



EWEA
THE EUROPEAN WIND ENERGY ASSOCIATION



Survey of noise regulations and guidelines across the EU: A report from the National Associations Network

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EWEA Members – Across entire supply chain



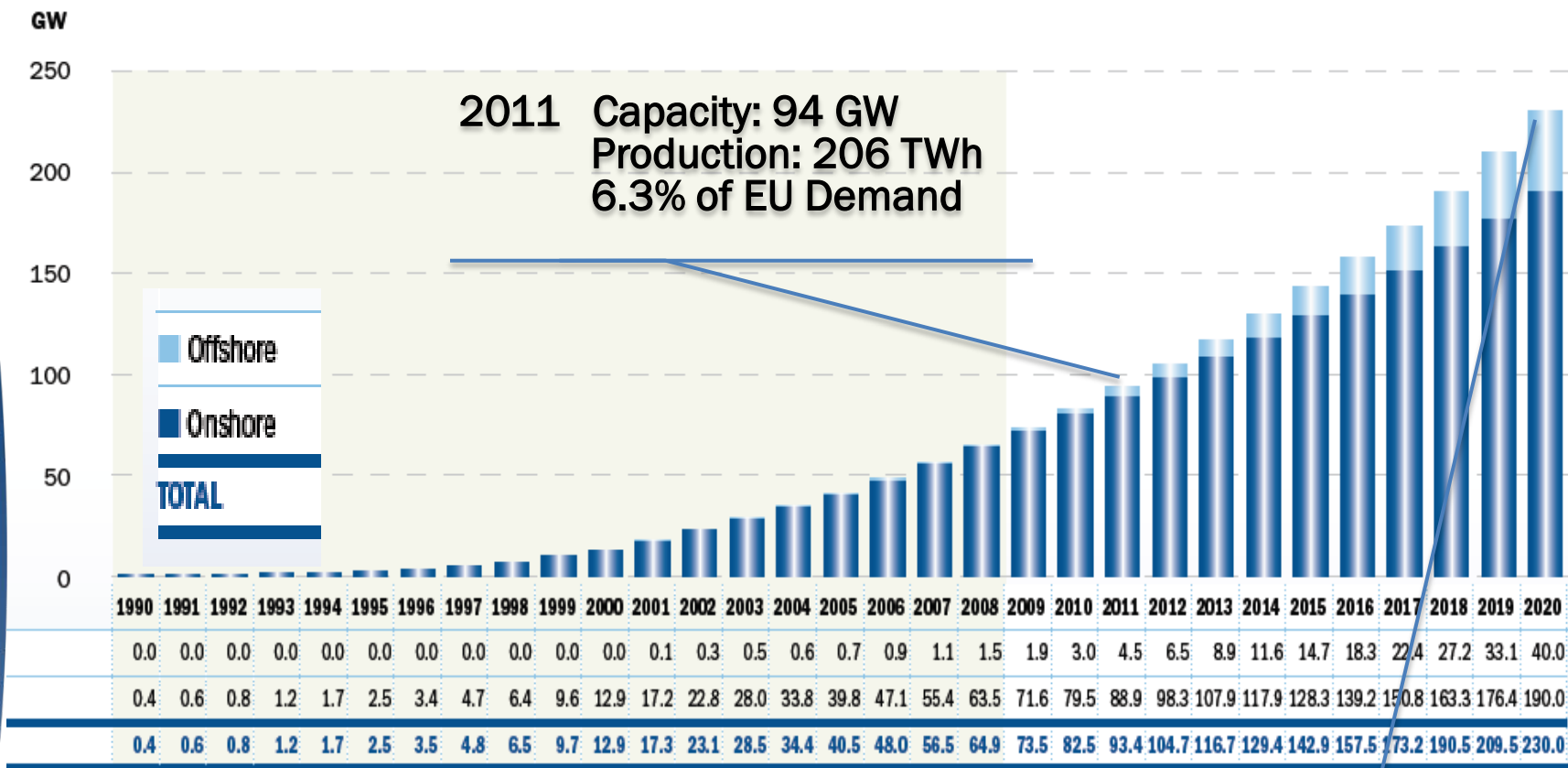
GE Energy



SIEMENS



Wind installed capacity- Development & 230GW scenario to 2020



Similar targets in other 2020 scenarios...
EIA = 199 GW NREAPs = 213 GW EC = 222 GW

**2020 230GW
581 TWh
16% of EU demand**

Environmental Impacts Information tool

Members' lounge home

1. Make the right connections
- 2. Obtain key information**
3. Get massive discounts
4. Improve your profile & visibility
5. Influence policy

Presentations
Documents & Research Notes
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NIREAP
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Environmental Tool

Environmental Impact Information Tool

Latest additions:

- Update of UK shadow flicker evidence database: Final report - 01/03/2011
- Change in public attitudes towards a Cornish wind farm: Implications for planning - 28/01/2007
- Short-term ecological effects of an offshore wind farm in the Dutch coastal zone; a compilation - 28/01/2011
- Wind turbines no obstacle to development of Important Bird Area (IBA): A case study - 08/01/2011

BROWSE BY CATEGORY | SEARCH FOR DOCUMENTS | SEARCH FOR EXPERTS

Quick search

Keyword :

[Advanced search >>>](#)

Search results

- **Danish offshore wind: key environmental issues - 11/01/2006**
This book describes the experiences and challenges of environmental issues in relation to the two large-scale demonstration offshore wind farms Horns Rev (80 turbines, 160 MW) and Nysted (72 turbines,...
- **Greening Blue Energy: Identifying and managing the biodiversity risks and opportunities of offshore renewable energy. - 20/10/2010**
The International Unit for Conservation of Nature (IUCN) together with E.ON Climate & Renewables and the Swedish International Development Cooperation Agency (SIDA) have joined forces in a pro...
- **Guidance document: Wind energy developments and Natura 2000 - 20/10/2010**
The document provides guidance on how to ensure that wind energy developments are compatible with the provisions of the Habitats and Birds Directives. The key provisions of the EU's biodiversi...

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)

Challenge: Keeping it updated- support from members

EWEA surveying the National Associations

- The noise survey aims to map noise legislation, monitor practices and trigger discussions on upcoming regulations
 - Perception, annoyance in residential areas
 - Summary of regulations in surveyed countries
 - Bibliography
- Other examples of research (2011-12):
 - Interpretation of N2000 guidelines in EU MS
 - ‘No go’ areas: definition, best practices, problems
 - H&S legislative frameworks, minimum distance requirements
 - Radar operation

EWEA's NAN Noise Survey

- Rationale
 - Noise legislation
- Noise emission limits
 - Noise measurement standards and control
- Mitigation measures
 - Towards a noiseless wind turbine
- Overview of best practices
- Challenges for the wind industry
 - Harmonisation of noise standards?

Rationale

- Noise is a considerable factor when it comes to planning and social acceptance
 - Associated concerns with visual impact and perception
- Numerous studies have investigated the potential effects from wind turbines (higher frequencies, low frequency, underwater noise)
- 14 surveyed countries: BE, BG, CH, CZ, DE, DK, EE, FI, IE, IT, NL, PL, PT, UK

| | |
|------------------------------------|---|
| Mechanical (components in nacelle) | x |
| Aerodynamic (movement of blades) | ✓ |
| Infrasound | x |

Noise legislation

- In most countries, noise legislation is based on national regulations
 - Wind turbine-specific guidelines
- Emission limits: proximity to dwellings and residential, recreational areas are a concern
 - Allowable limits are categorised by area, timing
- Denmark is the only country to have ratified the low frequency limits

| | DAY (dBA) | DAY (dBA) | NIGHT (dBA) | NIGHT (dBA) |
|------------------------------|-----------|-----------|-------------|-------------|
| Residential areas/ dwellings | 40 | 55 | 35 | 45 |
| Recreational areas | 40 | 48 | 35 | 43 |

Noise measurements

- Noise measurement standards and control usually conform to the IEC 61400-11 std
- In most countries, noise emissions forecasting and measurements are carried out at the immediate vicinity of the houses (receptor's side)
 - 'Immission Act'
- Allowable levels usually depend on wind speeds
- Several countries have set night limits and some, evening limits
 - Differentiation between indoor, outdoor measurement methods

Noise mitigation techniques

| Mitigation technique | Country |
|---|---|
| Noise measurement and modelling during EIA or pre-planning | All countries, EIA requirement |
| Landscaping, planting hedges & trees, noise barriers | Estonia, Poland, Portugal |
| Sound proofing windows and walls | Estonia, Portugal, UK |
| Reduce turbine speed, curtailment or shut down at night | Finland, Belgium, Italy, Poland, Portugal |
| Electronic damping controls for specific wind speeds and directions | Ireland |
| Burry lines | Italy |

Towards a noiseless wind turbine

The wind industry has been using mitigation and compensation techniques for reducing noise emissions.

- Optimise blades for noise and turbulence, maximise yield
- EU funded study SIROCCO: sound can be reduced by 1-1.5 dB(A) for 58 m rotor blade and 2-3 db(A) for a 94m rotor blade by changing the shape
- Aero-acoustic optimised airfoils, trailing edge serrations for low- noise turbine models
 - To be retracted at higher frequencies when they add up to standard noise output

Best practices

List of Best practice examples

Publish guidelines on noise calculation methodology (Flanders, Belgium)

Early community involvement/ publicise noise models (majority of the countries)

Design mitigation measures before submitting planning application

‘Early community involvement is key to communicate the scope, improve understanding and perception and help with local acceptance’

Challenges for the wind industry

- In most of the reporting countries, wind projects can be legally challenged on the grounds of noise
 - Citizens usually address concerns during consultation phase, sometimes post-construction (additional mitigation measures)
 - Arbitrary introduction of min distances for receptors in conflict with national policies
 - Each project should be assessed on its merits
- Harmonisation of noise standards across the EU?
 - No clear consensus, most countries are sceptical about the potential advantages

Conclusion

- The wind industry has been using mitigation and compensation measures to reduce emissions
 - Technological progress, collaborative research
- Noise modelling, compilation of acoustic data and publication of measurements are essential
 - Provide information in a systematic and competent way
 - Guarantee these levels will be maintained
- Early involvement and effective communication helps with perception and ultimately local acceptance



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Thank you!

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