

4.3 Intellectual Capital

Management approach	Principal activities 2019
<p>Promotion of R&D</p> <ul style="list-style-type: none"> Iberdrola continues to wager on innovation as one of its main pillars for successfully facing the future energy scenario, promoting energy efficiency, decarbonisation and the electrification of the economy. Ignacio Galán, the chairman & CEO of the Iberdrola group, has received the National Innovation and Design Award in the Innovative Career Category from the Ministry of Science, Innovation and Universities. 	<ul style="list-style-type: none"> €280 million of R&D investment in 2019, a 5% increase over 2018. Expansion of Iberdrola's Universities Programme, <i>Iberdrola U</i>, with the inclusion of Yale University in the United States, Pernambuco University in Brazil and Hamad bin Khalifa University in Qatar. Wager on internal talent through the launch of <i>INVENTA</i>, the global platform for the management of innovative campaigns and ideas. Launch of two <i>start-up challenges</i>, where companies throughout the world submit potential solutions to specific problems of the energy industry. Expansion of the Innovation Programme with <i>Proveedores Iberdrola Bizkaia</i> (Iberdrola Biscay Suppliers), to finance innovative projects of Biscayan suppliers allowing for the development of products and services in the energy industry.
<p>Efficiency and new products and services</p> <ul style="list-style-type: none"> New developments driving flexibility, operational efficiency and the safety of facilities, as well as a reduction in our environmental impact through the implementation of disruptive technologies and the reduction of emissions. Design of new products that guarantee an efficient, agile and high-quality service and ensure an improvement in the experience of its more than 16 million customers. 	<ul style="list-style-type: none"> Development of domestic and international R&D projects to promote sustainable development, renewable energy and emerging technologies. There has been a launch of the <i>Asistente Smart Iberdrola</i> allowing customers to disaggregate the electricity consumption of their home appliances. Customers with electric vehicles can manage their home recharging point using the <i>Smart Mobility Hogar</i> app. It will also be possible to locate and reserve recharging points on the web using the <i>Iberdrola Public Charge App</i>. Using the <i>Smart Solar App</i>, each customer will be able to monitor generation, self-consumption and injection into the grid from their solar panels.
<p>Disruptive technology and business models</p> <p>Through the <i>Iberdrola-PERSEO</i> international start-up programme, investments are made in technologies and new disruptive businesses models, which ensure the sustainability of the energy model. Since its creation, more than €65 million have been invested through the programme worldwide.</p> <p>Lines of activity:</p> <ul style="list-style-type: none"> Technologies favouring the integration of renewable energies. Aggregation and management of distributed energy resources (batteries, solar, etc.). Innovative solutions for customers (demand-side management, digital solutions, etc.). Advanced technologies for operation and maintenance of energy assets. Electromobility: charging infrastructures and new solutions. Energy efficiency, including efficient thermal solutions. 	<ul style="list-style-type: none"> Iberdrola has been recognised by the European Commission within the framework of the <i>Start-up Europe Partnership</i> initiative, which has named Iberdrola for the third consecutive year as one of the top 12 European companies that work best with start-ups, and also giving it the special "<i>Start-up Procurement Award</i>". There were more than 15 pilot projects with start-ups in technological areas like Artificial Intelligence, Big Data, Internet of things (IOT) and blockchain in 2019. Investment in the company Wallbox, dedicated to the development of electric mobility solutions, and in Balantia, which develops solutions for improvement in the area of energy efficiency. These investments are an important contribution to Iberdrola's wager on the areas of electric mobility and energy efficiency.

📄 Innovation Report

Highlight the value of the company's intangible assets

Main R&D research projects

- Smart grids**
- *ATELIER* arises with the goal of developing Positive Energy Districts in eight European cities where Smart solutions for cities will be implemented and tested.
 - In *COORDINET*, transporters, distributors and consumers of electricity will define a European energy platform allowing for a bidirectional flow of energy.
 - As regards the integration of electric vehicles into the grid, the *ASSURED* project intends to develop rapid recharging solutions for heavy-load electric vehicles.

- Renewable energy**
- There has been a launch of the European *ENERXICO* project, the goal of which is to prepare computational fluid dynamics (CFD) models for future exascale computers and advance in the use of simulation models.
 - There has been a continuation of the *ROMEO* and *ASPA* projects to develop new models and tools for the early detection of failures based on AI/big data techniques.
 - In offshore wind, the construction of *East Anglia One* offshore wind farm in the United Kingdom is nearing completion and will enter into operation in 2020.

- Clean generation**
- The *OCTAVE* project, giving greater flexibility to combined cycle plants and facilitating the integration of renewables into the energy mix, has been completed.
 - *REDEMIS* has commenced, to improve environmental performance in combined cycle startup, shut-down and load changing.

- Customers**
- *Energy Wallet* allows the purchase of 6-, 12- or 24-month green energy packages knowing the final price. from the renewable plant selected by the customer. It can be used at different addresses and managed from a mobile phone.
 - *Smart Home* includes a wide range of web-connected devices, waging on energy management, and the *Asistente Smart Iberdrola* allows for the disaggregation of consumption.
 - *Smart Mobility* is a comprehensive solution that includes the purchase of a charging point, installation and warranty, operation by means of an app, and a personalised supply contract.

Iberdrola, at the forefront of digital transformation

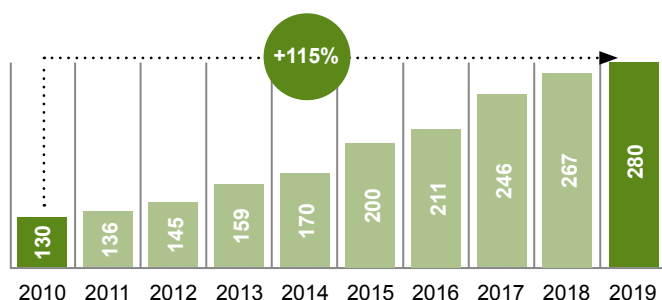
Iberdrola's roadmap has digitisation as one of the keys of the future energy scenario.

Iberdrola participate in proofs of concept and multi-sector working groups, in addition to its R&D projects.

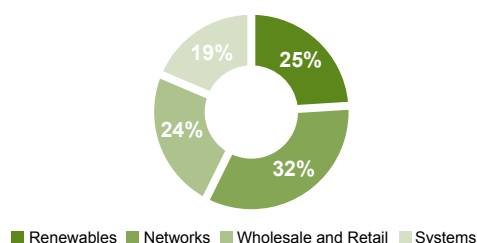
It leads working groups of the *World Economic Forum (WEF)*, including *Cyber Resilience*, and participates in others, including *Digitization* and *Blockchain for Energy* We are also members of *Euroelectric Blockchain Platform*, the *ERT Digital Transformation Working Group*, the multi-sector consortium of *Alastria* and the *Digitisation Committee of the Spanish Chamber of Commerce*.



Investments in R&D (€M): 2nd most innovative company in Europe, and 3rd in the world¹



% R&D investment by strategic area



(1) Industry classification by the EU R&D Scoreboard, with a total of 23 companies.