Roadmap offshore wind energy in the Netherlands

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Dutch policy on wind energy - December 2014
Overview

1 Background
   • Energy agreement
   • Goals for energy policy, incl. offshore wind

2 Road Map
   a. Cost effectiveness
   b. Time schedule

3 Meeting the goals
Energy Agreement for Sustainable Growth

More than forty organisations laid the basis for a robust, future-proof energy and climate policy enjoying broad support.

The purpose is achieving a wholly sustainable energy supply system by 2050.

Objectives
- a saving in final energy consumption of averaging 1.5% annually;
- a 100 petajoule saving in the country’s final energy consumption by 2020;
- an increase of sustainable energy from 4.4% currently to 14% in 2020;
- a further increase to 16% in 2023;
- 15.000 full-time jobs.
4450 Mw off shore wind power by 2023

A total of 3450 Mw will be contracted for by means of phased procurement procedures commencing in 2015.

With the assumption that the cost of offshore wind power will be cut by some 40% in the 10 years ahead.

The Government ensures that there is a robust legal framework that makes it possible to scale up offshore wind power.
Background: SDE+
2 Road Map

a. Cost effectiveness

b. Time schedule
Road Map/Cost Effectiveness

• Offshore grid (€ 3 bln)

• Location sites (€ 1.2 bln)

• Tender/subsidy process (?)
Road Map/Cost Effectiveness/Offshore Grid

Wind farm connects directly to platform
Aansluiting wind op zee in Nederland – schematisch
Road Map/Cost Effectiveness/Location Sites

• Corner stone: Standard platforms 700 MW

• 5 locations 700 MW

• Near shore cheaper than far shore

• 12 mile zone = political risk
Implement./cost effectiveness/location sites
Roadmap – routekaart (2)

2015: 2 x 350 = 700 MW Borssele
2016: 2 x 350 = 700 MW Borssele
2017: 2 x 350 = 700 MW Zuid-Holland
2018: 2 x 350 = 700 MW Zuid-Holland
2019: 2 x 350 = 700 MW Noord-Holland
Road Map/Cost Effectiveness/Tender Process

Old way: A lot of risk surcharges in bids:

- Uncertain site info (costly)
- Development costs farms that will not be subsidized
- Costs or lost revenues because of appeal permits
- Long time between permits and subsidy (renegotiate with manufacturer, updating permits)
- Financial arrangements with “neighbours”
Road Map/Cost Effectiv./Tender Process (2.0)

- Government provides:
  - Sites for 350 MW
  - Site info (wind speed, geographic conditions, marine data)
  - (environmental) constraints for the project developers

- Winner (lowest bid) gets:
  - Site
  - Permit with flexibility
  - Subsidy for 15 years

- Financial close process can start right after winning tender
Designated wind farm zones (National waterplan)

- General rules
  - Offshore Windfarms

Wind farm site decision

- Grant decision and consented

Building windfarm
Road Map/Time Schedule

- Roll out plan (26th September 2014)
- Robust legal framework
- Call for tenders 2015
- Designation new areas in 12 mile zone
Road Map/Time Schedule/Robust Legal Framework

Offshore wind energy bill: into force 1st of July 2015

1. Introduces wind farm site decision (‘kavelbesluit’)
2. TenneT (TSO) can prepare offshore grid (since September 2013)

Electricity and gas bill: into force 1st of January 2016

1. TenneT (TSO) is allowed to build and operate offshore grid
2. Responsibility and liability between offshore grid operator (TenneT) and windfarm developer
Road Map/time schedule/call for tenders

- No regret site Borssele

- Decision wind farm sites (incl. EIA and crossings)
  - Kavelbesluiten (incl. MER en kabelkruisingen)

- Soil, water, wind investigations wind farm sites
  - Grond-, water en windonderzoeken locatie

- National consenting procedure TenneT substation and export cables
  - Rijkscoördinatieregeling platform TenneT inclusief kabel naar en over land

- If needed, technical and commercial conditions substation, incl delivery date
  - Evt. locatieafhankelijke ‘aansluitvoorwaarden’, o.a. opleverdatum platform TenneT

- SDE+ tender wind at sea 2015
  - Regeling SDE+ tender windenergie op zee 2015
Meeting the goals
Designated wind farm zone Borssele

- Designated in NWP1

- Why deploying Borssele first?
  - less conflicts with other functions
  - grid connection on land faster to realize

11 november 2014
Site decision

- Overall planning
- Electrical infrastructure: location platforms, redundancy, 33 or 66 kV, dataconnections, helicopters, etc.

- Site data: morphodynamics, wind measurement data, GIS, certification, etc.
Division wind farm zone Borssele (2)
Environmental Impact Assessment:

Aiming for wind farm site decisions with a bandwidth for wind turbine types and technologies.
Proposed activity and consideration of alternatives (2)

<table>
<thead>
<tr>
<th>Subject</th>
<th>Bandwidth</th>
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<tbody>
<tr>
<td>Power individual wind turbines</td>
<td>3 – 10 MW</td>
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<tr>
<td>Tip height individual wind turbines</td>
<td>125 – 250 meter</td>
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<td>Tip lowness individual wind turbines</td>
<td>25 – 30 meter</td>
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<td>Rotor diameter individual wind turbines</td>
<td>100 – 220 meter</td>
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<td>Spacing between wind turbines</td>
<td>≥ 4D</td>
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<td>Number of blades per wind turbine</td>
<td>2 – 3</td>
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<td>Type of substructures</td>
<td>Monopile, jacket, tripole, tripod, gravity based structure</td>
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<tr>
<td>Type of foundations</td>
<td>(Mono)piles, suction buckets, gravity based structures</td>
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<td>Installing piles</td>
<td>Vibratory, hammering, boring, suction</td>
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<td>In the case of hammering: hammer energy related to turbine type / pile</td>
<td>1,000 – 3,000 kJ, depending on soil conditions and diameter foundation</td>
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<td>In the case of hammering: diameter pile(s) and number of piles per turbine:</td>
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<td>Jacket</td>
<td>4 piles 1,5 – 3,5 meter</td>
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<td>Monopile</td>
<td>1 pile 4 -10 meter</td>
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<td>Tripod</td>
<td>3 piles 2 - 4 meter</td>
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<td>In the case of a foundation without hammering: dimensions at seabed:</td>
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<td>Gravity Based</td>
<td>≤ 40 x 40 meter</td>
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<td>Suction Bucket</td>
<td>Diameter bucket: n.t.b.</td>
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<td>Electrical infrastructure, voltage level</td>
<td>33kV or 66kV</td>
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<td>infield cables</td>
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# Planning Winfarm zone Borssele

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Legend:
- Lead time
- Milestones

Opening tender

Meeting - Bijeenkomst Tender Borssele 25 December 2015
Workshops

1. 15th July 2014: wind farm sites
2. 15th September 2014: site data and electrical infrastructure
3. 15th October 2014
   1. Tender SDE+ (RES grant)
   2. Ecology
4. 17th November 2014: site data preliminary results
5. 15th December 2014: SDE+
6. First quarter 2015
7. Second quarter 2015

Possible issues: technical project description, EIA, draft wind farm site decision
Websites

Any remaining questions?

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Ministry of Economic Affairs

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