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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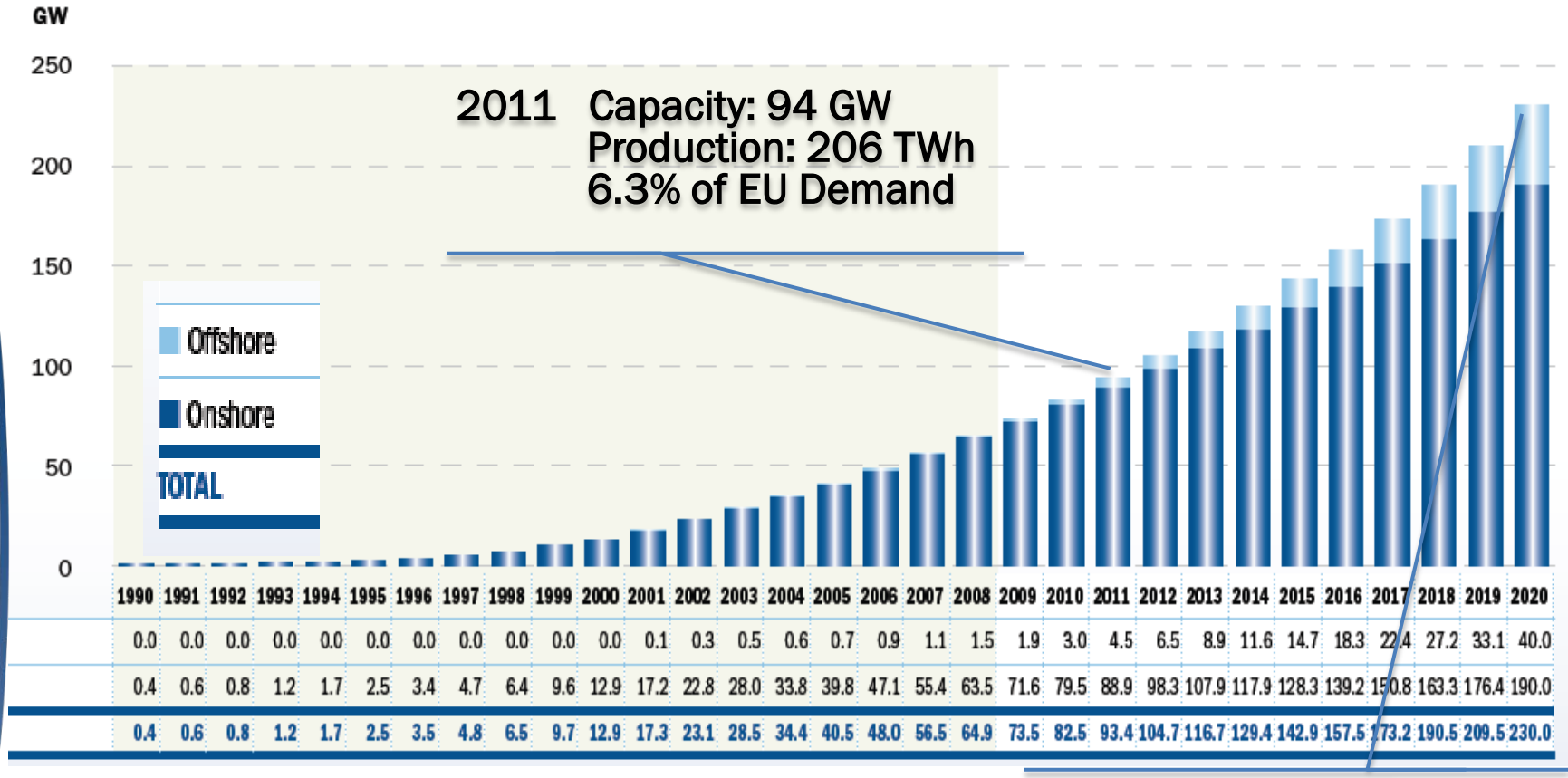
EWEA Members – Across entire supply chain

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

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)
- 14surveyed countries: BE, BG, CH, CZ, DE, DK, EE, FI, IE, IT, NL, PL, PT, UK

Mechanical (components in nacelle)	✗
Aerodynamic (movement of blades)	✓
Infrasound	✗

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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