

## Assessment of the landscape impacts of wind energy: the case of Italy

### Research framework

Although wind energy is one of the fastest growing, most mature and economically competitive renewable energy technologies, its deployment faces significant challenges due to low local acceptance among societal stakeholders. Factors such as restrictive regulations, disinformation, misinformation and concerns about the alteration of landscapes, negative impacts on biodiversity, ecosystems and health hinder the diffusion of new wind turbines.

Wind farm projects are subject to environmental impact assessment (EIA), a procedure introduced in the EU by Council Directive 85/337/EEC, in most EU Member States. Although EIAs are procedures of a technical-administrative nature, they are often influenced by political assessments. Political assessments involve the evaluation of certain impacts that cannot be easily mitigated or compensated for (e.g. bird strikes) or those impacts that are difficult to quantify (e.g. impacts on the landscape).

Landscape impacts in particular are among the most important factors considered in the EIA of wind farms. Especially in areas with high scenic value and those where the local economy is largely based on tourism, great importance is given to visual impact; this is the case in several regions of the Italian peninsula. Data show that, within the EIAs, the Ministry of Cultural Heritage and the regions give a negative opinion on new wind farms in about 80% of the cases<sup>1</sup>. As a result, the development of wind energy in Italy, and thus the achievement of the 2030 decarbonisation targets, is jeopardised by the high number of wind farm projects that do not pass the environmental assessment.

### Goals

The thesis aims at representing the past and current state of the assessment of the landscape impacts of wind farms in Italy. To do so, the candidate will:

- Produce a literature review on the impact of wind farms on the landscape and their acceptability.
- Investigate the actual constraints on the use of wind energy in Italy, depending on:
  - The different environmental components to be preserved (e.g. fauna, landscape).
  - The type of restriction imposed (e.g. incompatible area, area of special attention).
- Analyse and characterise the previous national and regional environmental impact assessments of wind farms:
  - The technical characteristics of the proposed wind farms.
  - The compensatory measures planned at local level, if any.
  - The opinions of the institutions consulted (e.g. Ministry of Cultural Heritage, Regions), the reasons for a possible negative opinion, and the technical prescriptions required, if any.
  - The requests received from citizens and environmental associations during the public consultation.
  - The outcome of the procedures.
- Develop a spatially explicit database from the information collected in the previous steps.
- Develop a spatial analysis and produce statistics on the acceptability landscape impacts from wind farms in Italy and its regions. This analysis should employ widely-available data on landscape topography (Digital Landscape Models, DLMs) and land use, in combination with so-

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<sup>1</sup> [Il miraggio delle autorizzazioni eoliche in Italia: fermi nove progetti su dieci | QualEnergia.it](#)

## Master's thesis proposal

called “viewshed” analysis, in order to try to correlate these with the acceptance or rejection of wind park planning proposals.

- Investigate the possible strategies of public authorities and private investors to achieve a higher acceptance of wind farms.

### Required skills

- Language: Italian (mother tongue or C1)
- Software: Python and/or QGIS

### Other information

The thesis is developed in collaboration between the [Kelso Institute Europe](#) (Berlin), the [ETH Zurich](#) and [Politecnico di Torino](#). The research falls within the activities related to the “Wind in My Backyard” (WIMBY) Horizon Europe project. Working location is at any of these institutions.

### References

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