



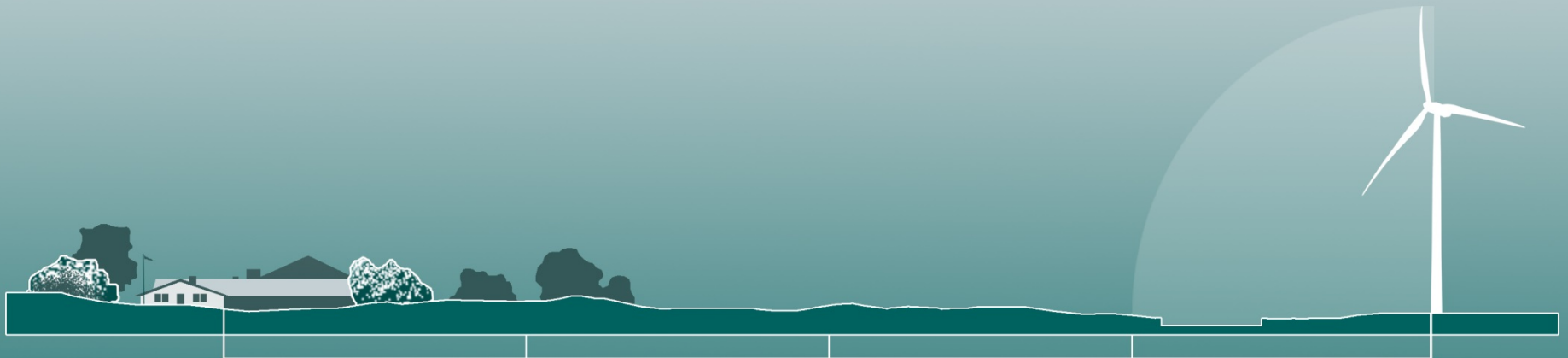
| Onshore Wind Turbines in Denmark

28. Januar 2019

Janne Christensen

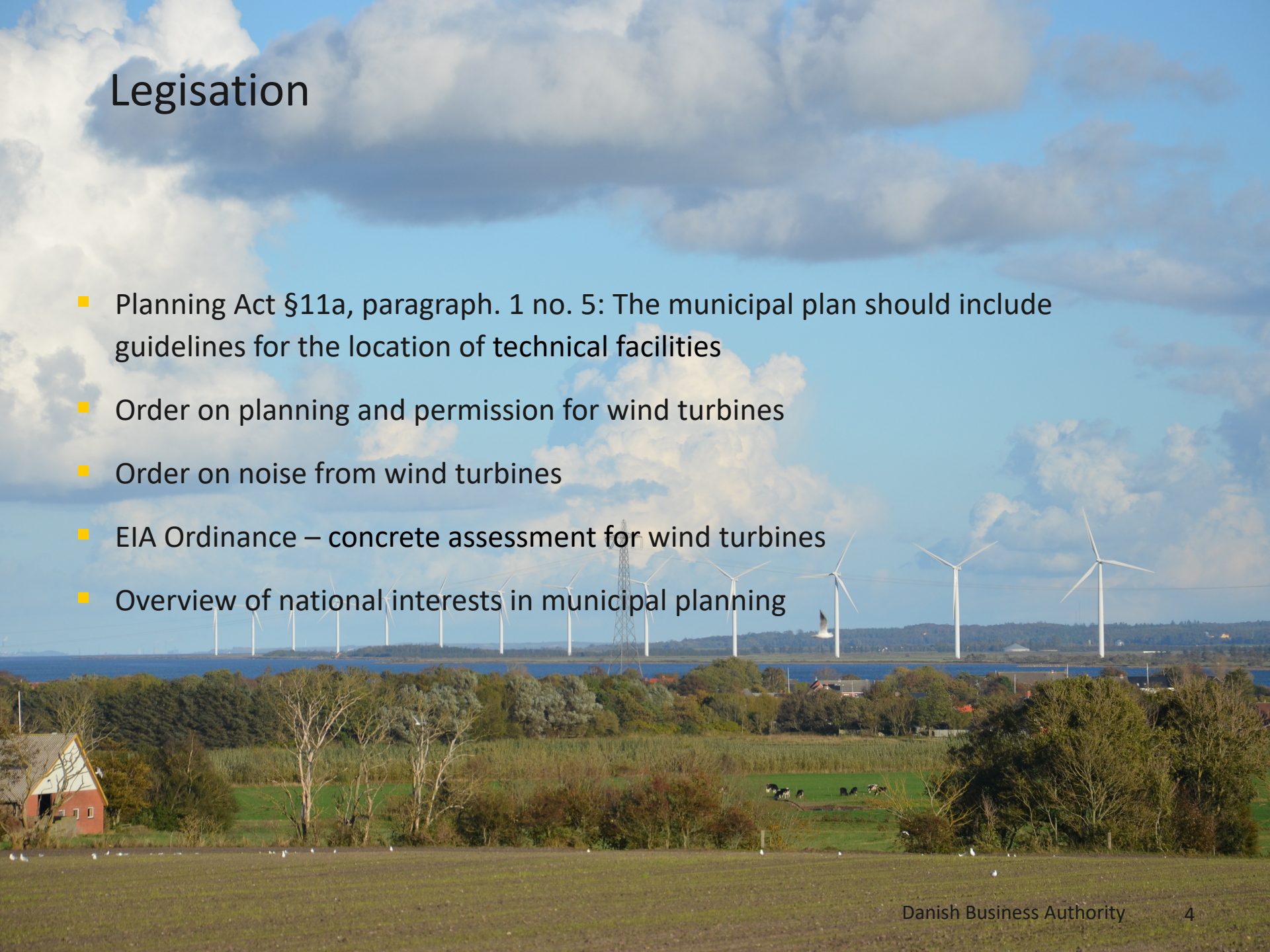
Modern wind turbines today are 100-150 m high

- The older wind turbines from the 1990's are typically 50-80 m high
- Modern onshore wind turbines are usually up to 150 m high
- Difficult to perceive size in most situations
- The higher the turbine is the farther away it must placed
- The distance requirement: Minimum 4 x total height for residential

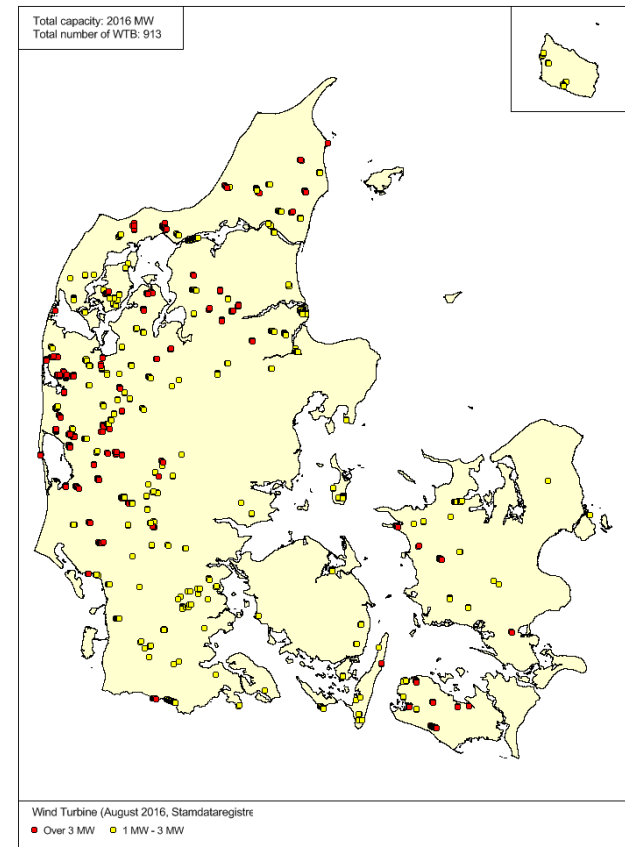
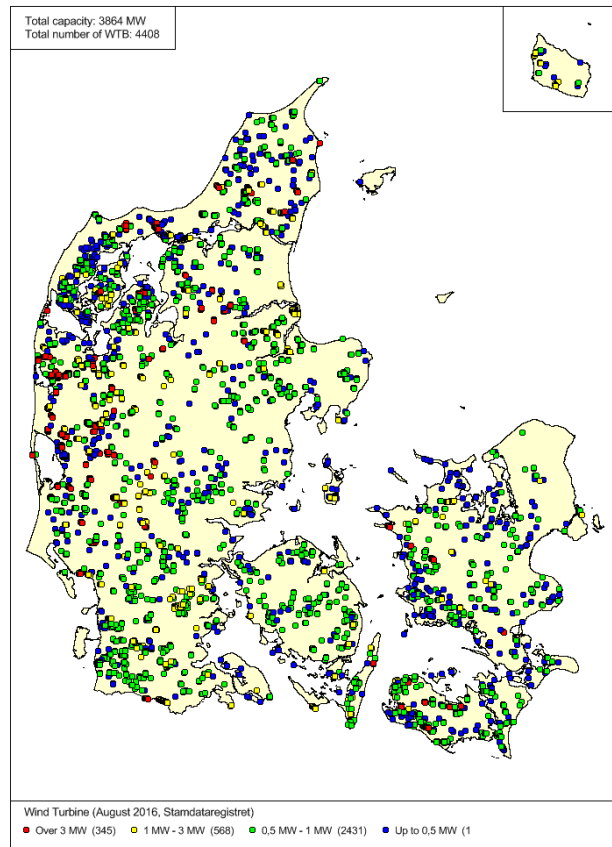


Legislation

- Planning Act §11a, paragraph. 1 no. 5: The municipal plan should include guidelines for the location of technical facilities
- Order on planning and permission for wind turbines
- Order on noise from wind turbines
- EIA Ordinance – concrete assessment for wind turbines
- Overview of national interests in municipal planning



Capacity and location of onshore wind turbines



The wind turbines of the future

Energy Agreement of 29. June 2018

Establishes a roadmap for achieving the government's goal of at least 50% renewable energy in 2030.

Establish three offshore wind farms in Denmark by 2030. Situated far from our coastlines, offshore wind turbines cause fewer negative impacts,

Agreed to significantly reduce the number of onshore wind turbines during the agreement period and in subsequent years, fra app. 4300 til 1850 by 2030

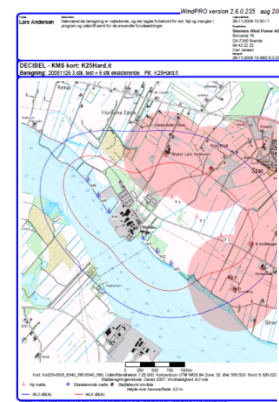
A shift from land-based to offshore wind turbines recognises the experiences of people who have experienced inconveniences caused by wind turbines near their homes, and the resulting declines in their property values.

A recognition the necessity of granting the municipalities powers to issue permits for the construction of modern wind turbines in accordance with current practice. The future fewer but higher wind turbines.

Change the order on planning and permission for wind turbines – no height limitation in the future

The municipalities are responsible for planning for onshore wind turbines

- There can only be installed turbines in designated areas
- Defining areas is done by balancing the interests and involvement of citizens and other stakeholders
- For large wind projects both a local plan and an EIA report is to be prepared
- The planning for the specific project begins when the municipality receives an application
- The EIA report will highlight the turbines impact on the surroundings, including visualizations and calculations of noise, shadow, etc



Kommuneplanlægg nr. 25 til Struer Kommuneplan 2001-2012
og nr. 10 til Thyholm Kommuneplan 1987-2008

Temaplan for vindmøller
i Struer Kommune



Januar 2009

LOKALPLAN 05-001
VINDMØLLER, DRØSTRUP
SKERPING
August 2008



Where to establish wind turbines – and where not to

■ Legal limitations:

- Nature protection (Natura2000)
- Forests and protected areas
- Nature conservation, eg. coastal protection
- Residential – distance (4 times residential) and noise requirements

■ Municipal designation

- Valuable landscapes
- Cultural environments etc.

Example: EIA and noise regulations

A distinction is made between noise limits to be observed to the housing in the open countryside and noise limits in the areas of noise sensitive land use.

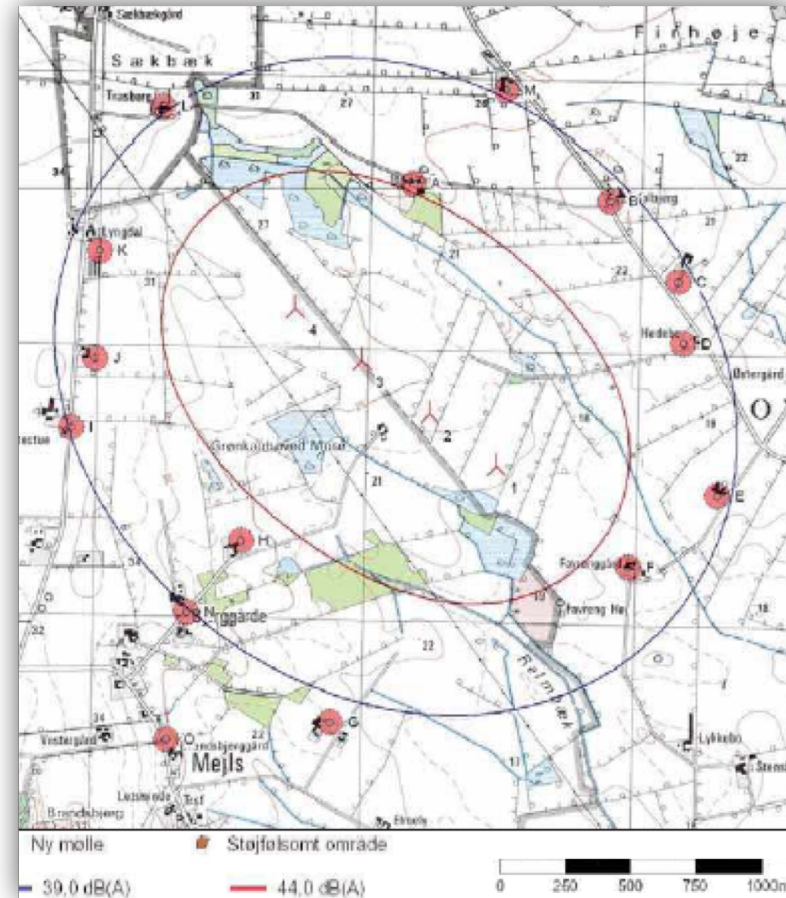
A distinction is made between both the high and low frequency noise (LFN).

Noise limits:

By 6 m/s: 37 dB/42 dB – LFN 20 dB

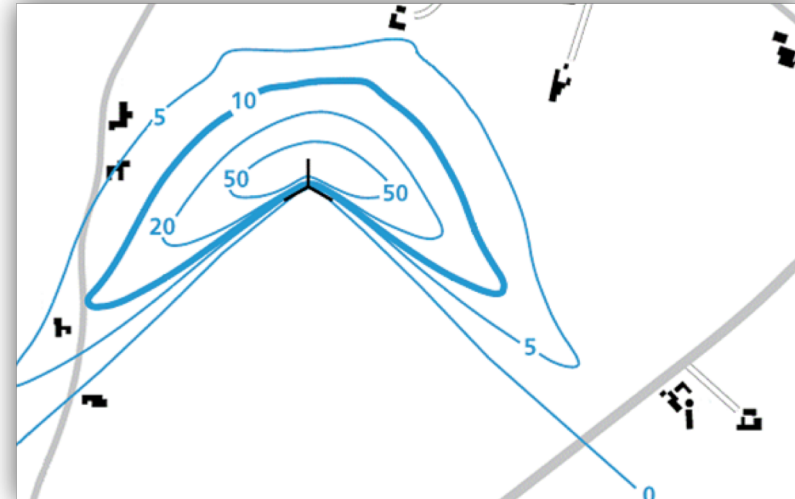
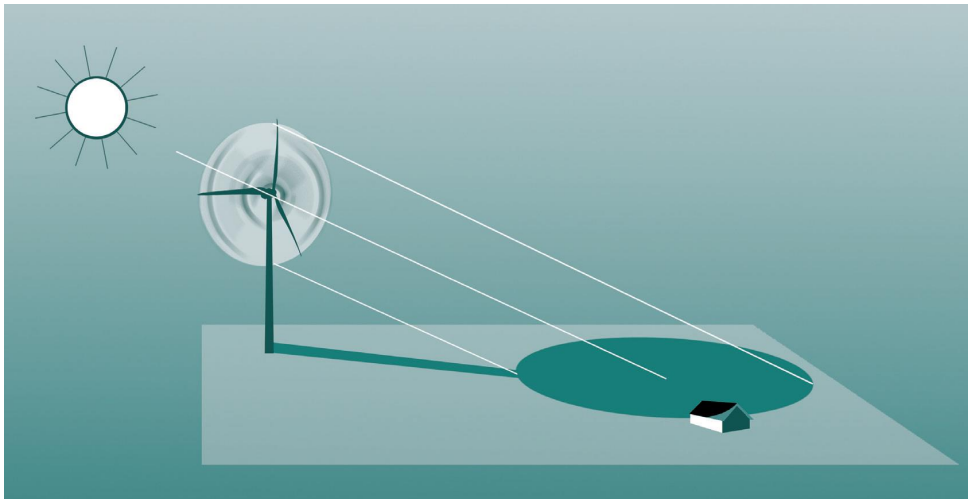
By 8 m/s: 39 dB/44 dB – LFN 20 dB

There can not be made exemptions from the noise rules



Example: EIA and shadow casting

The guidelines recommend that neighboring properties are not applied shadow casting for more than 10 hours annually.



Act on the promotion of renewable energy "RE-act"

Existing initiatives

Land depreciation scheme: You can report a claim for compensation for loss of value. It is free to lodge a claim for compensation within 6 x wind turbine height.

Buy Legal System: All in the municipality has the opportunity to become co-owner of the new wind turbines. Min. 20% of a wind project has to be offered in units. Neighbors within 4.5 km has the first right to buy shares.

Guarantee: The state provides a guarantee of up to 500,000 DKK to local windmill cooperative.

New initiatives

The wind industry is working together with the Danish Energy Agency on a new sale option scheme for protection for the affected landowners. Ex. 4 to 6 times the total height of the wind turbine

The wind industry is working on a green scheme to support the municipalities incentives to promote renewable energy

Authorities and responsibilities

Municipalities: Overall responsibility for planning for onshore wind turbines

Business Authority: National interests in planning

Environmental Protection Agency: Noise Rules and interests of nature and landscape

Energy Agency: Energy, subsidies, turbines, etc.

Energinet.dk: RE Act schemes

