

CHALLENGE 2

Grupo Energía Bogotá and Redeia seek “solutions to protect bird life in the proximity of power lines”

An initiative to promote innovation and sustainability

Introduction

Grupo Energía Bogotá (GEB) is a leading company in the energy sector in Latin America that operates in the electricity and gas generation, transmission, and distribution. Its commitment to sustainability and innovation has been key to developing projects promoting energy efficiency and reducing emissions. It manages assets worth more than US\$20 billion and is present in more than six countries.

On the other hand, Redeia is a Spanish company with a presence in LATAM dedicated to managing and operating key infrastructures, mainly power networks. With its strong orientation to sustainability, Redeia works on the integration of renewable energies and improvement of the security and efficiency of power supply. It manages more than 44,000 kilometres of power transmission circuits in Spain and coordinates the operation of the power system in that country. Additionally, it manages power assets in Chile, Peru and Brazil too.

Power lines, key for power transmission, may have a significant impact on bird life. Migratory birds are particularly vulnerable to collisions with power line infrastructures, especially smaller diameter cables that hinder their visibility. Thus, these collisions can have a detrimental impact on bird survival and overall biodiversity.

Aware of this problem, Redeia and Energía Bogotá Group have joined forces to seek "Solutions to protect bird life in the proximity of Power Lines". Both companies, leaders in the energy sector and committed to sustainability, have launched an initiative promoting innovation and the implementation of effective measures to mitigate the impact their operations have on birds.

Through this initiative, Redeia and GEB look for compiling information and proposals on new solutions to prevent birds from colliding with power lines that are reliable, effective, quick to roll out and efficient from an economic point of view.

Characteristics of power lines

Construction characteristics of high voltage power lines and their impact on bird life

High voltage power lines consist mainly of conductors, insulators and support structures that enable the efficient transmission of power to long distances. A critical element of these structures is ground wires, which are also known as power line cables, which are installed at the top of power towers. Their main function is to protect transmission lines from atmospheric discharges, acting as lightning arresters, and deviating rays to the ground.

From a construction perspective, ground cables have a lower diameter compared to key conductors, which hinders their visibility for birds. These characteristics, with their elevated location, make them a significant risk of collision for birds, particularly during their migrations or under low visibility conditions, such as cloudiness or dusk.

The impact ground cables have on bird life does not only put birds themselves at risk, but also could cause interruptions in the supply of power due to the collisions. These collisions could lead, in very extreme cases, to short circuits or damages to the power infrastructure, resulting in the need for costly repairs and potential power cuts.

Goals of the challenge

The goal is to compile information and eventually test on a representative and/or actual environment measures that protect birds, minimise the risk of collision and ensure a harmonious balance between power infrastructures and the natural environment.

The solutions proposed should allow for the detection of the power line cable in order to deviate the birds' flight. Their aim is to prevent and mitigate the risk of collision, especially in areas of high cloudiness or reduced visibility for any other reason.

Today, the most used and assessed solutions such as bird protections are based on using reflective, ultraviolet or sound elements.

In Spain, there is regulation governing the size and frequency (distance between bird protectors) that can be used for this challenge, in particular RD 1432/2008.

A technical guide has been prepared describing the types of approved bird protectors and the technical requirements for using each of them.

Restrictions and special conditions:

Devices must give an answer to electro-mechanical guidelines and technical conditions transmission lines should follow (such as weight of the device, installation and operation):

- Installation frequency
- Atmospheric and climate conditions under which bird protections would be implemented
- Not affecting other species

1 Power lines with good visibility

Solutions to be used under high visibility conditions are sought. Given the fact that birds in these areas have less difficulty detecting obstacles, solutions must focus on further improving this visual capacity. Reflective and ultraviolet devices, for example, could be optimised to ensure power line cables are easily visible from a large distance, reducing the risk of collision to a minimum.

2 Power lines with low visibility

For power lines in low visibility areas, such as areas with high cloudiness, dense fog or poor light at dusk, solutions that improve the detection of power line cables to prevent bird collision will be required. These solutions may include the use of sound elements that release audio signals to alert birds of the presence of obstacle, as well as light devices that increase the visibility of cables under conditions of poor light. The implementation of these methods must be effective and not intrusive, ensuring birds are deviated safely, not altering in a significant manner natural environments.