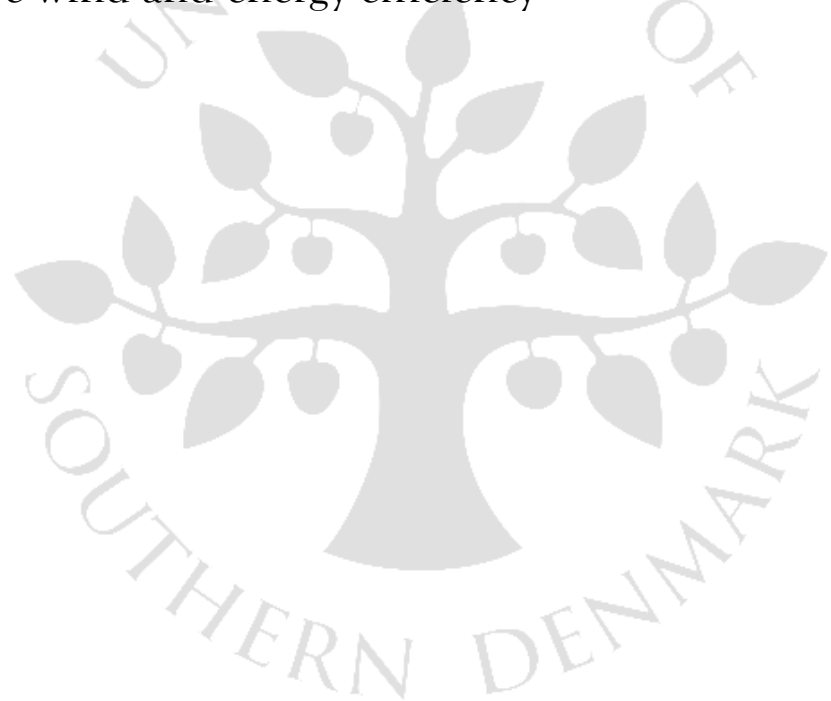




# Foreign Direct Investment in Energy Projects

Denmark - Colombia

Offshore wind and energy efficiency



# Offshore Wind Park Vesterhav Nord

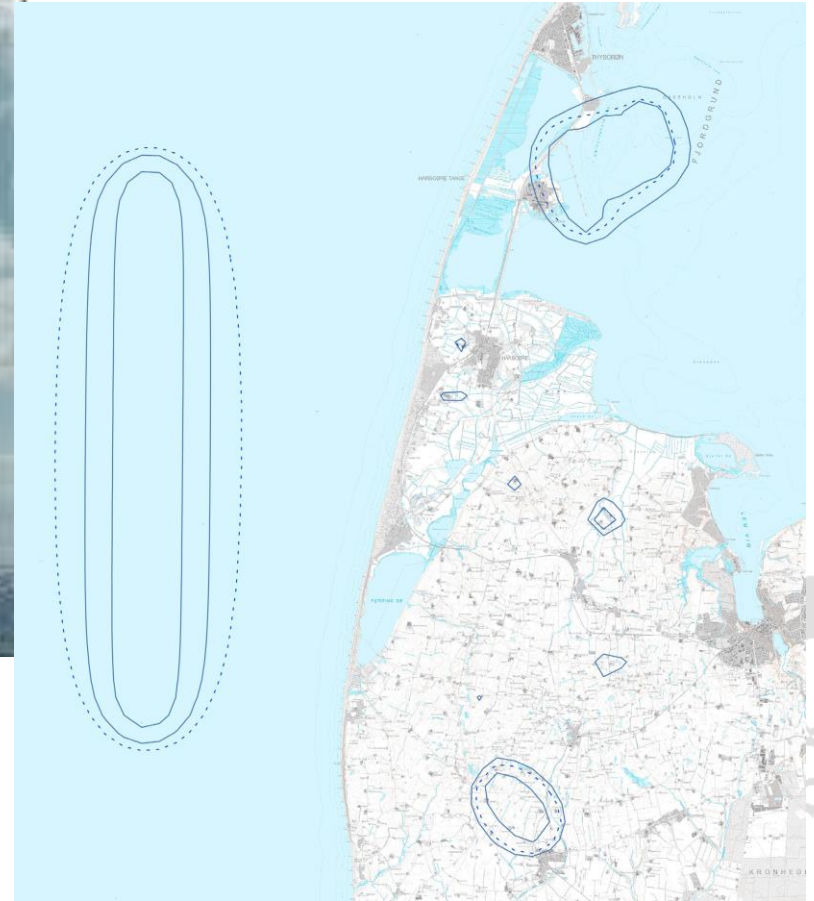


*Near Shore Wind Park*

*21 turbines, 8,4 MW*

*A total of 180 MW*

*Placed at the West Coast of Denmark*



HERN DENMARK

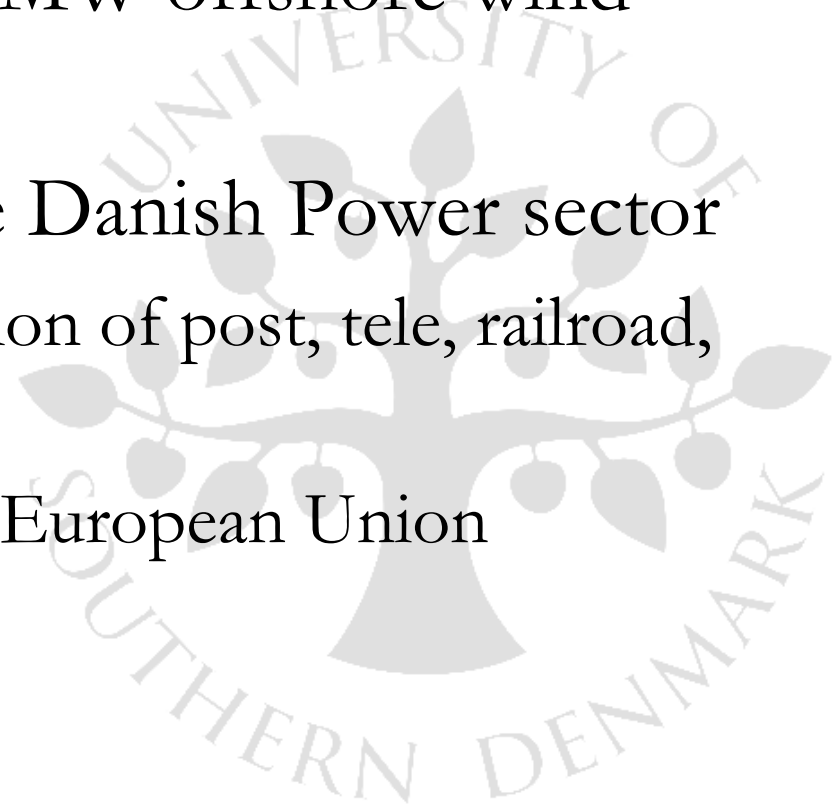
# 30 years anniversary

- Vindeby Offshore Wind Farm
- Erected in 1991 off the coast of the town of Vindeby on the Danish island of Lolland
- Estimated €10 million
- In 25 years, Vindeby had produced a total of 243 GWh
- Decommissioned for cost reasons in 2017

11 turbines	450 kW each
Max. water depth	4 m (13 ft)
Distance from shore	2 km (1 mi)
Hub height	35 m
Rotor diameter	35 m

# Liberalisation

- Vindeby build by monopoly companies
- 1998: Political order to the Danish Power producer to establish 750 MW offshore wind power
- 1999: Liberalisation of the Danish Power sector
  - Part of a general liberalisation of post, tele, railroad, air traffic, natural gas
  - In Denmark driven by the European Union



# Post liberalisation

- With Power Production Companies exposed to competition:
  - New regulation for renewable energy production including offshore wind power
    - Act on Promotion of Renewable Energy (2008)
  - Open Door or a Tendering Procedure
    - The Sea is owned by the State
  - Adding legal tools from onshore wind turbines
    - Co-ownership scheme (being repealed)
    - Compensate neighbours for loss of value to their properties

# Energy Supply Systems

- Critical to any society
- Expressed in energy policies regarding the security of supply
  - the “flow of energy supply to meet demand in a manner and at a price level that does not disrupt the course of the economy in an environmental[ly] sustainable manner” (Chevalier 2006)
- Closely connected with investments made
  - Without timely investments made in different parts of the value chain, the security of supply will be threatened

# Green transition

- If fossil fuels are to be replaced by other energy sources, this will require huge investments in new *production facilities*
- New technical developments, including increased decentralized production from, e.g., solar cells and an increasing number of electric cars, will require future huge investments in the *power grid*
- Quoting the International Energy Agency: “*In advanced economies, electricity demand growth is modest, but the investment requirement is still huge as the generation mix changes and infrastructure is upgraded.*” (IEA 2018)

# Investments

- The need for investment may give rise to lower barrier to these investments
- The wish to attract also foreign investments must be balanced up against the risk that foreign investments can be used to, for instance,
  - extract know-how,
  - commit espionage,
  - abuse natural monopolies,
  - establish control over critical infrastructure or other facilities, making it possible to close down the supply



# FDI and more

- FDI screening
- Licensing requirements
- Tender conditions incl. shortlisting
- Permit requirements
- Unbundling demands
- Order and command (TSO)

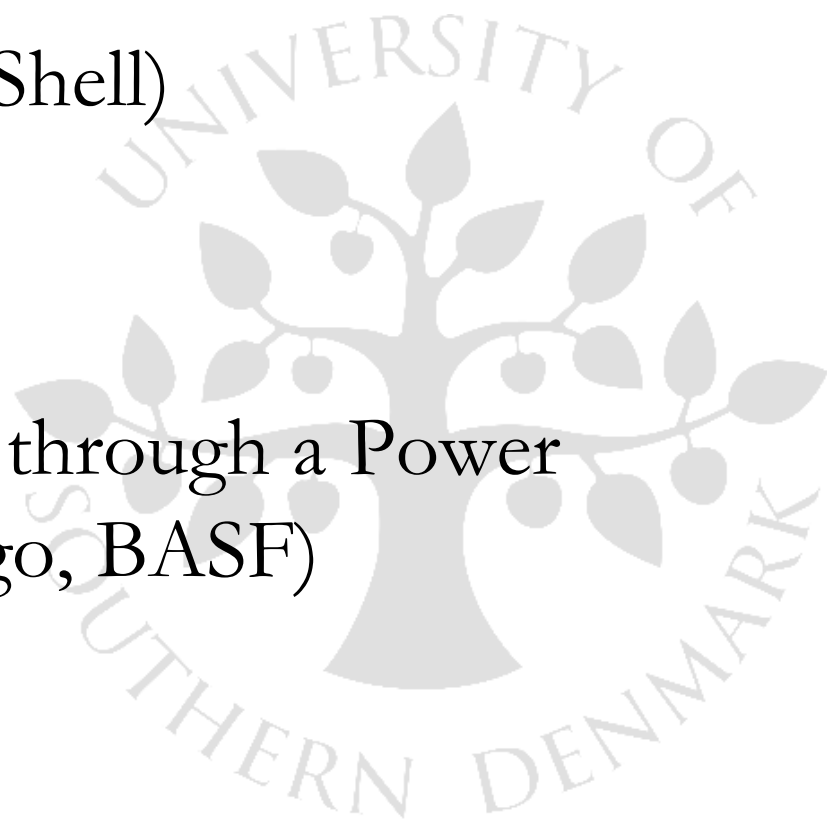


# Investors in present Danish Offshore Wind Parks > 200 MW

- Kriegers Flak, 604 MW (2021) – Vattenfall
- Horns Rev 3, 400 MW (2019) – Vattenfall
- Anholt, 399,6 MW (2013) – Ørsted and pension fund
- Rødsand II, 207 MW (2010) – E.ON
- Horns Rev II, 209,3 MW (2009) – Ørsted

# Future investors in Danish Offshore Wind

- The usual (Ørsted, Vattenfall)
- Other utilities (Iberola)
- Big oil companies (Total, Shell)
- Investment funds
- Pension funds
- Passive investors possibly through a Power Purchase Agreement (Lego, BASF)



# China as an investor

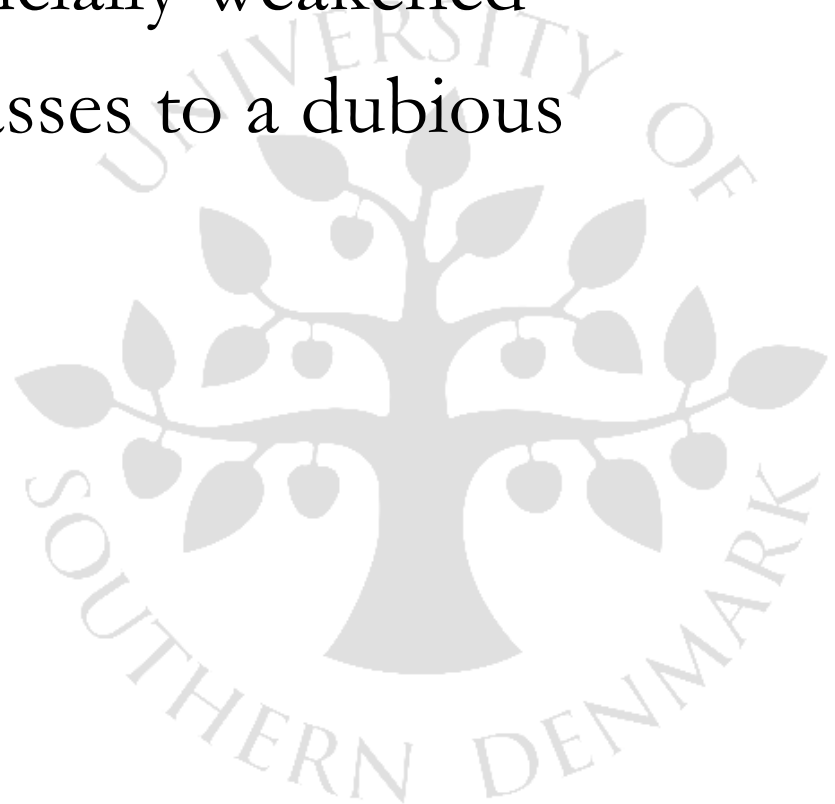
- Chinese SOEs control significant stakes in
  - the Italian power grids, British gas network, and Greece's grid operator.
- China Three Gorges Corp. is holding
  - a 23% stake at the Energias de Portugal SA (EDP)
  - had in April 2019 proposed a hostile takeover of EDP which was rejected at the EDF shareholders' meeting
- 2018, the German government announced to buy a 20% stake in power network company 50Hertz
  - in effect blocking the State Grid Corporation of China (SGCC) from taking a majority stake

# Kill switch if?

- A major part of offshore wind is controlled by one company
  - Swedish Vattenfall may on a windy night control half the Danish power production
- Many wind turbines or parts of them is coming from one country
- Foreign control centers not are meeting cyber security standards
  - Danish authorities have addressed Vattenfall

# And same problems

- if an owner neglects maintenance and new investments
- if an owner becomes financially weakened
- if ownership or control passes to a dubious investor



# Literature

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# Thank you for your attention

**Bent Ole Gram Mortensen**

Professor of Law, LL.M., Ph.D.

University of Southern Denmark

Department of Law

Campusvej 55 – DK-5230 Odense M

Phone +45 6550 2160 (direct), Fax +45 6593 0726

E-mail: [bom@sam.sdu.dk](mailto:bom@sam.sdu.dk)

<http://www.sam.sdu.dk/staff/bom>

<https://orcid.org/0000-0001-6295-166X>