



GENERATE

How can we build and/or convert our linear infrastructures into renewable and green energy generators to self-supply their energy needs and make surplus energy available to the market?



Challenge origin

The Sacyr Infrastructures business line aims to enhance the value of linear infrastructures and turn them into sources of clean energy generation.

Objectives

To identify technological solutions to take advantage of infrastructures and their use in order to capture and store energy from renewable and clean sources, then distribute it sustainably to meet the needs of current and future infrastructure-related services, as well as to make surplus energy available to the market through energy distribution networks.

Aspects to Consider

Linear infrastructures are defined as roads and/or railroad lines with large extensions that can be several hundred kilometers long.

The aim is to look for innovative solutions that make building new energy-generating infrastructures possible—including the implementation of the solution from the design phase of the project—and also to convert existing ones into clean energy sources.

Solutions for capturing, storing, and distributing energy must not compromise the integrity of the infrastructure and must not conflict with industry specifications and construction regulations.

Problems to Solve

- Linear infrastructures represent passive energy-consuming surfaces (lighting, maintenance, services, signage, etc.).
- The demand for clean energy is increasingly strong, both for the industrial market and for domestic consumption.
- Ever-increasing sales of electric vehicles translates into energy needs from users and directly impacts road design, construction, and concessions.

Benefits

- Converting existing infrastructures into assets through the production of green energy.
- Fighting climate change through the design of new self-sufficient infrastructures which are capable of generating more energy than they consume.
- Injecting more GWh from renewable/clean sources into distribution grids.
- Producing and distributing green hydrogen.



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We Look for...

- **Energy harvesting solutions:**
 - Sensors and transducers for renewable energy harvesting: Asphalt solar collectors, photovoltaics, etc.
 - Advanced materials with energy harvesting capacity:
 - Phase-changing materials.
 - Nanomaterials.
 - Piezoelectric ceramics.
- **Energy conversion and production solutions:**
 - Clean energy generators: Electromagnetic, piezoelectric, thermoelectric, induction, kinetic, etc.
 - Innovative solutions for the production and distribution of green hydrogen (i.e., clean hydrogen plants).
- **Energy storage systems.**
- **Solutions that allow for the redistribution of the energy produced.**