

# Minimization of impacts of wind farms on biodiversity in Greece

PO.184

## A Summary of LIFE12BIO/GR/000554 project results



E. Tzen, K. Rossis / J. Fric, M. Tzali, A. Dimalexis  
CRES/NCC

### Abstract

Wind energy's ability to produce electricity without carbon emissions is expected to reduce the risk of potentially disastrous effects to wildlife from the climate change as well as to offer several environmental benefits, such as substantially reduction of water withdrawals and consumption, and decreased emissions of mercury and other sources of water and air pollution associated with the burning of fossil fuels.

Despite the benefits of wind energy, the siting and operation of wind farms, mainly in sensitive ecological areas, continues to be a source of concern for the biodiversity. The project "Demonstration of good practices to minimize impacts of wind farms on biodiversity in Greece, LIFE12BIO/GR/000554", aims to demonstrate and promote state-of-the art methods and approaches to improve the compatibility with the EU biodiversity conservation targets, and to develop prescriptions and guidelines that will enable Greek state authorities and wind farm developers to effectively plan, implement and regularly evaluate the performance of the mitigation technologies .

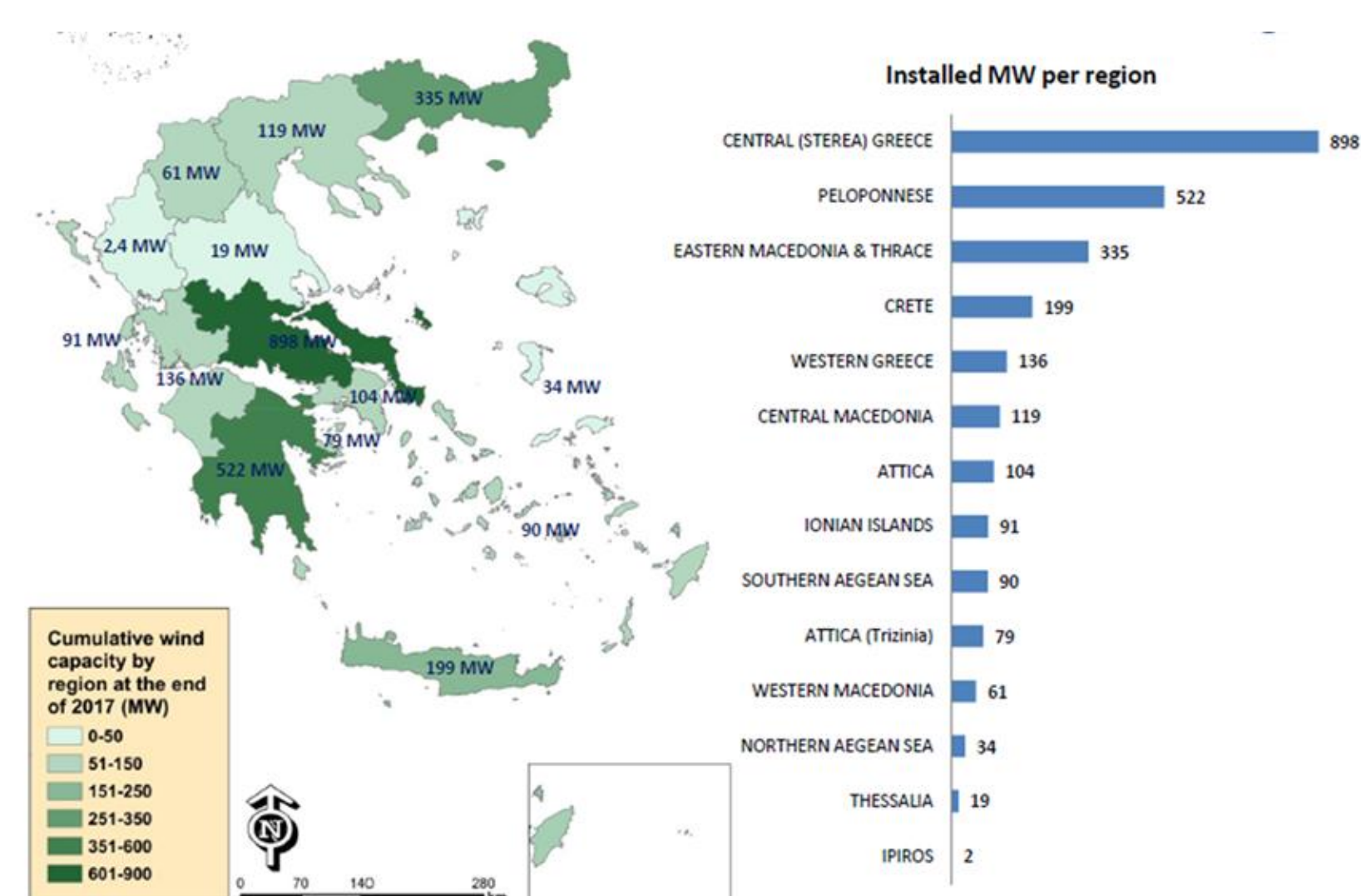
### Objectives

The extent and severity of the impacts on biodiversity from the wind farms installed at protected areas (Natura 2000) , greatly depends on:

- the proper wind farm sitting,
- the relevant environmental permits,
- the mitigation measures adopted, and in extreme cases on
- the effectiveness of compensation measures applied.

The project targets at the demonstrative implementation of integrated approaches for the mitigation of impacts on the biodiversity (birds and bats), during the operation of wind farms in accordance with EU guidance document "Wind energy development and Natura 2000", and on the basis of available novel and modern methods and technologies. The assessment of the extent to which the use of modern methods and technologies can reduce the impacts on biodiversity at protected areas-Natura 2000, whilst maintaining the power output of wind farms, has examined and important outcomes have been achieved. The main site for the demonstration of the modern technologies and methods is the 3MW Demonstration Wind Farm-Park of Energy Awareness (PENA) of the Centre for Renewable Energy Sources and Saving, CRES in Keratea, Attica. Moreover demonstration actions are also implemented at several areas of Greece and mainly at the area of Thrace, in north Greece.

In Greece 446 sites, with a covered land area of 35,982 km<sup>2</sup> and 22,796 km<sup>2</sup> sea surface have been characterized as Natura 2000. Around 27% of the total land area of Greece is in Natura 2000 Network.



Wind energy capacity in Greece: 2.69 GW (June 2018)

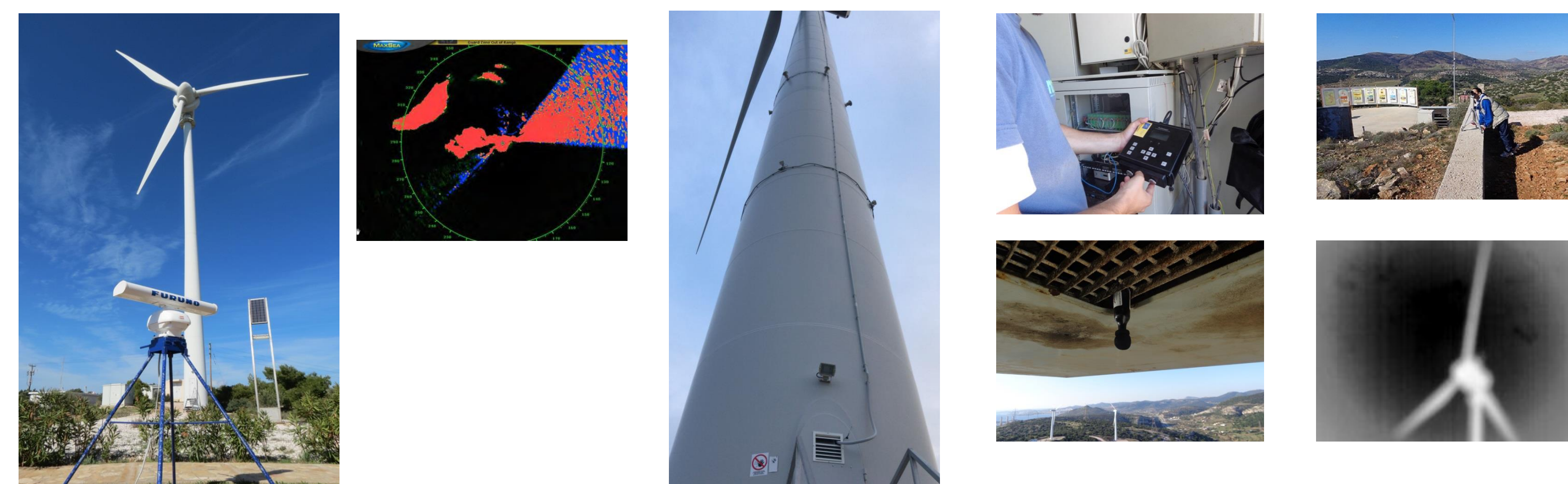
Source: Hellenic Wind Energy Association

### Methods

The technologies which are being operated and tested include:

- an ornithological radar, based on a marine surveillance radar, operating as an early warning system in association with visual observations by ornithologists

- a commercial video surveillance system, which acts as an early warning and bird dissuasion system, with the capacity to automatically control the operation of wind turbines, in association with visual observations for monitoring the efficiency
- three (3) different models of commercial automated bat detectors/recorders mounted on wind turbine nacelles in association with bat recording transects at ground level
- a commercial thermal camera.



### Results

Modern technologies and best practices can help to avoid and/or to reduce to a tolerable level the impacts of the wind farms on the biodiversity during their design, construction and operation. An important issue during the operation of the wind farms is the use of the so called "early warning systems", such as ornithological radars, video surveillance systems, thermal cameras and bio-acoustic monitoring systems. These systems along with traditional methods of data collection (e.g. optical observations), and the information on the responses of birds to wind turbines, can help to reduce the impact on biodiversity during the operation stage, as well as significantly improve the biodiversity data on the space use within a planned wind farm site during the planning stage.

### Conclusions

The development of wind power offers the promise of contributing to renewable energy portfolios to reduce greenhouse gas emissions from carbon-based sources, which contribute to accelerating climate change. Given the projected growth of wind power generation, it is crucial that future analysis of the impacts of wind energy development take into account population effects for wildlife which is considered sensitive to impacts of wind farms. These impacts can be eliminated first of all with the proper siting of the wind farms. When properly sited the impacts, these can be further reduced with the use of early warning systems and mitigation measures, when required.

The project LIFE 12BIO/GR/000554 is implemented by CRES in collaboration with the NCC Ltd, with the financial support of the European Union LIFE Instrument and the Hellenic Green Fund.



### References

1. European Commission, 2010. Wind energy developments and Natura 2000. Wind energy development in accordance with the EU nature legislation. This document has been prepared with the assistance of Ecosystems Ltd. (part of the N2K Group EEIG) under contract to the European Commission (contract N° 070307/2008/513837/SER/B2). Council of Europe, Brussels, Belgium
2. <https://www.eea.europa.eu/data-and-maps/dashboards/natura-2000-barometer>
3. European Communities, 2002. Assessment of plans and projects significantly affecting Natura 2000 sites. Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC. Luxembourg

