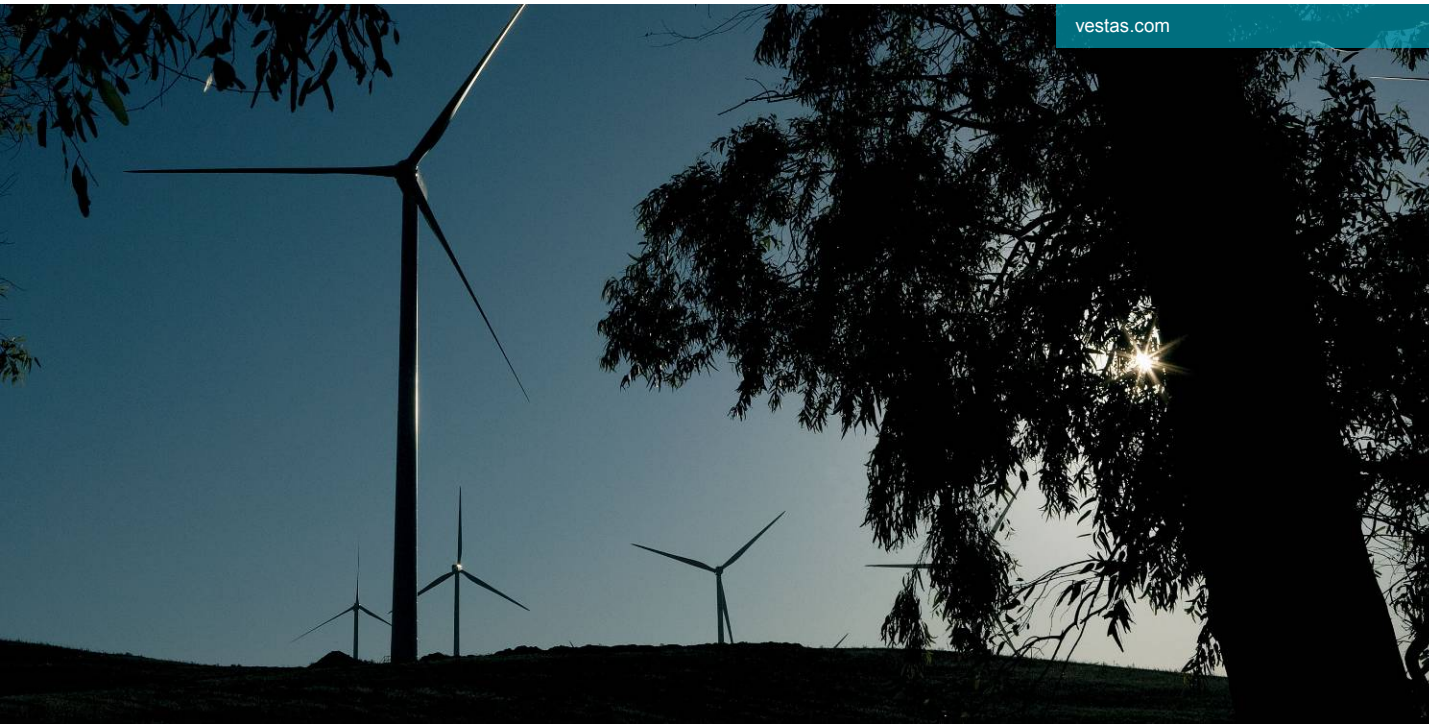


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# Wind Energy & Spatial Planning

We@Sea Meeting, 24th November 2009



***Vestas***<sup>®</sup>



## 2020 scenario on wind turbine development

- The likely scenario for main part of EU market with relatively densely populated areas for wind turbine size:
  - Project size in the 30-50 MW range
  - Due to lack of space in populated areas, turbine unit sizes increase => fewer units to generate same power output
  - More constant wind at higher altitudes drives turbine size not to “grow into heaven”. Estimate 2020: 150 m hub height.
  - Considering recent innovations in blade design, load reduction and intelligent operation, the turbine size is likely to level out around approx. 6 MW for onshore turbines with a relatively large rotor.

## Step 1: Adopt a comprehensive, long-term planning approach for wind energy

- **Avoid ad-hoc space allocation**, which leads to
  - Unnecessary conflicts with nature and neighbours
  - Unnecessary delays in planning and construction
- **Steer wind power siting in spatial plans**
  - Identify available wind resources
  - In national/regional siting plans, designate specific areas for on- and offshore wind development
  - Set binding wind power targets and timelines for all administrative levels
- **Integrate planning for grid development and wind siting**
  - Clarify where grids must be reinforced and extended



## **Step 2: Obtain local acceptance with focus on sharing of benefits, rather than compulsory regulations**

- **Allow municipalities and/or neighbours to take share in wind power projects**
  - E.g. municipalities in Denmark need to be offered option to invest 20% in local wind farms
- **While listening to local concerns, aim to streamline permitting procedures**
  - Concentrate all permitting processes, ideally a single comprehensive permit process
  - Limit permitting process to six months, with firm deadlines set for responses

## Step 3: Limit noise and visual impact through modern turbines, wind farm clustering, and repowering

- **Integrate wind farms into the landscape in aesthetic ways**
  - Cluster turbines into wind power bases
  - Allow modern turbines to optimise space-output ratios
  - Implement restrictions on shadow-flickering
- **Minimise noise disturbance**
  - Install modern turbines with reduced noise levels relative to their megawatt capacity
  - Implement relative noise limits that take into account local background noise



## Step 4: Align actions and regulations between VROM and EZ

### Current situation:

- SDE is supporting high-MW machines suitable for high wind sites. These machines are less suitable for medium wind sites (IEC-II and IEC-III) due to the MW - rotor size ratio and high noise levels.
- Wind turbines optimized for medium wind sites are discouraged by SDE due to their high energy production in relation to installed MW.
- New Noise regulation will be implemented in 2010. In order not to jeopardize goals for 2011 and beyond, alignment with EZ is a prerequisite.

# “Alignment” VROM - EZ

Vestas turbines in the Netherlands, onshore 6,5 m/s

Type	Rotor	Noise	MW	Production	SDE	Production/SDE	VROM	EZ
V90-2.0MW	90m	103 dB(A)	2.0	90	67	0,74	X	
V90-3.0MW	90m	107 dB(A)	3.0	100	100	1		X
V112-3.0MW	112m	105 dB(A)	3.0	150	100	0,67	X	

# Why SDE does NOT work

- Letter from Minister van der Hoeven to Tweede Kamer Highlights
  - In order to achieve and build a wind farm with windturbines of 6 to 8 MW you need to:
    - Increase tariff to €0,096
    - Increase Full Load Hours – hence subsidy - from 2200 to 3095 full load hours.
    - Give an additional One Time Grant between 104 and 116 mln euro.
  - Questions, input for the general discussion:
    - Does installing of windturbines of 6 to 8 MW indeed result in a higher production output in kWh per installed MW?
    - What is the real Cost of Energy = Cost per kWh?

# General Thought and Take Aways

- There are no poor wind areas in The Netherlands.
- Our neighbouring countries are rushing towards their goals with what we call “poor wind areas”.
- Wind turbines can be installed easily but also removed after use easily. There are no long term consequences.
- Cost of energy  $\neq$  Cost of MW installed.
- There are specific turbine designs for all Dutch wind classes.

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# Thank you for your attention

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