

Iberdrola's Startup Challenge to Enhance the Resilience of the Electrical Infrastructure

1. Background:

Iberdrola is positioned as one of the world's leading energy companies, with a workforce of more than 41,000 employees and collaborating with more than 22,000 supplier companies. The company is engaged in the generation, distribution and marketing of electricity.

Iberdrola has more than 400,000 substations and transformer stations in the United States, Brazil, the United Kingdom and Spain, and more than 260,000 km of power lines in Spain alone.

Electricity grids have become the backbone of modern life, impacting practically all aspects. The supply of electricity is increasingly essential, as it is involved not only in guaranteeing the quality of daily life, but also in the new activities resulting from the electrification of the economy (transport, industry, etc.).

This is where the concept of resilience of electricity grids becomes a protagonist due to multiple potential risks (extreme weather events, natural disasters...)

Resilience is therefore essential to ensure a stable and reliable grid supply, with a focus on minimising the impact of risks and enabling rapid recovery, while protecting against disruptions and facilitating adaptation to future changes and challenges.

In order to keep network assets in optimal operating conditions and guarantee their correct operation in most possible scenarios, it is essential to have detailed information on the assets, potential adverse phenomena/risks, carry out periodic maintenance of the electrical infrastructure and efficiently manage the resolution of incidents caused by external factors. I

Iberdrola has carried out tests to integrate technologies in the field of grid resilience, for example: calculation of vegetation status through the use of satellites, heat map of the probability of failures at the province level in the face of adverse weather events, etc. using advanced computing techniques, AI, satellite images... For this reason, priority will be given to those solutions that are effective and can be integrated into the usual operations, ensuring adequate levels of industrial maturity and with direct applicability in the context of the challenge that arises.

2. Description of the Challenge:

Through [our PERSEO start-up program](#), we launched a challenge in search of solutions focused on increasing the resilience of electrical infrastructure.

Use of advanced computing techniques to improve the resilience of the distribution network, anticipating extreme weather events and minimising their impact on customers.

In order to respond to the challenge, the management of adverse events has been divided into two moments:

- **Pre-incident computing**
 - Simulation of the impact on inclement weather (mainly floods and cyclogenesis/tornadoes/snowfall).
 - Calculation of impact and resilience measures quantitatively of network assets against specific effects in the short/medium/long term
 - Optimizing network design to increase resilience by taking into account extreme weather probability and effector damage.
- **Post-incident computing in emergency situations**
 - Calculation of prioritisation of incident resolution by impact criteria (essential supplies, life support, etc.).
 - Calculation of the location of generator sets/batteries.
 - Management of learned journeys: Real-time management of barriers/problems encountered (road closure, fallen bridges, flooded area, impassable road...) is required by users of mobile applications in adverse weather situations. These "notices" must serve to inform the user of all the problems identified related to the installations and that affect navigation to the destination installation.

The proposed solution must meet the following objectives:

- **Integrable:** solutions are sought that allow adaptation/integration with Iberdrola's existing systems, assessing the type of technological solution provided (SaaS, PaaS, on-premise, API, SDK, etc.).
- **Scalable:** priority will be given to proposals that allow controlled scaling in phases with the aim of growing in the number of assets to be managed or the geographical area to be monitored.
- **Effective:** it will be necessary to detail the time necessary to obtain results on request and with an adverse climatic event in the short term.
- **Efficient:** the proposed solution must detail the distribution of associated costs, dividing between fixed costs and variable costs.
- **Work optimisation:** The aim is to improve the resolution of incidents in the face of adverse events, taking into account the available resources (people and materials).
- **Increased awareness and training:** Increasing awareness and training of workers on resilience issues is critical.
- **Implementation of innovative technologies:** The adoption of innovative technologies is key to improving resilience. These technologies must be able to serve as a model for other companies in the sector, demonstrating their effectiveness and efficiency.

3. The Prize

The prize will consist of the signing of a collaboration and testing agreement with PERSEO or any other company of the group, which will assume the costs of these activities and **provide the winner with the necessary technical support**, as well as an **environment and real data to test the solution** (network topology, physical location and characteristics of the assets...), giving you access to equipment, infrastructure, high-tech sites and co-working areas. **The selected project will be developed in collaboration with technical specialists from Iberdrola's Networks area.**

In addition, they will be included directly in the process of joining the **Global Smart Grids Innovation Hub**, as another collaborator who will be able to benefit from the services, activities and resources that are made available in the GSIG Hub.

If the trial or proof of concept is successful, **Iberdrola could offer the participant the opportunity to scale up the solution**, adopting it through commercial agreements. In addition, PERSEO could consider investing in the participating company and/or the winning solution of the challenge.