Seminar on grid analysis

Thursday 5 March, 14.00-16.00

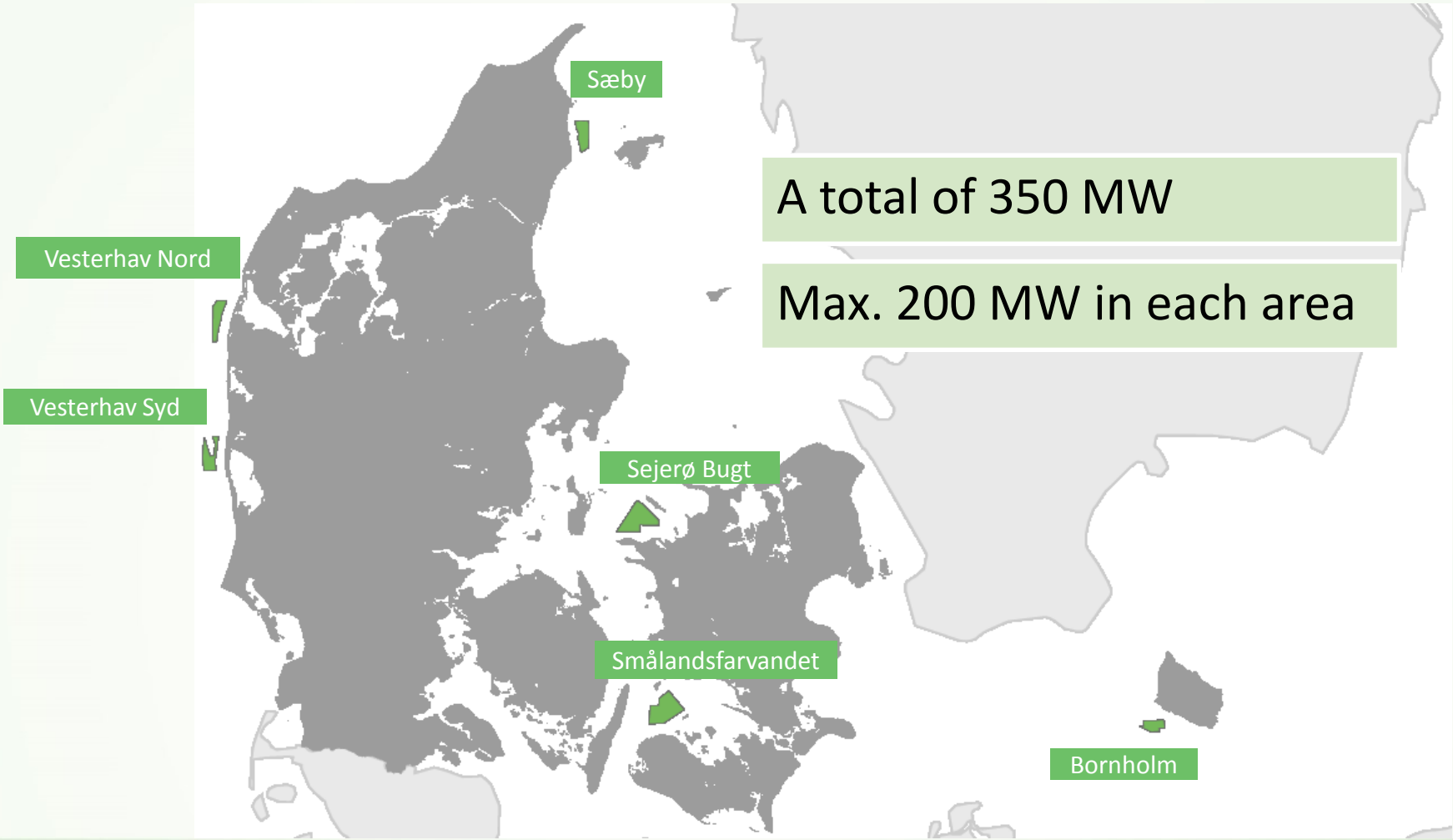
Danish Energy Agency

Nearshore Tender of 350 MW

DANISH ENERGY AGENCY

450 MW nearshore wind power

Welcome



A total of 350 MW

Max. 200 MW in each area

Nearshore

Preliminary surveys

Seminar on MetOcean and wind related studies 27 February 2015

Seminar on grid analysis: 5 March 2015

EIA reports for public consultation: April- June 2015

2015 2016

The tendering procedure

Contract notice: February 2015

Preliminary tender specifications: March 2015

Prequalification deadline: 26 May 2015

Preliminary tenders October 2015

Negotiations: Late 2015/beginning of 2016

Final tender specifications: Beginning of 2016

Deadline for final tenders: April 2016

Concession contract: Soon after

ENERGY

450 MW nearshore wind power

Agenda

Welcome – by the Danish Energy Agency

Information on the amendment to the Executive order on Grid Connection – *by the Danish Energy Agency and Energinet.dk*

Grid analysis – technical and economic analysis for the 6 sites – *by Energinet.dk*

Questions

GRID CONNECTION – NEW LEGISLATION

DANISH ENERGY AGENCY

450 MW nearshore wind power

Reasoning behind the changes

- The changes have been made to ensure the optimization of the socio-economic cost of grid connection.

- The purpose is that the project developer includes the costs of the grid connection and thus recognizes all costs when selecting a location for the project.

Changes to the Executive Order

The Executive Order no. 1063 of 7. September 2010 on grid connection, has been amended by Executive Order nr. 220 of 2. march 2015.

Highlights:

- New section 6: regulates ”open door” procedure and nearshore tenders
  - Changes to the location of connection point
  - Definition of acceptable grid voltages
- The metering point for grid losses for production is situated at the connection point
- New definitions: among others a definition of a ”supply point”

A new section 6 of the Executive Order

A clear segregation of ownership

- Responsibility and cost for establishment, operation and maintenance belong together.
- Responsibility and cost separate at the grid connection point, i.e. at the transition from the concession owner's internal collection grid and the grid routing onshore to the collective electricity supply grid.
- The overall grid connection should be established appropriately – in a socio-economic context.
- Therefore in setting cable routing, cable dimensions and voltages, account should be taken for the total costs, subsequent grid losses and maintenance.

Responsibilities and costs borne by the owner of the concession

- The owner of the concession must supply the total output at one electrical point onshore and at a voltage agreed with the grid company or transmission company.
- The owner of the concession must operate and maintain the internal collection grid up to the connection point, and bear all costs, risks and losses associated with this grid.
- The owner of the concession must cover all costs of acquisition and site development of the area required for expansion of the collective grid at the connection point.
- The owner of the concession is also liable for any additional costs caused by specific landscape and environmental requirements at the connection point, e.g. camouflage requirements.

Responsibilities and costs borne by the grid company or the transmission company

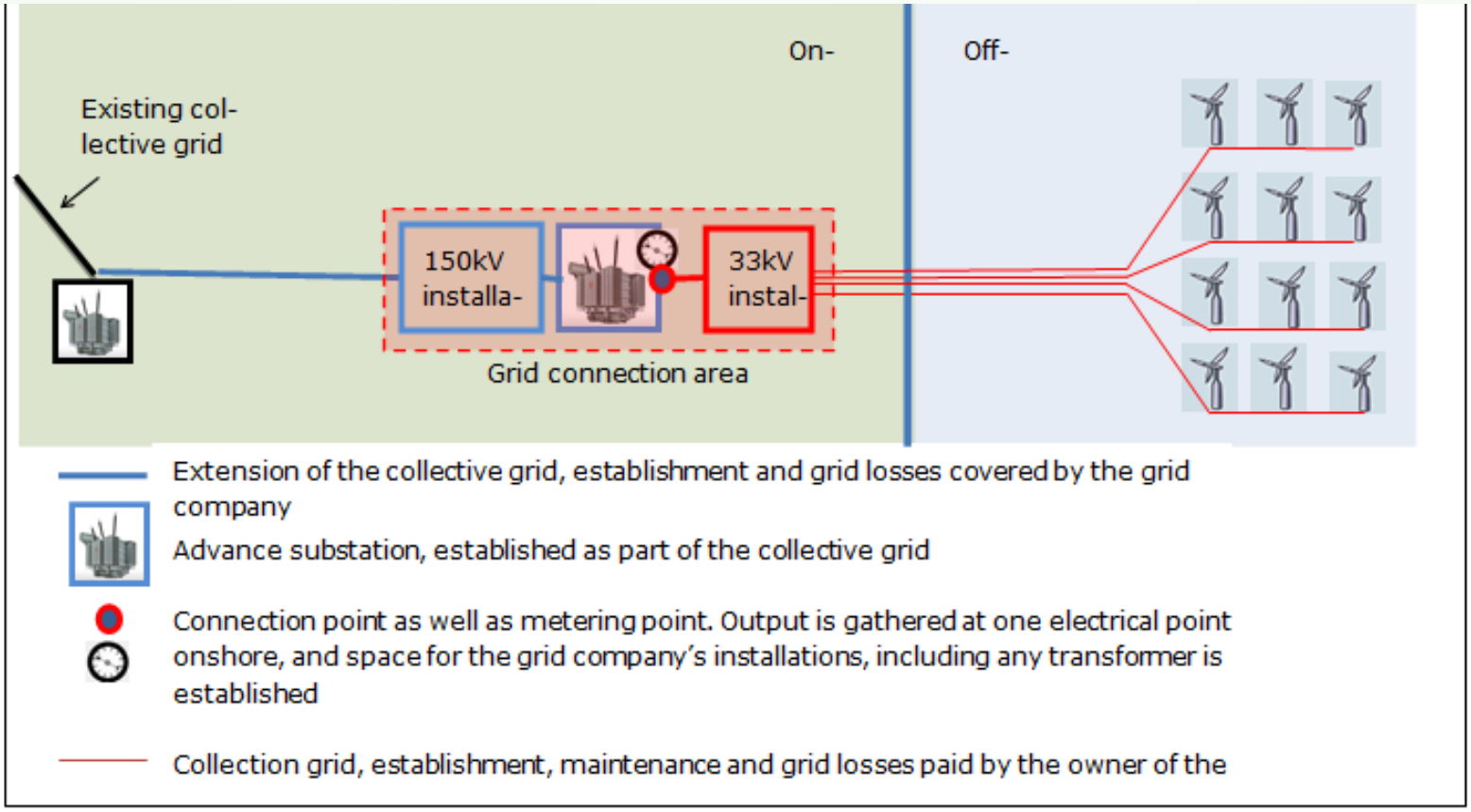
- The grid/transmission company must connect the concessions owner's grid to the collective electricity supply grid.
- The local grid company is responsible for connection at voltages less than 100 kV and the transmission company (Energinet.dk) is responsible for connection at voltages more than 100 kV.
- From the connection point, the collective electricity supply grid is established, owned and operated by the local grid company or the transmission company.
- The grid/transmission company decides, establishes, operates and maintains the technical installations required at the connection point. They also cover cost for expansion of the collective grid, e.g. a new transformer.
- If the owner of the concession has special requests in addition to the socio-economic solution, he must finance them himself.

Practical management of the grid connection

- Only limited by existing voltage levels in the grid, the concession owner is free to optimize the internal collection grid up to the connection point.
- Besides normal voltage levels in the existing grid, 33 kV must be accepted at the grid connection point.
- Based on the total capacity and voltage level, the optimal solution in the collective grid is determined.
- The optimal collective grid solution determines the technical installations required at the connection point.

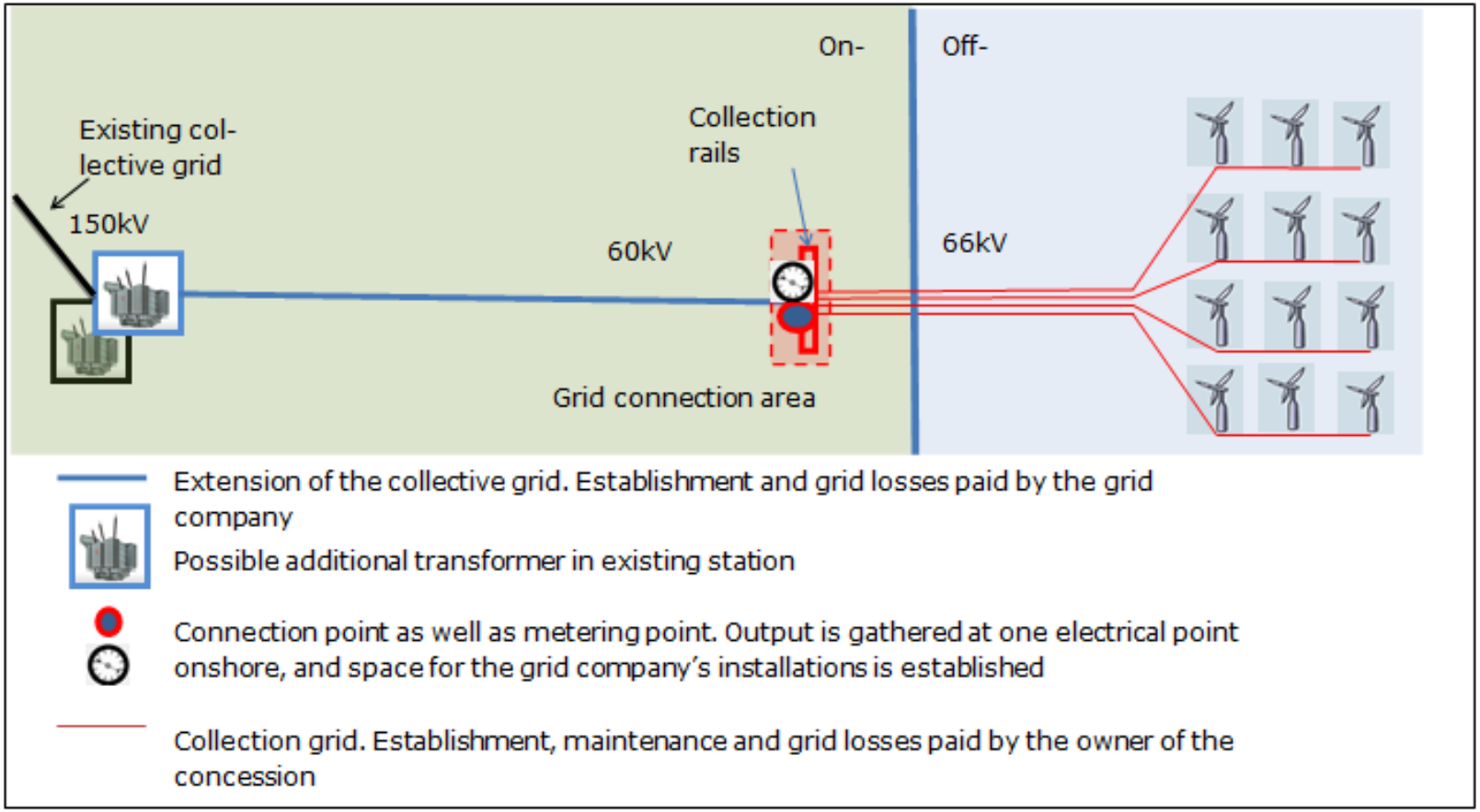
- Under open door rules, the “concession owner“ is free to locate the connection point, but technical requirements must be fulfilled.

Possible grid connection at low voltages



Example for supply of total output of 33 kV, and where, because of grid losses in the collective grid, it is necessary to establish an advance 150/33 kV substation.

Possible grid connection at high voltages



Example for supply of total output of 60 kV, and where it is optimal in a socio-economic context to transport the output at 60kV onwards to an existing station.

Establishment of cable routing onshore and security

- The owner of the concession is to negotiate with and compensate local land owners, if the cable routing onshore is to run through their land.
- Up to and including the connection point, this is the responsibility of the concession owner.
- Cost linked with the process or compensation for land owners must be paid by the owner of the concession.

Security and compensation

- Nearshore tenders follows the “open door” rules.
- The dimensioning of the collective grid is done on the basis of a socio-economic perspective. Any additional safety is paid by the concession owner.

- The grid company is not liable for financial losses imposed on the concession owner, but must act without undue delay

- In accordance with section 35 and section 34(3) of the Promotion of Renewable Energy Act, the owner of the concession can be compensated for breakdowns in the transmission grid from the connection point.

Establishment of cable routing onshore and security

- If production from the owner of the concession is to go into the distribution grid, the owner of the concession must provide a bank guarantee corresponding to the total cost of the local grid company.
- If production from the owner of the concession is to go into the transmission grid, Energinet.dk (the TSO) will take over responsibility for transformation from the connection point, and in this case no bank guarantee for the project will be necessary.

Follow us on www.ens.dk/nearshorewind

DANISH ENERGY AGENCY

450 MW nearshore wind power