STATES & REGIONS

HOW THE BASQUE COUNTRY BECAME A SMART GRIDS LEADER THROUGH A PUBLIC-PRIVATE PARTNERSHIP

CASE STUDY | BIDELEK SAREAK: THE BASQUE COUNTRY'S SMART GRID PROJECT

This case study shows how the Basque Country created an economic and environmental opportunity from a legislative obligation by rolling out smart meters and modernizing its grid. It is part of the Energy Transition Platform - a global initiative supporting highly industrialized, carbon-intensive state and regional governments in developing and implementing innovative clean energy policies to accelerate the low carbon transition.

The partner regions of the Energy Transition Platform – Alberta, the Basque Country, California, Hauts-de-France, Lombardy, Minnesota, North Rhine-Westphalia, Silesia, South Australia, Upper Austria and Wales – come together to learn from their global peers, to build strong partnerships and to jointly overcome barriers to the adoption of clean energy models. The Energy Transition Platform is part of the States & Regions Policy Innovation program and was launched by The Climate Group, alongside the initiative's lead government, North Rhine-Westphalia, and Stiftung Mercator, in early 2016

Bilbao, Basque Country

"WE MUST NOT FORGET THAT THE ENERGY TRANSITION IS NOT A GOVERNMENTAL ISSUE, IT IS A SOCIAL ISSUE. WE BELIEVE THAT GIVING PEOPLE TRANSPARENT ACCESS TO THEIR ENERGY CONSUMPTION WILL BE A KEY DRIVER OF THIS TRANSITION."

- Aitor Oregi, Director of Energy, Mines and Industrial Administration, Government of the Basque Country

DESIGNING THE GRID OF THE FUTURE

Smart grids incorporate information and communications technology into electricity generation, transport and consumption, with the aim of minimizing environmental impacts, improving reliability and quality of electricity supply, and reducing costs for suppliers and consumers. They deliver high-quality, real-time data on energy supply and consumption and enable a near instantaneous and remote management of the electricity load and grid incidents.

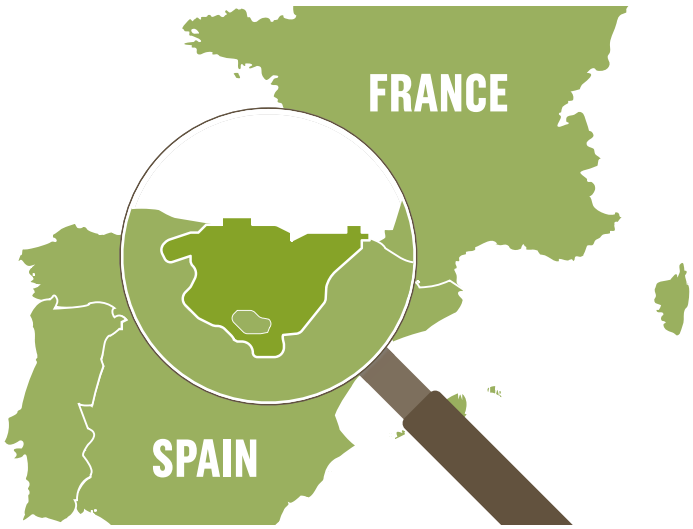
The modernization of traditional grids is a key step in the energy transition, as smart grids can integrate higher shares of renewable energy, decentralized and small-sized electricity generation systems, as well as energy storage.

They also make economic sense, with considerable evidence that the benefits of smart grid technologies outweigh the costs. A 2012 study which analyzed 30 smart meter projects in 12 countries found that the net present value of their benefits exceeded that of their costs by nearly two to one[1].

Taking these environmental and economic benefits into account, a few national and regional governments are leading the way to the grid of the future – including the Basque Country in Spain.

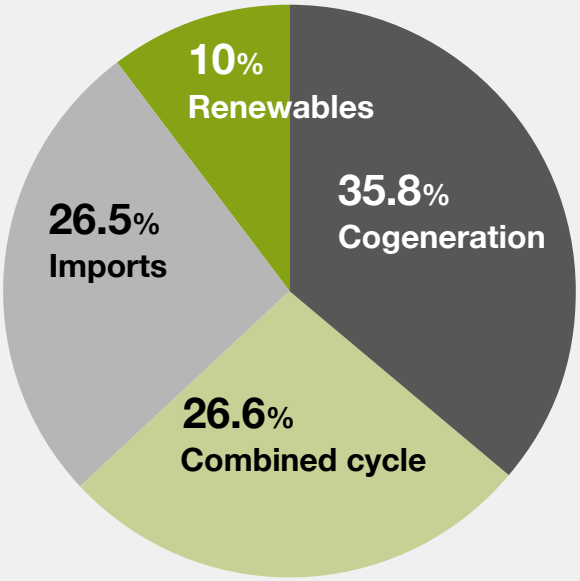
In 2011, this government initiated a public-private partnership to modernize its electricity grid in the urban areas of Bilbao and Portugalete and the rural district of Lea-Artibai. Six years later, the project has reached a successful conclusion, resulting in the installation of over 400,000 smart meters and the development of an innovative regional industry.

SPOTLIGHT ON THE BASQUE COUNTRY



GOVERNOR	IÑIGO URKULLU (BASQUE NATIONALIST PARTY, EAJ-PNV)
PARLIAMENT COMPOSITION	EAJ-PNV MAJORITY
GDP	US$75.3 BILLION (2014)
POPULATION	2,173,210 (2014)

ELECTRICITY MIX (2016)[2]



1 King, C. (2012), "Building a Business Case for Smart Meters", https://gigaom.com/2012/03/06/building-a-business-case-for-smart-meters/

2 Source: REE (Red Eléctrica de España)

THE BIDELEK SAREAK SMART GRID PROJECT: THROUGH ITS ENERGY AGENCY, THE BASQUE COUNTRY HAS ESTABLISHED A FIVE-YEAR PUBLIC-PRIVATE PARTNERSHIP WITH IBERDROLA DISTRIBUCIÓN TO MODERNIZE ITS ELECTRICITY GRID, DELIVERING HIGH QUALITY SERVICE TO CONSUMERS AND BOLSTERING ITS LOCAL INDUSTRY.

SCOPE OF THE PROJECT

The goal of the project was to modernize the grid through a variety of equipment:

- **Smart meters** allowing remote management and automatically transmitting real-time data to electricity suppliers;
- **Modernized transformation centers** with remote management and automation equipment to provide information on the grid and allow for a better anticipation of incidents; and,
- **Smart substations** for a better knowledge and control of rural grids.

The project was also aimed at educating consumers with:

- User friendly tools, including a **web portal** for consumers to analyze their electricity consumption and reduce their utility bills;
- **A showroom** in the Biscay Science and Technology Park, with real operating equipment provided by the manufacturing companies and technology suppliers of the project.

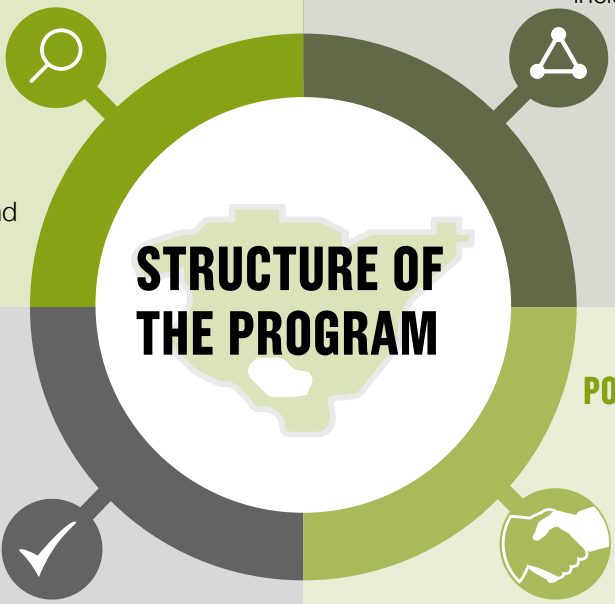
LEGISLATIVE FRAMEWORK

The Bidelek Sareak project stemmed from two pieces of legislation:

– The Directive 2009/72/EC of the European Parliament states that by 2020, at least 80% of consumers must be equipped with intelligent metering systems

– Spanish law states that all energy consumption meters under 15 kilowatts will need to provide hourly data and be equipped with remote management technology by December 31, 2018.

However, the Bidelek Sareak project went well beyond the targets outlined in these legislations: it aimed not only to install smart meters – ahead of the deadline – but to modernize the entire grid, including substations and transformation centers.



STRUCTURE OF THE PROGRAM

BENEFITS

- A **modernized grid**, leading to an improvement in the quality and reliability of supply, with a minimization of network losses and better responses to incidents;
- **Decrease in electricity costs** for consumers and in **operating costs** for electricity suppliers;
- **Better integration of renewable energy**, small-sized and decentralized generation, energy storage and electric vehicles; and,
- **Support for the local industry** and the general competitiveness of the region. The project stimulated innovation and created jobs in electrical/communication equipment manufacturing, assembly, installation and maintenance. 96% of the project's contracts were awarded to Basque suppliers.

POLICY TIP

To develop an innovative project while ensuring local economic benefits, identify your industry's strengths and foster their development projects with public support and funding.

STAKEHOLDERS

- The Basque Government, through the **Basque Energy Agency (EVE)**, provided financial support, vision and expertise on energy savings, energy efficiency and demand management;
- **Iberdrola Distribución Eléctrica**, an electricity supplier active in most parts of Spain and headquartered in Bilbao, participated financially and led on the technological aspects of the project;
- In addition to the two main partners, **13 companies** were involved as solution providers; and,
- **Consumers** were included through two web portals designed to help them monitor their energy consumption and improve their energy efficiency.

CLIMATE ACTION TARGETS

BY 2030

GHG emissions reduction (2005 levels)

Renewables in total final energy consumption

BY 2050

GHG emissions reduction (2005 levels)

Renewables in total final energy consumption

Supported by the Climate Change Strategy of the Basque Country to 2050, which sets nine goals and 70 actions covering a wide range of topics including sustainable transport, resilience, waste management and innovation.

BIDELEK SAREAK: THE BASQUE COUNTRY'S SMART GRID PROJECT

WHAT IS THE PROJECT AIMING TO SOLVE?

The Bidelek Sareak project was aimed at solving a variety of issues for suppliers, consumers, and the wider Basque society:

- Helping electricity suppliers **comply with European and national regulations**;
- Ensuring a **high-quality service to consumers**, through reliable supply, flexible contracts and improved customer service;
- Transforming the grid to ensure its **capacity to integrate low carbon, small-scale and decentralized electricity generation**; and,
- **Supporting the local industry and regional competitiveness** by making the Basque Country a leader in the field of smart grids.

HOW IS IT INNOVATIVE?

The project is innovative on several levels. First, because of its **scale**: it targeted all levels of the grid (from generation to consumption, across all voltages), in urban and rural areas, and went well beyond national and European legislation to create an economic, technological and social opportunity.

Second, because of the **partnership model**, bringing together the public and private sectors, through EVE and Iberdrola Distribución, for a long-term collaboration.

And finally, the project fostered **technological innovation**, including system automation, power line communication and optic fiber solutions, and low voltage management technologies.

HOW LONG DID IT TAKE TO IMPLEMENT?

The project was implemented **over a five-year period, between 2011 and 2016**.

In 2010, the Basque Country's Strategic Plan of Science, Technology and Innovation (PTCI) identified smart grids as a strategic development area in the energy sector. At the same time, Iberdrola Distribución had started the deployment of a smart grid pilot in the city of Castellón, using the first generation of smart meters. Together with several other companies, Iberdrola sought support from the Basque Energy Agency to develop the equipment necessary for the roll out of a new generation of smart grids. The Basque government saw this cooperation as an opportunity to boost the region's competitiveness and improve its electricity network.

The Bidelek Sareak project was the result of this favorable political and technological context. It officially started on September 30, 2011 with the creation of Bidelek Sareak AIE, a corporation bringing together the Basque Energy Agency and Iberdrola Distribución.

HOW IS THE PROJECT FINANCED?

The Bidelek project is a public-private partnership between the Basque Energy Agency and Iberdrola Distribución. **The partners invested a total of 60 million Euro over a five-year period, with Iberdrola contributing 54% of the investments and the Basque Energy Agency 46%**. The Energy Agency's investments were recovered by the time the project was concluded.

"AT THE BASQUE ENERGY AGENCY, WE ARE COMMITTED TO SMART GRIDS FOR TWO REASONS: FIRST, FOR THE BENEFIT TO THE BASQUE INDUSTRIAL AND TECHNICAL SECTORS, AND SECOND, TO PROMOTE THE RATIONAL USE OF ENERGY BY CONSUMERS."

- Txaber Lezamiz, Director of the Bidelek Sareak project, Basque Energy Agency

WHAT WERE THE MAJOR CHALLENGES AND HOW WERE THEY OVERCOME?

Apart from the standard technical issues often linked to innovative projects, Bidelek Sareak did not encounter any major setback. Nonetheless, its social component was identified as needing improvement: **better communication on the advantages of smart grids is essential to ensure public buy-in and to avoid mistrust from electricity users**.

RESULTS TO DATE

The project was concluded in 2016 with outstanding results:

– Installation of **407,179 smart meters** in the provinces of Bizkaia and Gipuzkoa;

– Modernization of **2,036 transformation centers**; and,

– Modernization of **two high-voltage substations** and construction of a third one.

Before the start of Bidelek Sareak, only 3% of the transformation centers in Iberdrola Distribución's network were automated - **this has now risen to 35%, with urban areas such as Bilbao and Portugalete reaching 55%**.

In addition, **Iberdrola has purchased 340 million Euro worth of equipment from Basque companies** as a result of the project. This has boosted Basque industry, driving an increase in R&D activities and creating high-qualification jobs.

WHAT ARE THE KEY REQUIREMENTS TO REPLICATE THE PROJECT MODEL?

The success of the Bidelek Sareak project can be explained by two main factors:

– **The innovative public-private partnership model between EVE and Iberdrola**, which made a project of this scale possible; and,

– **The favorable situation of the equipment goods industry in the Basque Country**, which allowed a rapid response to the technological needs for the implementation of the project.

The Bidelek Sareak model is replicable outside the region and the country, as was demonstrated by the sustained international interest in the project. Its results were presented to the main power companies of Ecuador, Colombia, Mexico and Brazil.

When implementing a public-private partnership like Bidelek Sareak, public buy-in must be secured early on. Technology alone cannot compensate for a lack of awareness and education on the advantages of smart grids and smart meters.

LESSON LEARNED

CONNECT WITH THE BASQUE COUNTRY

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Website of the Bidelek Sareak project: bidelek.com

CONNECT WITH US IF YOU WANT TO KNOW MORE ABOUT OUR ENERGY TRANSITION PLATFORM

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