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THE EUROPEAN WIND ENERGY ASSOCIATION



Wind Energy the Facts- Offshore

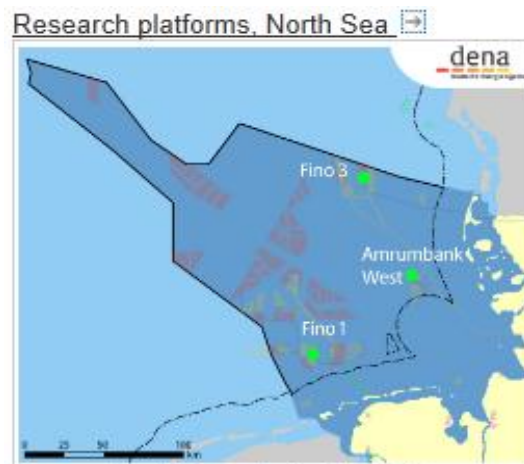
Session 3: Broader issues- Local environmental issues

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- ❖ Offshore wind deployment
- ❖ Trends
- ❖ Social research on offshore wind energy
- ❖ Potential environmental impacts
 - Visual impact
 - Noise impact
 - Impacts on marine mammals, sea birds
- ❖ What is being done?
- ❖ What can be done in the future?
- ❖ Environmental Impact Information tool
- ❖ Conclusions

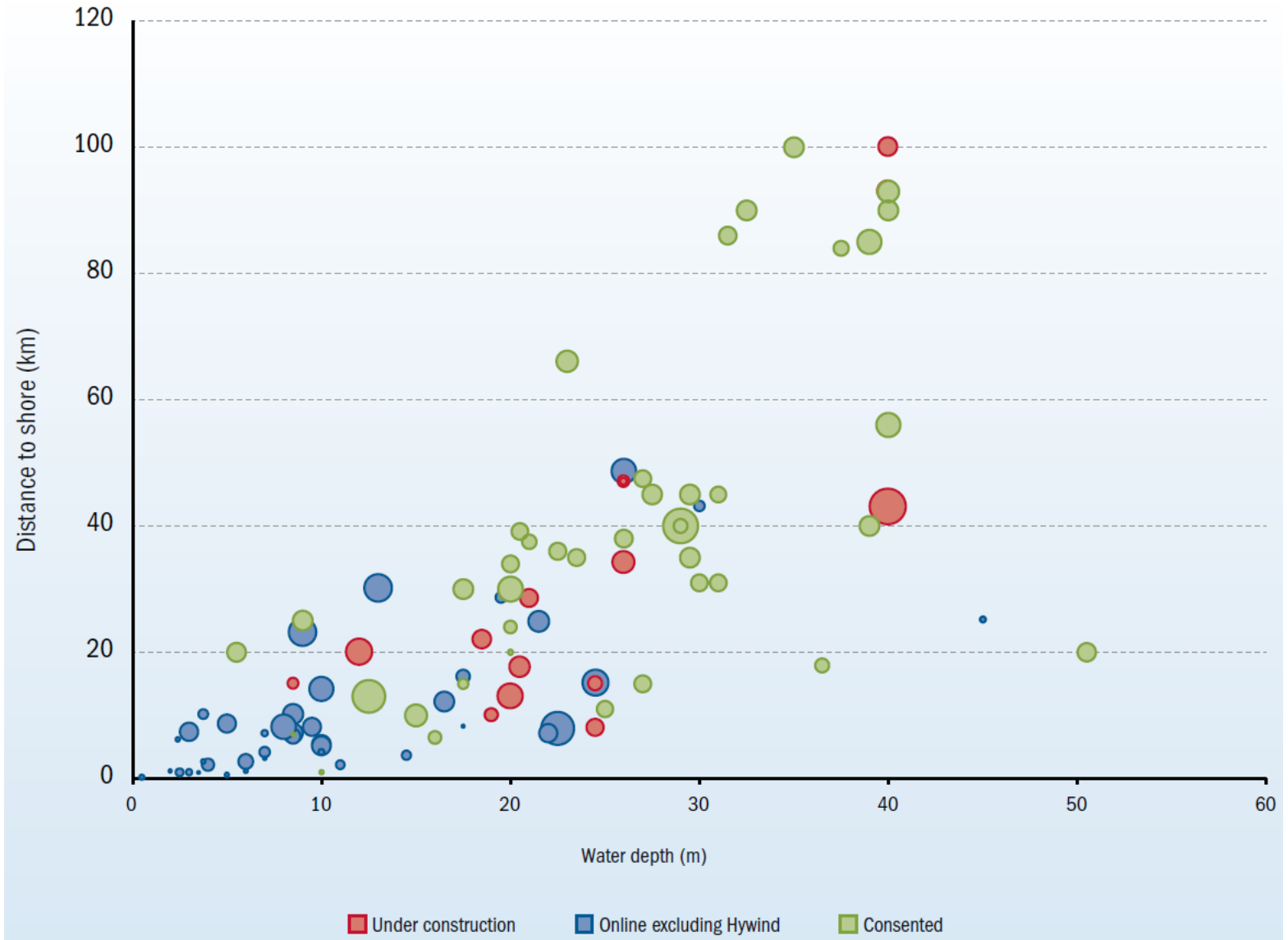
Offshore wind deployment

- 40 GW offshore wind by 2020 and **150 GW** by 2030
- Wind farms move further from the shore in deep-water, distant locations
- In the past: shallow waters, high ecological value (breeding, resting, migratory seabirds)
- Offshore wind projects are more complex than onshore
 - Wide variety of environmental factors to be considered, plus technical and engineering challenges
- Experience gained over the years; research platforms



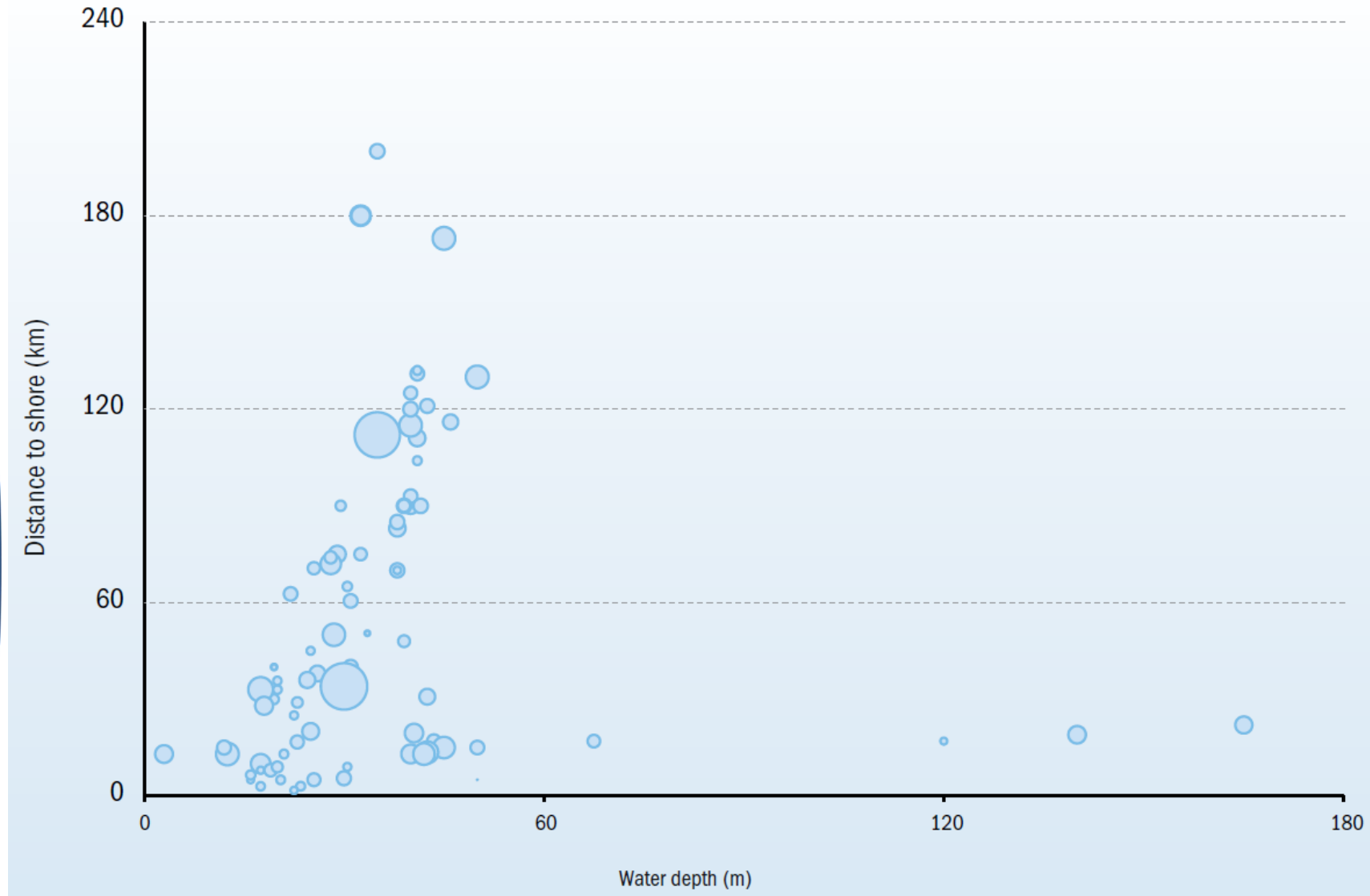
(Courtesy of DENA)

Distance and water depth of wind farms



Trends

Distance and water depth of wind farms



Social research on offshore wind energy

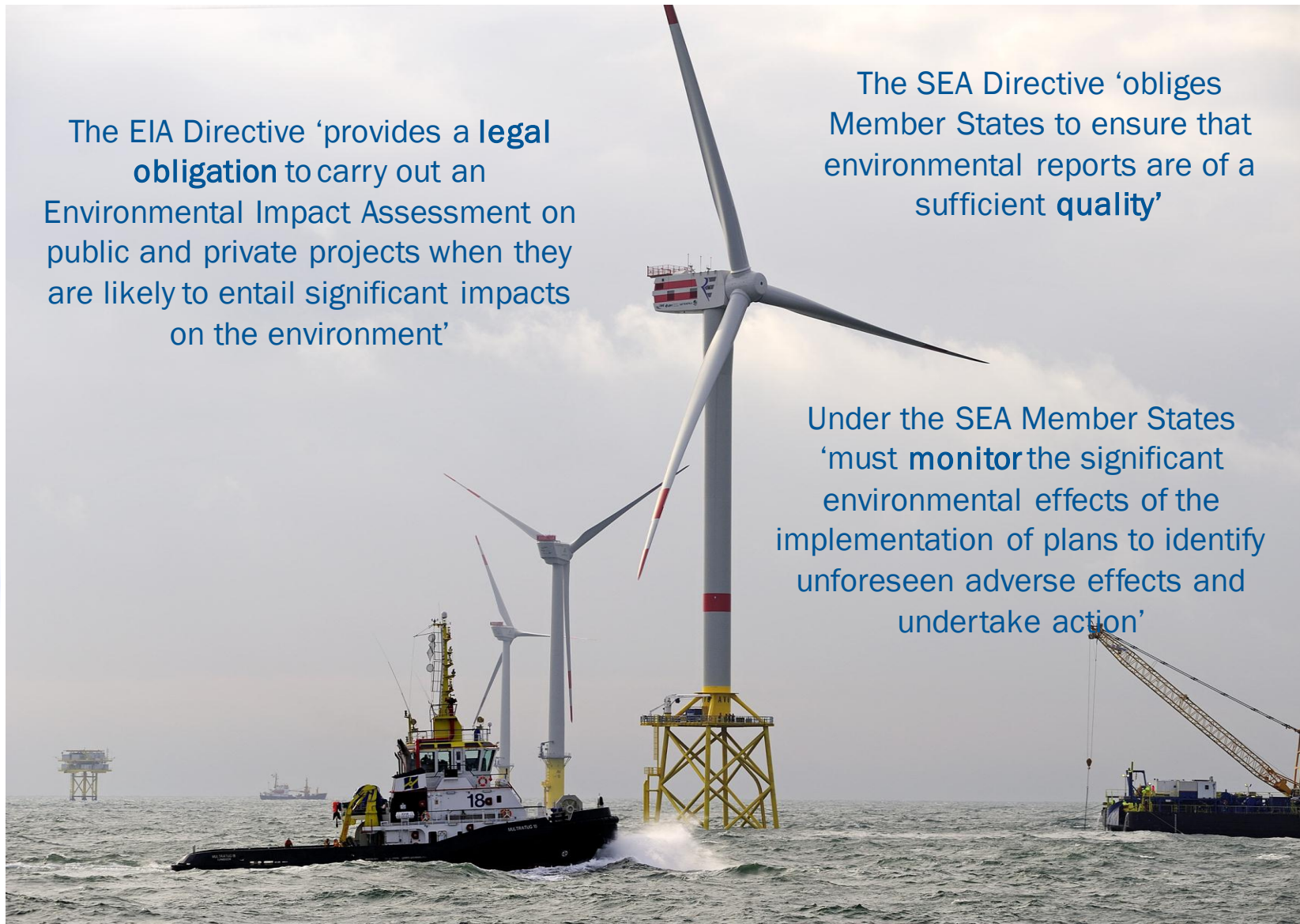


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The EIA Directive 'provides a **legal obligation** to carry out an Environmental Impact Assessment on public and private projects when they are likely to entail significant impacts on the environment'

The SEA Directive 'obliges Member States to ensure that environmental reports are of a **sufficient quality**'

Under the SEA Member States 'must **monitor** the significant environmental effects of the implementation of plans to identify unforeseen adverse effects and undertake action'



(Courtesy of EON)

Potential Environmental Impacts (i)



Impacts on **sea birds** (collision risk, habitat loss or displacement, disturbance and barrier effects)

- Avoid areas of conservation importance
- Increase visibility of wind turbines
- Baseline surveys for appropriate siting and farm layout
- Collect data for on intensity and distribution of bird movements
- Further research: use of radar and thermal animal detection systems (TADs), population modeling

Underwater noise (threshold shift in hearing, masking)

- Set of acoustic measurements during construction and operation
- Propagation losses, noise-dose concept to determine contour areas
- No evidence that marine mammals avoid noisy areas (acceptable deviation)
- Use of scaring devices, bubble curtains and soft-start/ramp-up procedures

Potential Environmental Impacts (ii)

Impacts on fish and marine mammals

- disturbance of small- and large-scale orientation (especially migratory species)
- impediment of foraging activity
- physical barrier
- habitat loss as fish may leave area
- disturbance of behaviour and stress

Other impacts

- Benthos
- Macrophytes
- Navigation
- Landscape and visual intrusion

What is being done?

The wind industry is actively working on mitigation techniques and best practices

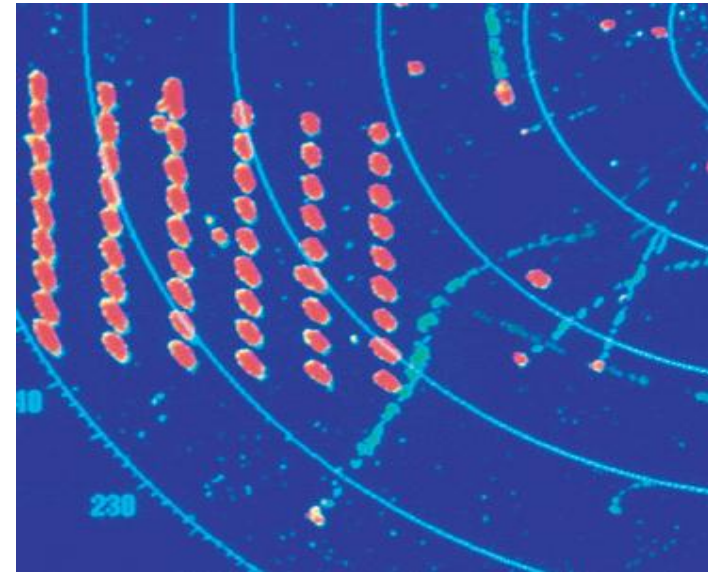
- Design monitoring programmes that clearly link pre and post construction monitoring
- Wind farms provide natural habitat for organisms living on the sea bed also enhance local environment for fish and marine mammals (NordzeeWind study)
- Examples of environmental research projects:
 - Guidelines for boat-based and aerial platform bird surveys
 - Collection of underwater noise data during piling activities
 - Measurements of E/M fields from power cables



(Courtesy of IMARES)

What can be done in the future?

- Technical mitigation measures: remote techniques (video, microphones, laser and pressure sensors)
- Reliable models for predicting bird collision risk
- Proper communication and information strategies
- Early involvement of stakeholders
- Careful planning and siting



Environmental Impact Information tool (i)



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Environmental Impact Information Tool

1. Make the right connections

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2. Obtain key information

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NREAP

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Environmental Tool

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4. Improve your profile & visibility

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Keyword : offshore

SEE

Advanced search >>>

Search results

- **An immersive path-based study of wind turbines' landscape. A French case in Plouguin - 16/07/2008**
Wind farm development leads to visual and acoustic impacts. Since changes to landscape commonly cause opposition, it is vital to gain more knowledge in order to improve impact assessments. In this pap...
- **Assessing and mitigating visual impacts - 10/01/2005**
The purpose of this memorandum is to guide New York State Department of Environmental Conservation personnel when evaluating the aesthetic and visual impacts of proposed wind farms. This document is i...
- **Assessing impacts of wind farms on birds - 28/03/2006**
This article explores the potential effects of wind energy development on birds, based on data collected from existing wind farms. Data on collision risk, disturbance to the level of displacement and ...
- **Assessing impacts of wind-energy development on nocturnally active birds and bats: a guidance document - 01/01/2007**
The purpose of this document is to guide decision-makers, scientists, developers, and other stakeholders involved in wind energy development with regard to methodologies for investigating nocturnal bi...

Enable EWEA/members to answer the increasing generic, transnational and more organised concerns about wind energy and its impacts on the environment

Challenge: Keeping it updated- your support is appreciated

Provide up-to-date scientific information :

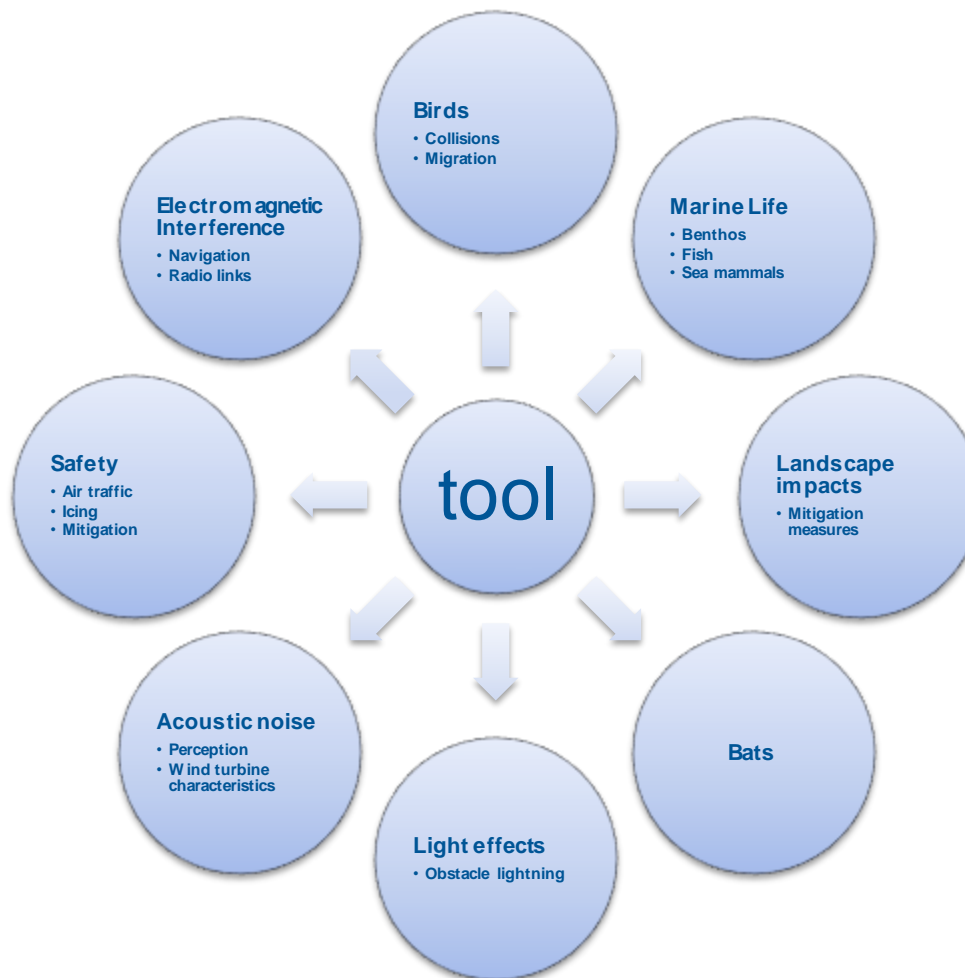
- potential impacts of wind energy on biodiversity
- potential mitigation and compensation measures

Main target audience:

- Policy makers; media; NGOs and nature conservation organisations
- Industry (project developers, operators and manufacturers)



Environmental Impact Information tool (ii)



•Environmental impacts in balance with the available alternatives (protect biodiversity through careful planning and mitigation measures)

•Wind industry to address potential impacts in a systematic and responsible manner, (development of the sector)

•The tool is constantly being monitored and updated (new challenges and issues)

Browse by category: summary text of issues of concern, a list of scientific references and abstracts

Literature review of eight main areas - Search by geographical scope

Identify key experts on the mentioned topics

Conclusions

Strategic approach and planning

Design monitoring programmes for supporting pre & post-construction monitoring

Remote sensing technologies to assess the risk of bird collisions and collect data for migration routes

Opposition is mainly encountered during the planning phase, acceptability is higher after commissioning of the wind farm

Ecological site characteristics: site, season and species-specific

Impact depends on location and water depth of surrounding sea

Further environmental research, need for enhanced international coordination and exchange of information



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Thank you!

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