualified staff work in three shifts.

2008-2015: other projects during the last seven years of working to make the world a better place

In addition to the projects and undertakings of the Elecnor Foundation in 2015, we provide a summary below of those implemented since the Foundation was set up in 2008. Maintenance work is still being performed for most of these projects and some have seen their initial scope widened

Social infrastructure projects

Illuminate, Honduras

In Honduras, the Illuminate project has brought solar photovoltaic power to several communities in the municipality of Cantarranas in the Department of Francisco Morazán. This involved setting up 124 photovoltaic systems in three schools, homes and for the fire station, the ambulance service and other community facilities. As a result, over 13,000 people now have a better quality of life, enhanced opportunities for economic development and better education options. The three schools in the area also now have a library and a play centre thanks to the materials donated by Elecnor employees.

Loma Atravesada, the Dominican Republic

Loma Atravesada is the Elecnor Foundation's first social infrastructure project in the Dominican Republic, where Elecnor has been present for three decades. The project has brought power to 1,400 residents of Loma Atravesada, in the Municipal District of Las Galeras, which lacked any form of energy infrastructure prior to the project. The project entailed the construction of a seven-kilometre transmission line and the installation of voltage transformers, bringing light to 178 households and the church, which is this community's principal social amenity.

The "Solar Back-up Systems", Ghana

The Solar Back-Up Systems initiative guaranteed a secure power supply for six hospitals and three clinics run by the Sisters Hospitallers of the Sacred Heart of Jesus, the St. Anne Sisters of Charity and the Ghanaian Ministry of Health. All the centres have been equipped with back-up energy storage systems, which ensure a continuous, good quality supply in an environment where the national power grid is unreliable. As a result, the centres are better able to provide healthcare services, in particular in critical areas such as surgery, accident and emergency and maternity provision. The centres deal with an average of 500,000 patients and carry out over 7,000 operations annually.

Ronald McDonald House, Madrid, Spain

The Elecnor Foundation is involved in its first social infrastructure project in Spain alongside the Ronald McDonald House Charities. Under this initiative, families of children receiving in-patient treatment are offered accommodation close to the health centre where they are being treated. Elecnor built the Madrid Ronald McDonald House, at 3,000 m^2 the largest in the country, on a turnkey basis in the grounds of the Niño Jesús Children's Hospital. For its part, the Elecnor Foundation -which has a member on the House's board- was responsible for the energy efficiency project, which will deliver total energy savings of 46.5% compared with conventional installations as well as cutting CO_2 emissions by 52.45 tonnes.

Training and research projects

Sustainability, CSR and social innovation

Deusto Business School
Universidad de Deusto
University of Deusto

The Elecnor Foundation and Deusto Business School have agreed to jointly establish and develop forums and training initiatives in the field of sustainability, CSR and social innovation. The agreement came into force in 2014 at the first Deusto Business School-Elecnor Foundation Dialogue Forum, a gathering of international experts to discuss corporate social responsibility, value creation and the international expansion of businesses.

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