Company: Enel Green Power
Project name: Wind Energy & Biodiversity Protection
Project location: Spain, Italy
Please provide a short project description (5 lines) with link to any webpages which provide more detail:

Wind turbines can impact local ecosystems and biodiversity and for this reason, it is needed to find solutions able to detect and prevent the potential fatality issues of birds and bats in the wind plants. The Wind Energy & Biodiversity Protection test program, launched in 2022, is focused on extensive demonstrative testing of tools and sensors to make turbines safer for flying wildlife and make wind parks more sustainable. These systems, based on radar, camera, and microphone technologies, will detect and monitor, automatically and in real-time, birds and bats, with the possibility to act with different strategies to avoid fatal events in wind blades.
Five testing sites are involved in Europe (Spain and Italy), with different technologies, layouts and involved species. This massive experimental campaign follows the first launched in 2021, at Gibson Bay, a wind farm located in South Africa, for bat protection through the ultrasound barriers' technology.
What are the technologies involved in this project (hydro, wind, grids, hybrid projects [e.g., agrisolar])?

The technology involved is wind.

1. How did you take into account the relevant biodiversity and environmental protection legislation in this project? During which phase of the project were these considerations analysed and integrated into the project? Did you anticipate concerns around biodiversity and environmental protection for this project, and if so, what did that process look like and during which phase of the project did this occur?

   Wind turbines can impact negatively on local ecosystems and biodiversity because they can cause collisions with birds and create low-pressure areas, that affect the bats. To protect biodiversity, we can act by adopting mitigation measures such as dissuasion systems or turbine curtailment. The target of this project is to test and evaluate the efficiency of different innovative tools and sensors to protect these species, acting in fatal effects minimization. The different tools have the scope to detect and prevent the mortality of birds and bats in wind farms to make green and renewable energy even more sustainable.

2. What makes this project innovative?

   Field test and benchmark of innovative tools, sensors, and technologies to monitor and detect automatically and in real-time wild birds and bats, with the possibility to act with different strategies to avoid fatal events in Wind Turbines.

   Characteristics of the tested systems:
   - Automatic systems based on radar, camera, and microphone technologies to detect birds and/or bats, estimating their distribution, numbers, behaviours, and deterrent effectiveness.
   - Easy implementation / installation.
   - Cost effective solutions compared with expensive radar and/or camera solutions on the market.

3. Did you collaborate with stakeholders outside of your company (authorities, local communities, NGOs, etc.) and if yes, with whom? Can you describe your experiences with these external stakeholders? Were you able to integrate community concerns into this project?

   The experimentation is being developed thanks to partnerships with technology providers, universities and research institutes, non-profits, startups, and ornithologist and chiropterologist specialists, through our Open Innovability® approach, which aims to seek out the best ideas and resources also outside of the Company. In this way, very specific and complementary fields of expertise have been brought on board to ensure a global approach in the definition of the experimental program.

   The massive experimental campaign will contribute to studying and understanding the impacts on wildlife and finding a strategy to protect biodiversity, improving the environmental and ecologist footprint. The results of this project could be also useful to increase social acceptability. In addition, these technologies installed in the wind parks could be used by specialists to carry out environmental surveys for research purposes or as local biodiversity observatories.

4. How did data enable this project and what data did you collect? Of the collected data, what was provided to regulators and authorities as part of the permitting process?

   Preliminary data coming from birds and bats monitoring conducted in EGP Wind Farms by independent specialist consultancies during the design of the plant and after the construction during the operation ones. The results of these monitoring are regularly provided to authorities. For this program the tests are on a pilot scale, easily scalable, the authorities are informed, also the results will be shared if required.

5. Please describe the experiences surrounding the permitting process for this project, including any bottlenecks you faced:
6. Please describe any permitting bottlenecks this project faced specific to land use change:
7. Did you receive public funding for this project? If so, please describe from which funding source (local, national, EU-level, international) and the application process you faced in attempting to secure this funding (including any special requirements conditional to the funding programme):

   No public funding have been received for the project development and execution.

8. Please choose at least **one** of the following questions to answer which is relevant to this project:
9. Does this project regenerate previously degraded natural habitats or ecosystems? If so, how was this achieved or how did your company integrate this restoration into the project?
10. OR
11. Does this project protect or provide alternative, undisturbed, comparable habitats for protected species? If so, how is this achieved or how did your company integrate this protection into this project?

    The use of technologies to detect and monitor flying wildlife allows us to understand their behaviour and population during the different seasons in the wind farm area and to detect

them automatically and in real-time. With this data, it will be possible to select and apply a strategy to protect the lives of animals and biodiversity. The systems validated can be used in the wind farms in operation to detect flying wildlife in real time and prevent mortality.

12. OR
13. If a previous project was found to be environmentally detrimental and your company was able to course correct to not only mitigate, but reverse the negative effects, how was this achieved?
14. OR
15. Did this project take into account effects on soil composition or the GHG impacts of land use change? If so, does this project comply with existing regulations around maintaining soil quality or land use, or does this project go beyond what is required? If so, what did you do in excess of the existing regulations?
16. Photos (if available):