

The cooperative approach in Danish Wind energy ownership before and after the 2008 RE-law

by

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Background H C Soerensen



Business and university background

- PhD, 40 years with business development

Project management large projects

- Ocean wave energy (Wave Dragon), Tidal current (Tideng)
- Offshore wind (Middelgrunden 40 MW, Samsø 23 MW, Hvidovre 7.2 MW)

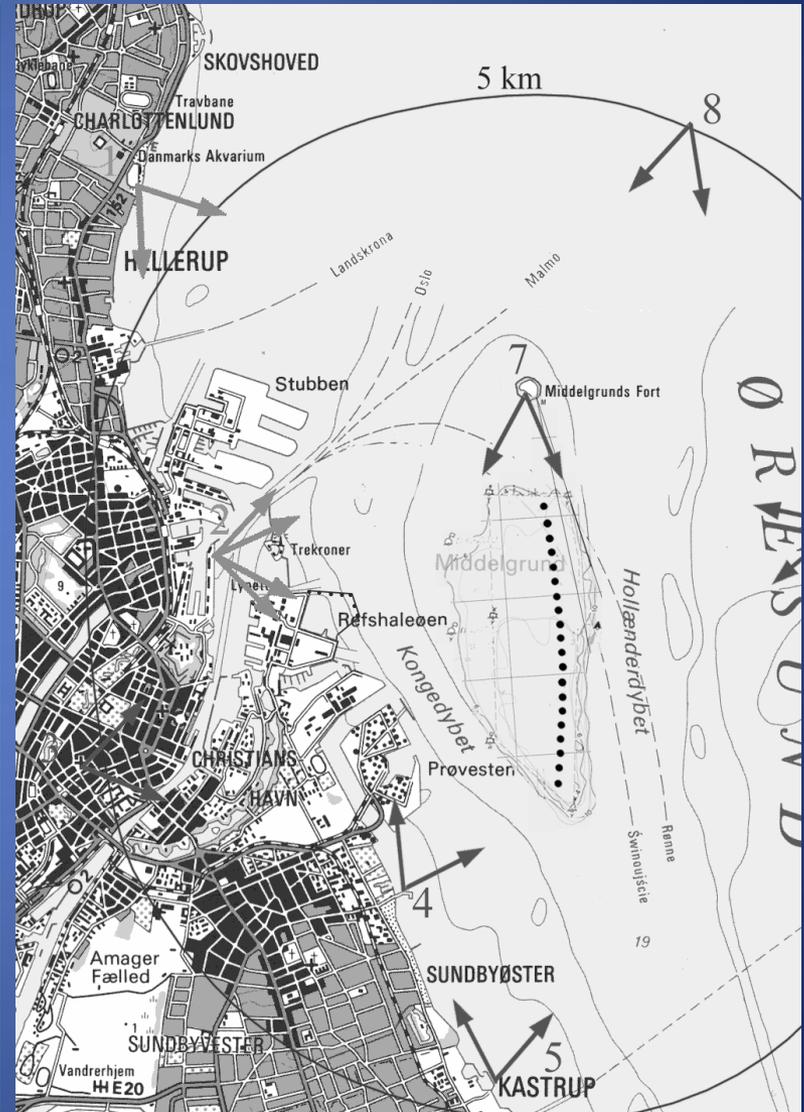
Committees

- Danish Wind Turbine Owners Association, board
- European Ocean Energy Association, vice president to 2011

Lynetten wind farm 7 @ 600 kW in 1996



Middelgrunden 40 MW Wind Farm in 2000



Hvidovre 2009/2011



Hvidovre / Avedøre
3 @ 3.6MW



Prøvestenen 2013



Prøvestenen 3 @ 2.0MW



The changes from the 1990-ies to 2014

Not necessary as result of the 2008-RE law

- The planning law 1992
- Growth in size of wind turbines around 1996-2000
- Design studies of how turbines fit into the landscape;
Frode Birk Nielsen 1996, 2008
- Farmers profit on the world market around 1995-1996

Data the Copenhagen COOP projects



	Lynetten	Middelgrunden	Hvidovre	Prøvestenen
Year	1995/96	1996/2000	2007/2009/ 2011	2013
Power	7 x 600kW	20 x 2MW	3 x 3.6MW	3x2MW
COOP/Utility	4/3	10/10	1/2	1/2
Shares/owners	3,600/902	40,500/8,553	10,700/2,268	4,055/1,800+
Price/share	604€	570€	670€	663€
Upfront work	Coop/Utility	Coop & Utility	Coop & Utility	Utility/Coop
Upfront payment	Coop/Utility	Grant/Utility	Utility	Utility
Cost	4.1 mill€	49.5 mill€	22 mill€	8,07 mill€

Decreased actions at COOP level from 1995 to 2013

The changes from the 1990-ies to 2014

The planning law 1992

- Developers and farmers can now easily find the preferred/designated sites
- Developers are acting fast and offer money for having preference to a potential site. COOP's don't have that opportunity

The changes from the 1990-ies to 2014

Growth in size of wind turbines around 1996-2000

- Wind projects changed to be big business
- Wind projects were bankable
- EIA needed sometime seven for one turbine

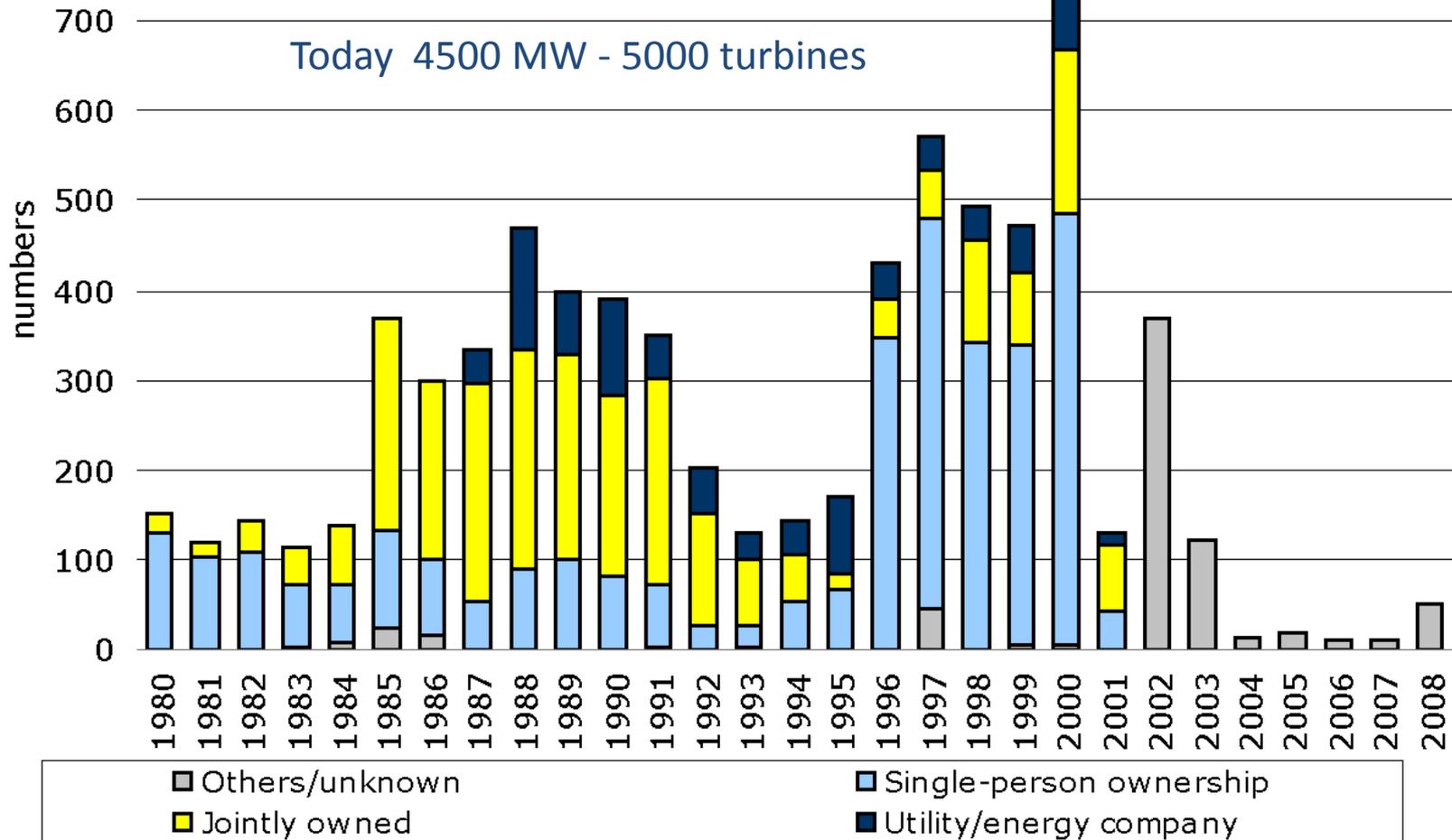
The changes from the 1990-ies to 2014

Design studies of how turbines fit into the landscape; Frode Birk Nielsen 1996, 2008

- Preferred design 3-6 turbines together
- Consequence: EIA needed

Result: More difficult for NGO groups as large up front investment without security was needed

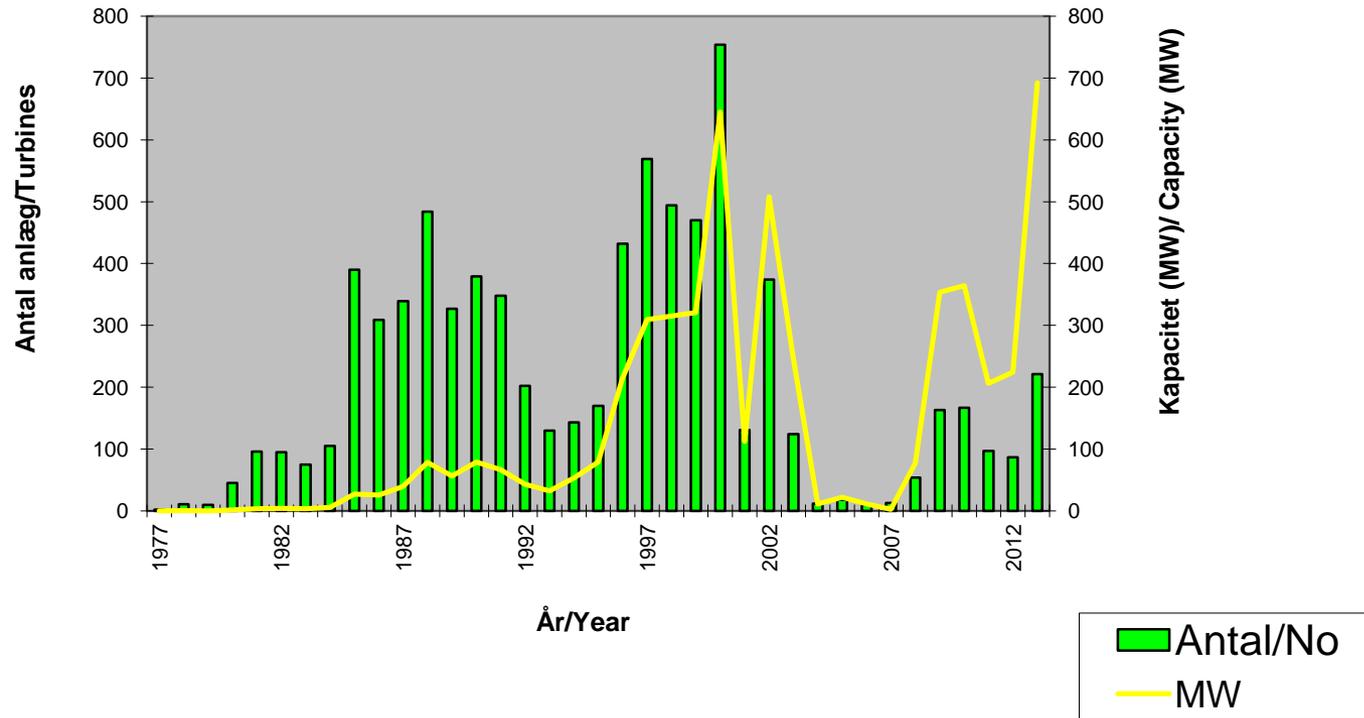
The development up to 2008





Annual growth of wind in Denmark

Årlig tilvækst i anlæg og kapacitet/
Annual growth in number of turbines and capacity Denmark



Danish Cooperative model

- Shared ownership, one person one vote independent of shares
- Typically no loans – up front payment of total cost *
- One share equal to a production of 1,000 kWh/y
- Historically: ownership equal to own consumption of electricity
- Typically 3-5 shares => 3,000 – 5,000 kWh/y up to 2008
 - * Typically 350€ to 670€ a share
 - * A few banks are giving loans for individuals with security in revenue only

Simple tax rules possible – and needed:

- No tax when production revenue less than 940€/y
- Simple tax revenue form
- Only an advantage with less than about 10-20 shares**

** Else use standard for companies: profit less depreciation, but then remember auditor for the tax authorities



The general conditions for wind farms

- 50% of electricity consumption by 2020 – 2013: 34% (40%)
- Power produced to be bought by Transmission System Operator (TSO) - standard PPA
- Price - premium tariff on top of market price¹:
 - First (22,000 hours x rated power): +33.6€/MWh
 - Wind producer to pay cost for balancing, but compensation paid with 3.1 €/MWh
- Offshore farms within Action Plan: tender procedure

¹ market price mean value 2009: 50€/MWh - 2011: 43€/MWh - 2012 32€/MWh but varies and can even be negative

The RE-law of 2008

- Minimum 20% local ownership to be offered citizens within 4.5km, thereafter to local municipality; at cost price; if not sufficient buyers you can as developer keep it by yourselves.
- Loan guaranty after basic work have been done of up to 67,200€ for each project
- Social Green Fund to Municipality
11,800€/MW
- Compensation for neighbours possible; typically 1-1.5 km from turbines



Lesson learned 20% ownership

- 8 projects: 100% of share offered sold
- 4 project 30 - 60%
- 3 projects 1-2%

- Some developers are not motivated
- Wind nomads - people changing address for a short period for being qualified for shares

Changes 2013:

- *Maximum 50 shares within 4½ km zone*
- *Objectivity rules in presentation*

The changes from the 1990-ies to 2014

Conclusions:

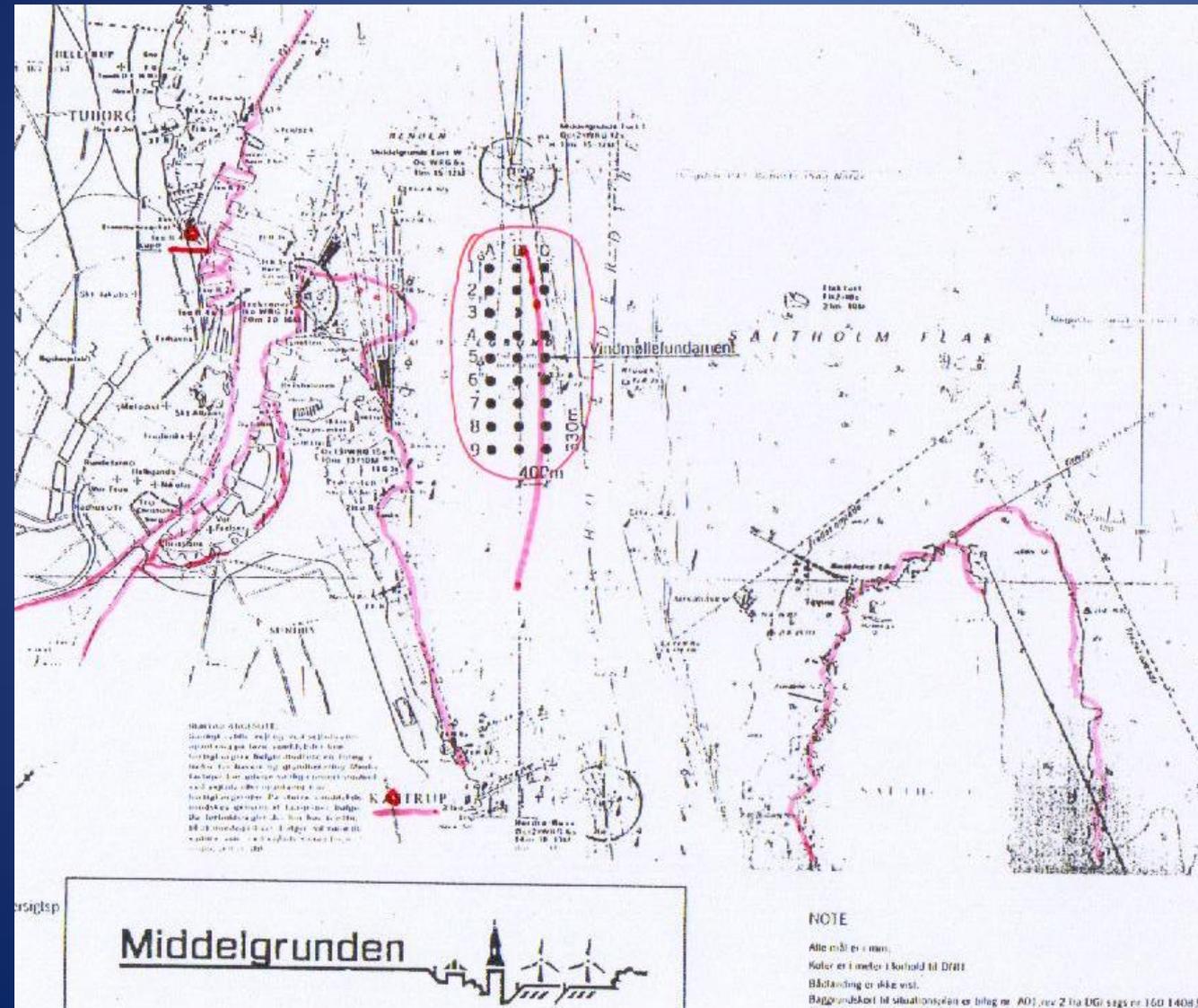
Not necessary as result of the 2008-RE law

- Original COOP projects more seldom
- 20% projects taking over from the original COOP process (50-100%)
- Communication from developers side extremely important for public acceptance at an early stage

An example of communication strategy

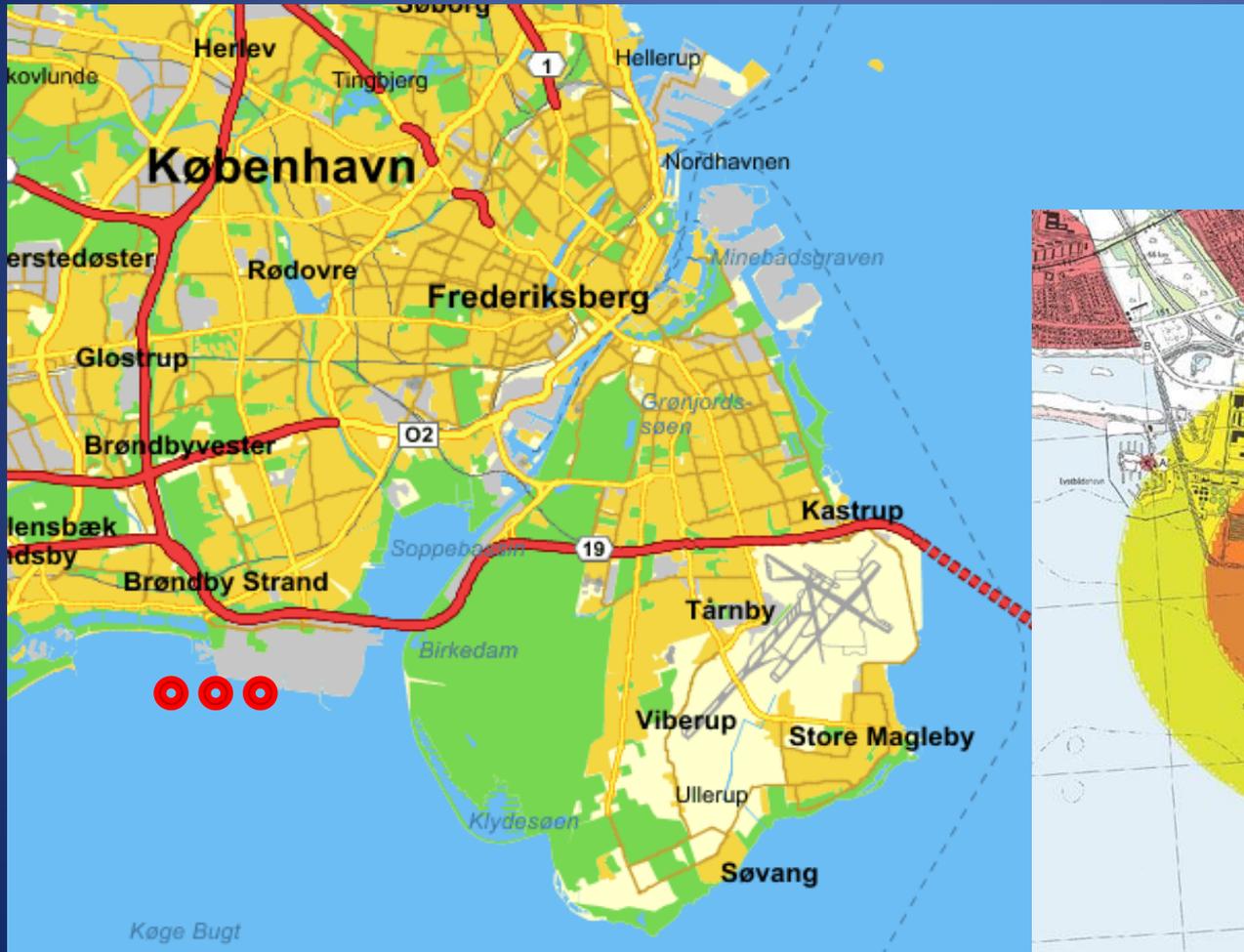
Middelgrundten 40 MW

3 rows in the north part, 27 turbines –
changed to one line over the whole length

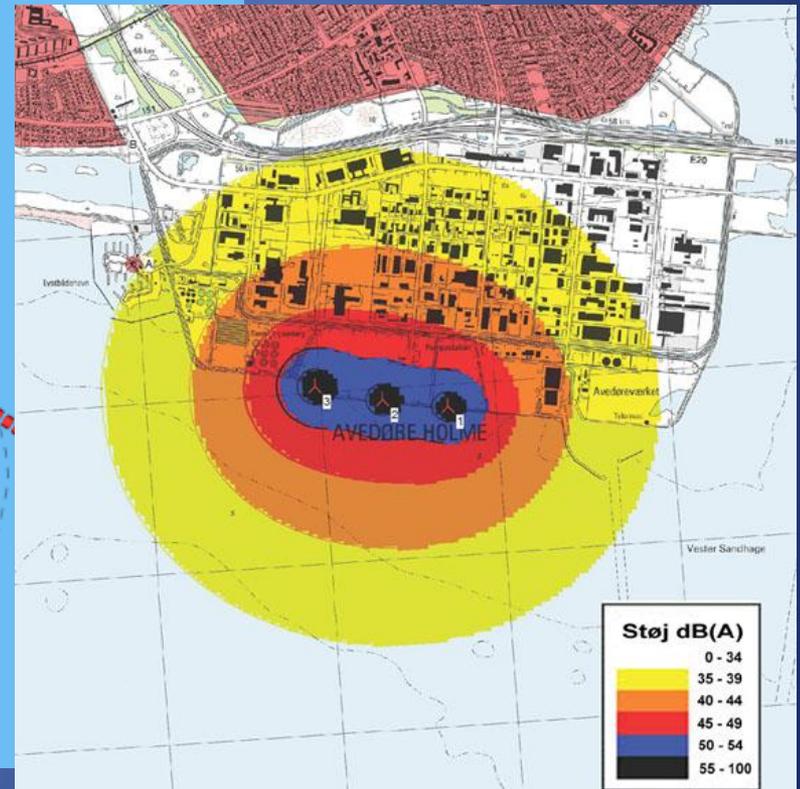




An example of communication strategy Hvidovre/Avedøre



Noise level from
Turbines and
Highway





An example of communication strategy Kalvebod/Prøvestenen



Developer HOFOR

- Two different project managers
- Two different approaches

Prøvestenen

- Early establishment of COOP
- Kalvebod
- No COOP established yet

Result

- Prøvestenen in operation
- Kalvebod still discussed

An example of communication strategy

Koster vind





References



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- MSC THESIS: MANAGEMENT OF UNCERTAINTY AND AMBIGUITY IN WIND POWER PROJECTS
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- Danish Energy Authority (2007): Future Offshore Wind Power Sites – 2025, (“Action plan for offshore wind”), UK Summary 11 pp

The cooperative approach – how to start?

In old days:

- Village got together; meeting called for; landowner also partner; discussion site;
- Planning process started then automatically;

Copenhagen (Middelgrunden):

- A small group from Lynetten wind farm started in 1996 called for interest to work and send application
- At the same time DONG Energy had started own search for setting up a wind farm at the reef
- We agreed to form a common group: *the NGO and DONG Energy to build and later split in two separate operational units each 20 MW and 10 turbines*

The cooperative approach- Benefits

Advantages

- Local involvement
- Earlier involvement
- Profit stays locally

Disadvantages:

- Upfront payment even before consents
- Dependency of manufacturers when no grants

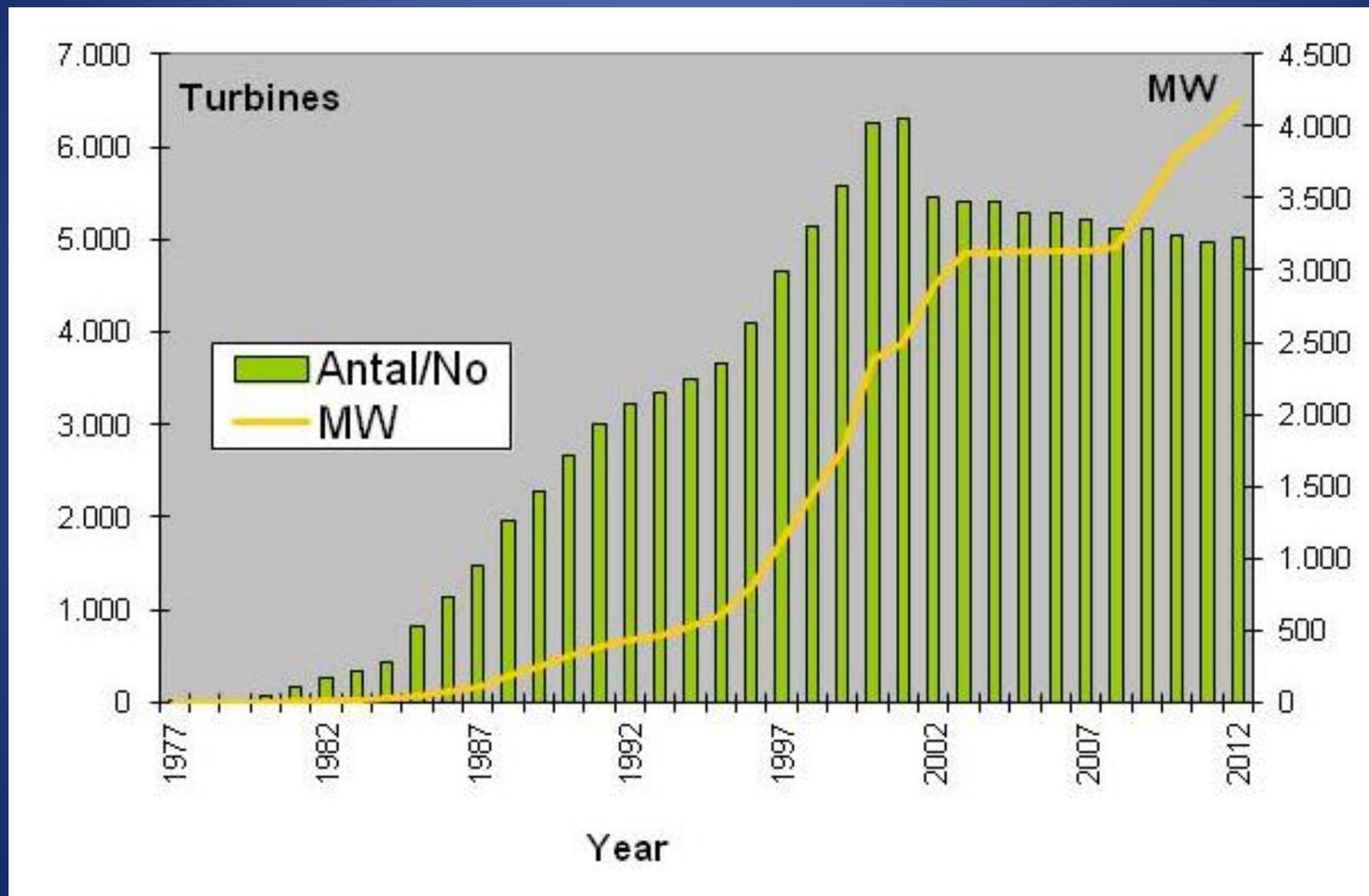
Today (from 2009 onshore):

- Minimum 20% local ownership to be offered within 4.5km, thereafter to local county
- Offshore on close to shore farms: 16 km special incentives

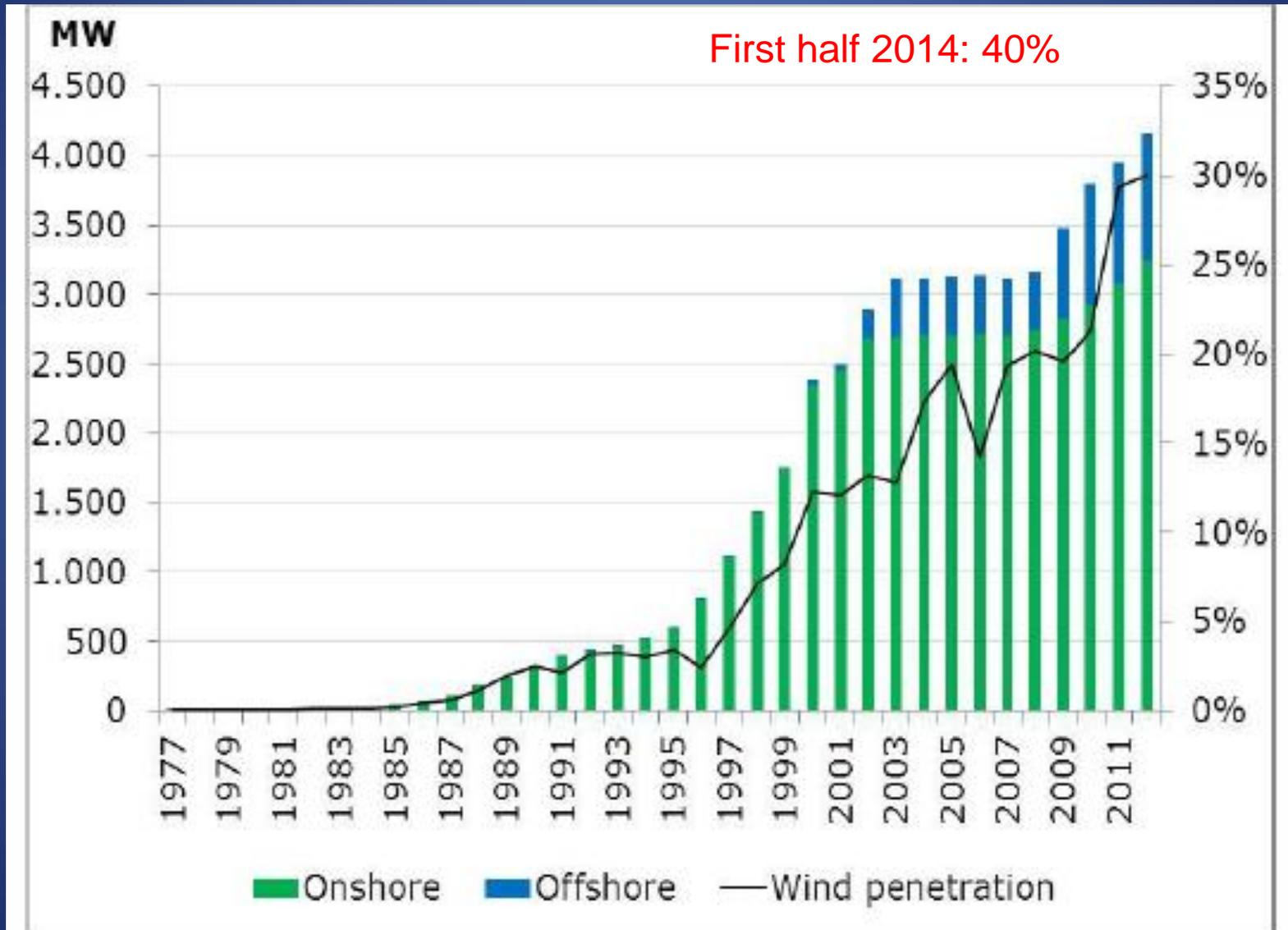
The organisation

- Board of 5-7 people selected every 2 years
- No fee to board members
 - Administration office/book keeping /volunteers dependant of shares
 - One part time person paid to follow up on maintenance
 - Service company or manufacturer to do service
 - Audit company for account
- Home page for information; e-mail if possible
- Newsletter with call for General Assembly each year
- Open house for visiting if possible

Growth in wind energy Denmark

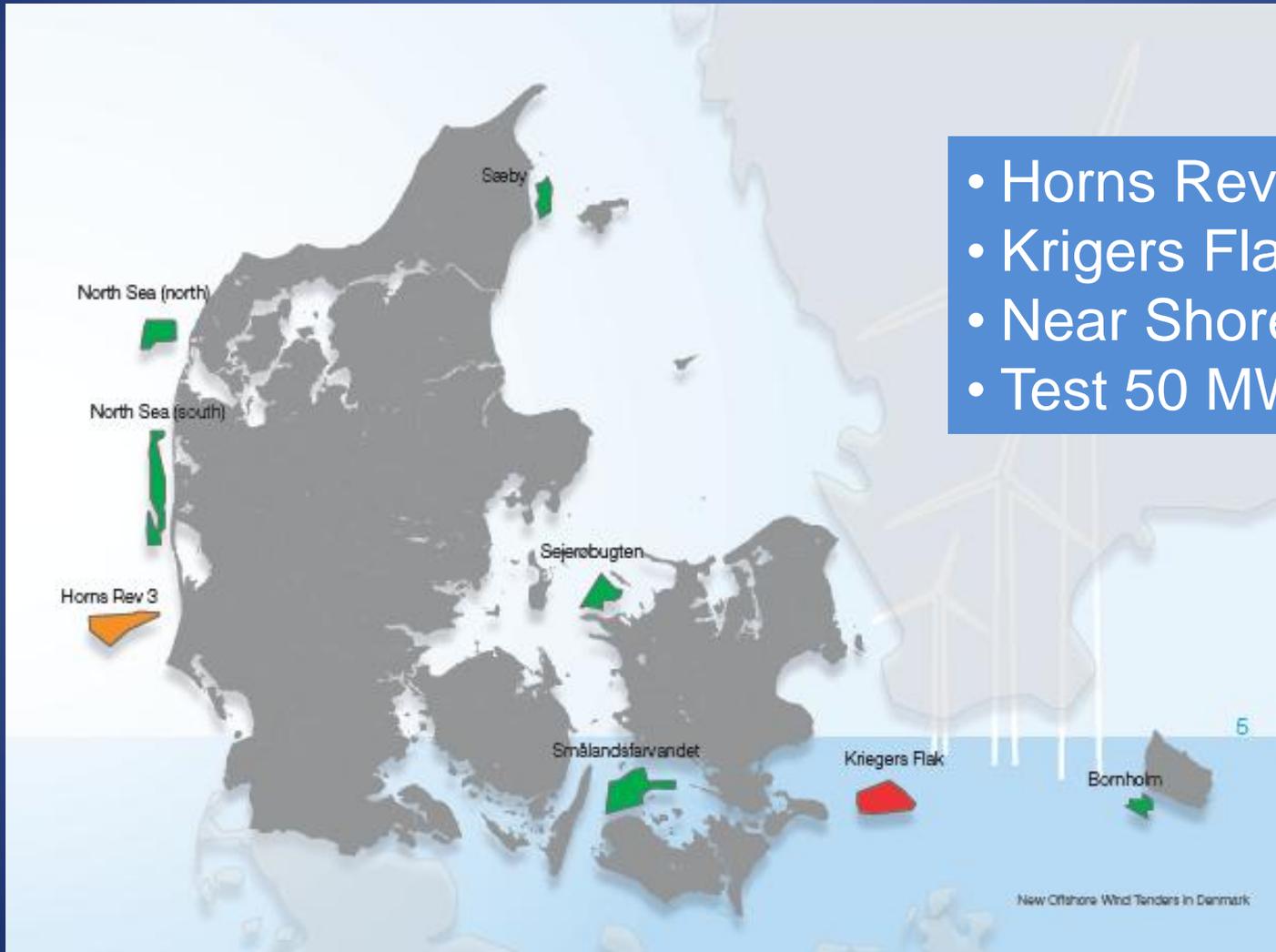


Offshore - onshore

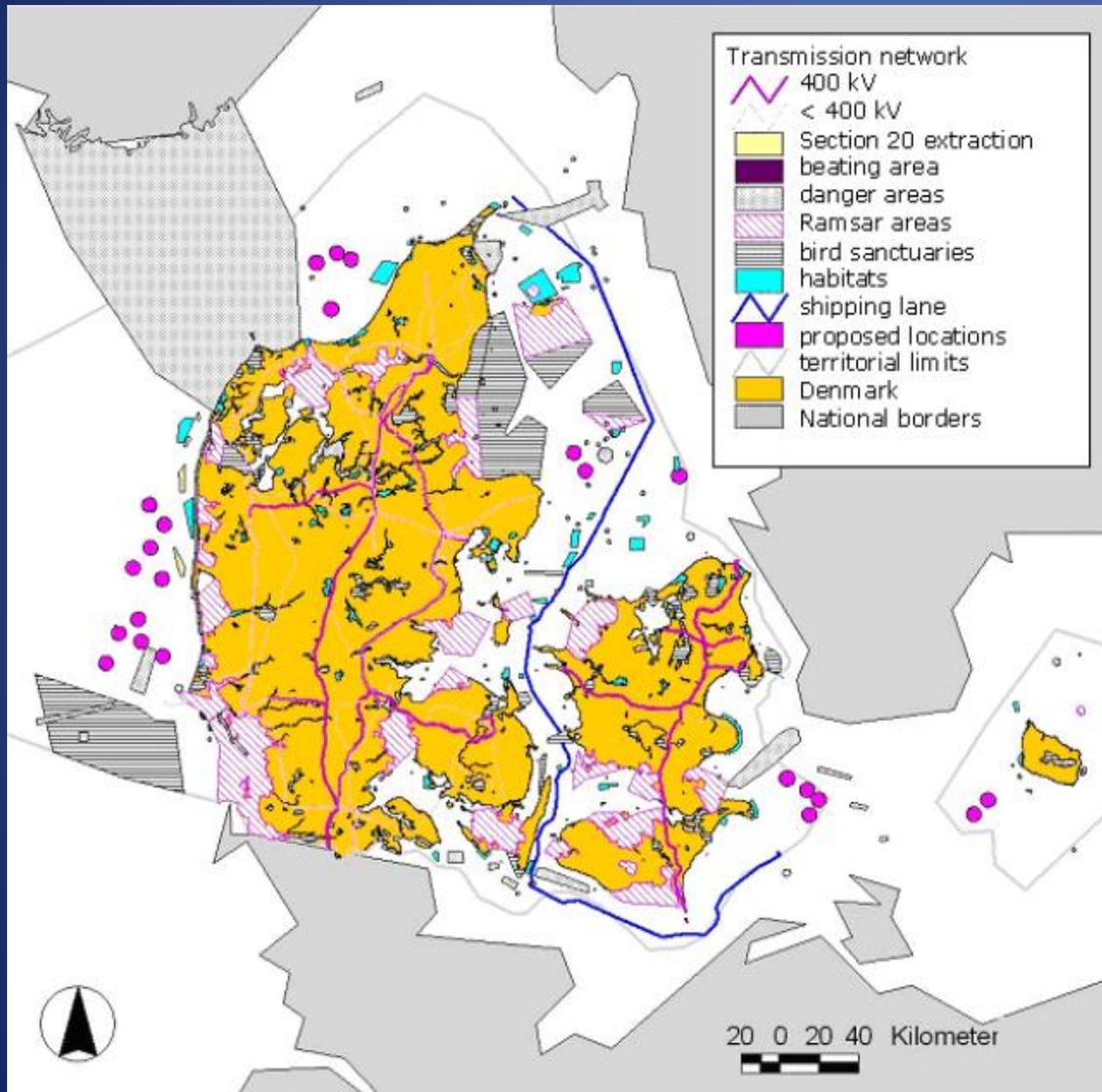




Offshore wind DK 2013-2022

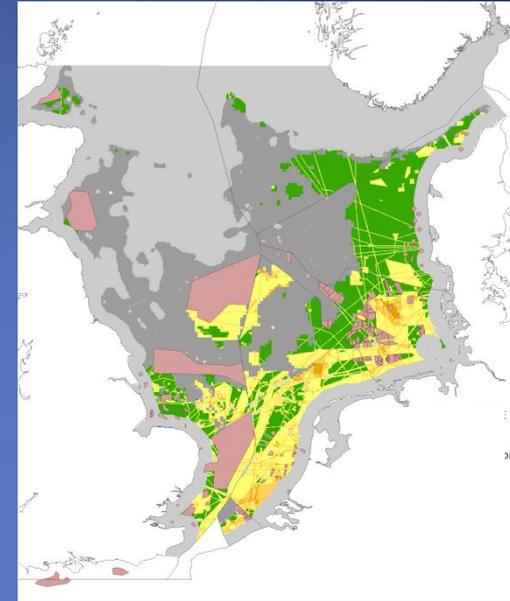
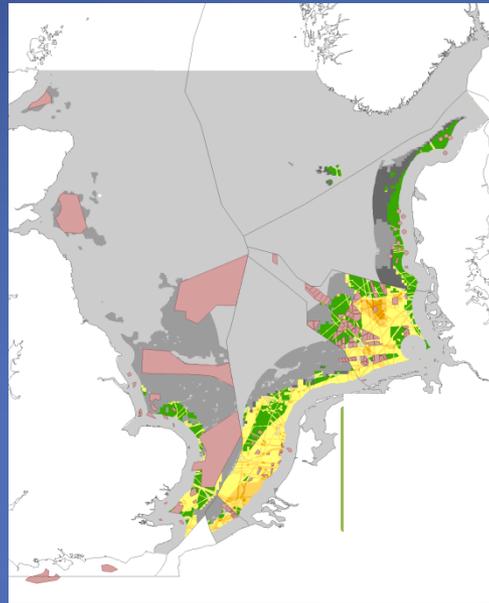


Offshore action plan



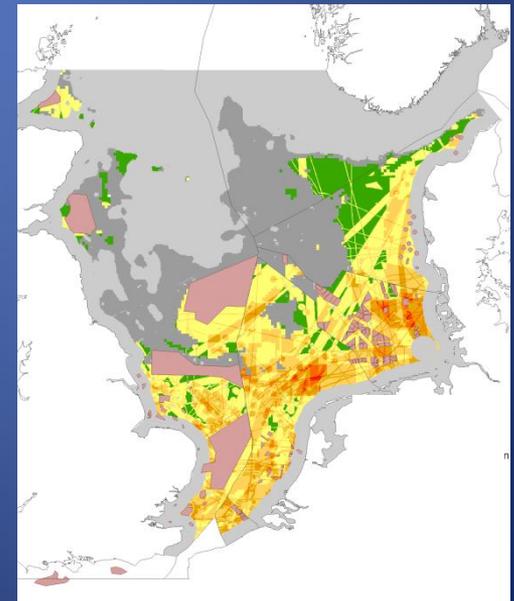
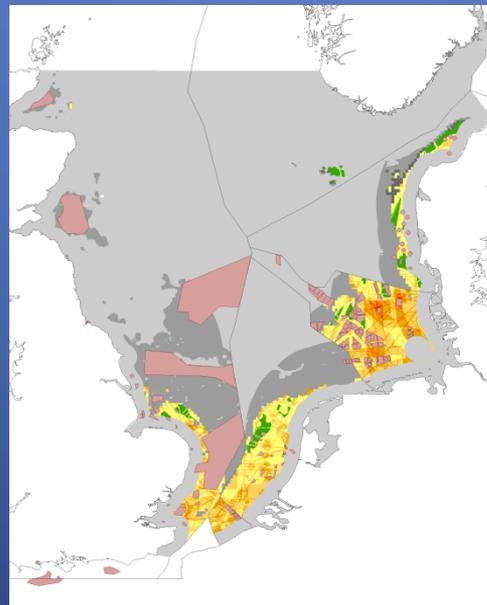
- Minimum 400MW
- Typically >20 km from shore
- Subjected to tender based on lowest price for first 50,000 full load hours
- Else market price
- Only coop involvement close to shore

Economic Potential North Sea trans-national



4 scenarios
WindSpeed
project

Map of economic potential
in the WINDSPEED area for
each scenario: Little Will
Little Wind [bottom left],
Going Solo [top left], In the
Deep [bottom right] and
Grand Design [top right]



Free market for electricity

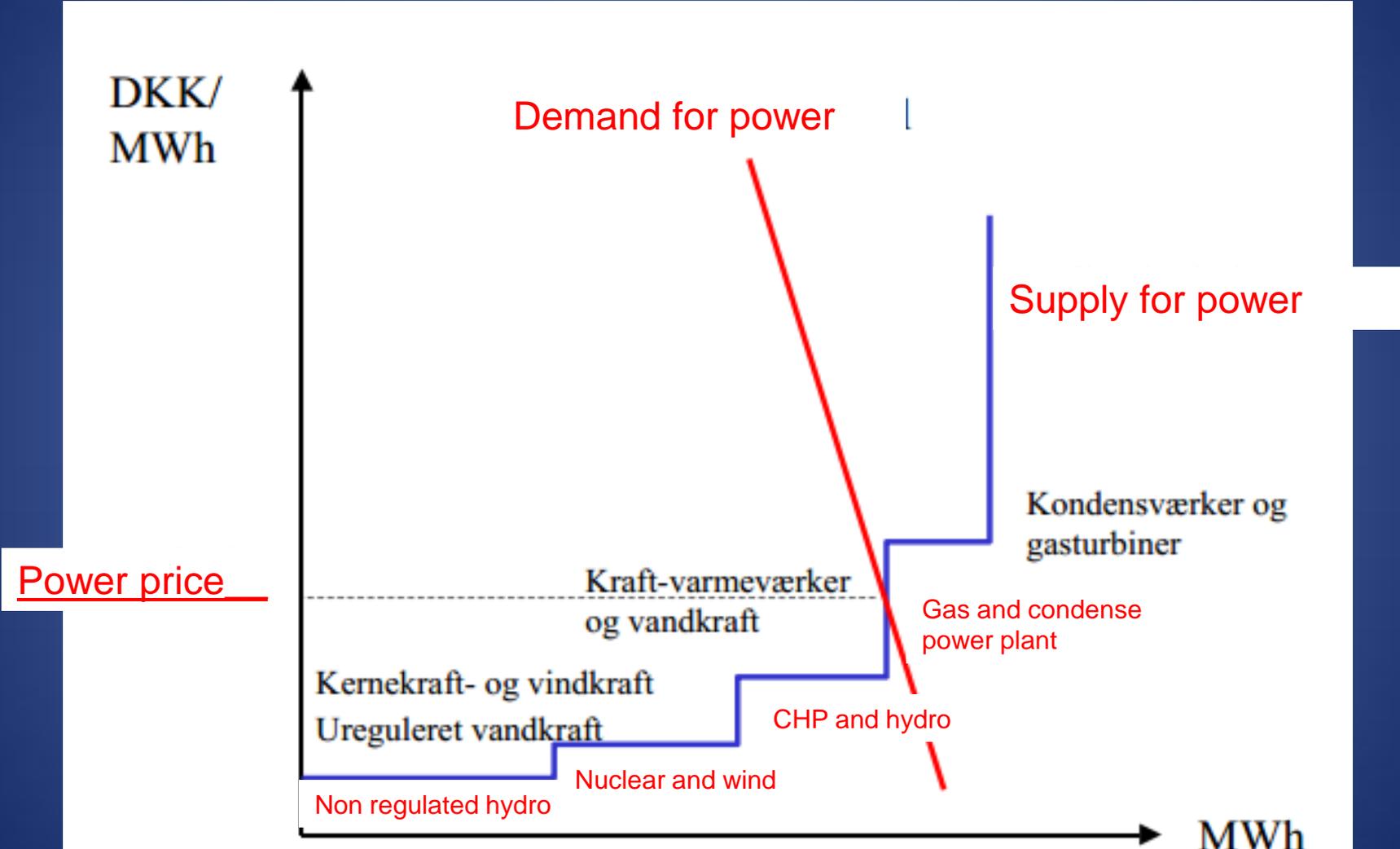
<http://www.nordpoolspot.com/>



Figure 7 : Bid/Offer from one player for the hour 1pm - 2pm of tomorrow.

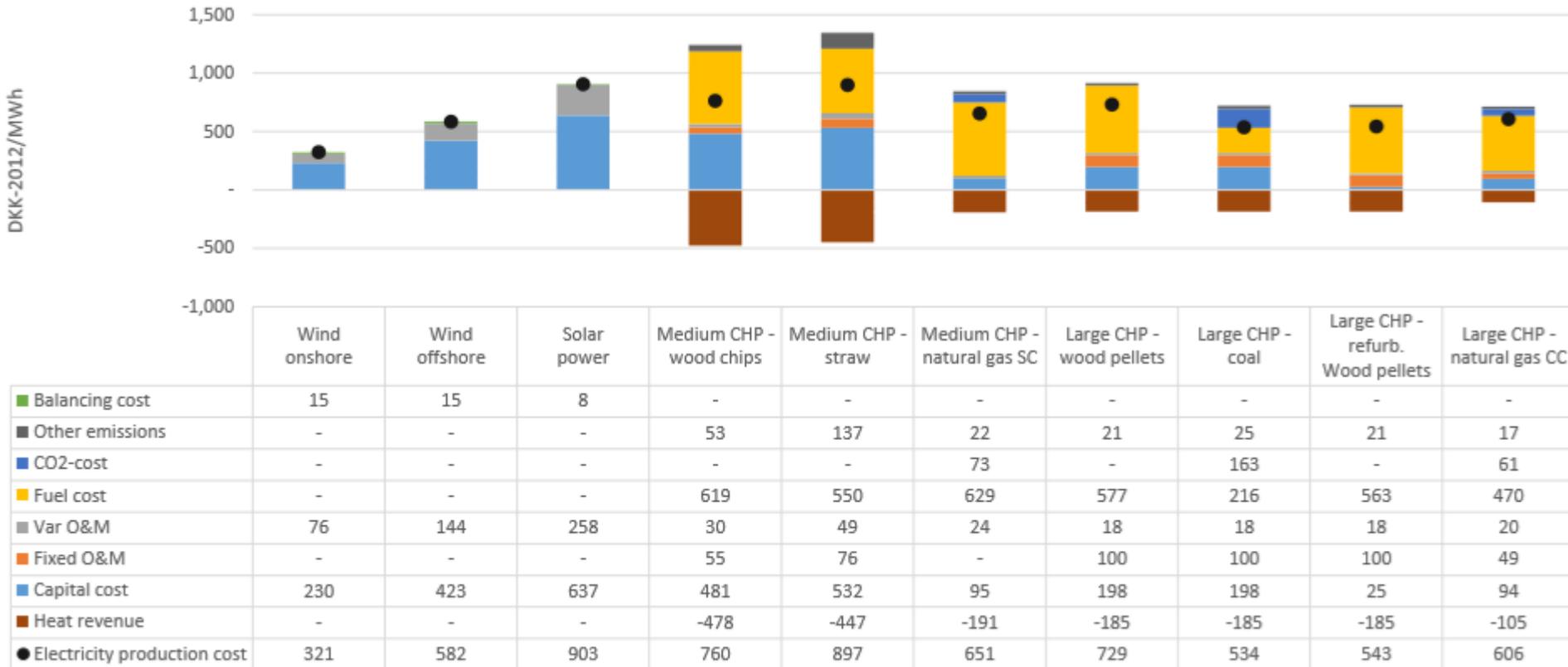


Price on the free market



Source: Poul Erik Morthorst, et.al. *Investering og prisdannelse på et liberaliseret elmarked*: Risø-R-1519(DA)

Price of power in Denmark



2015 prices; source: Ea: Elproduktionsomkostninger ; Samfundsøkonomiske langsigtede marginalomkostninger for udvalgte teknologier April 2014, from www.ens.dk



The Danish public acceptance of wind power

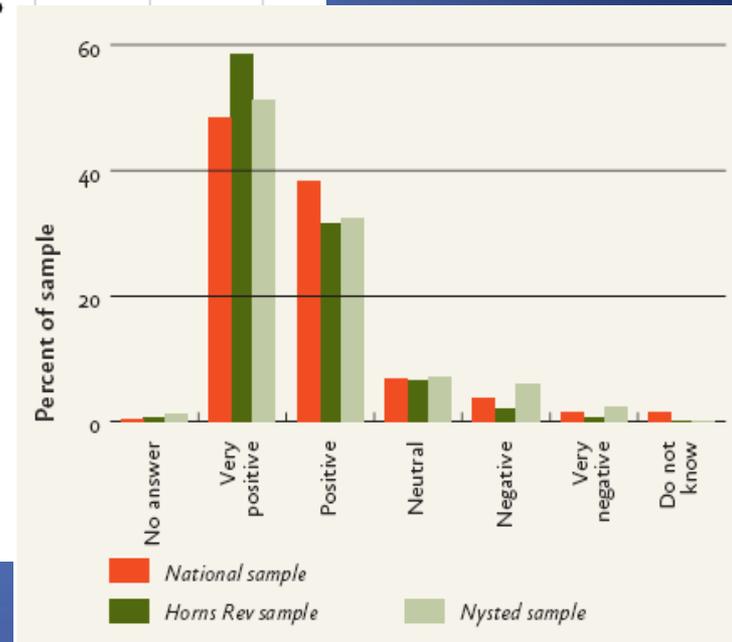
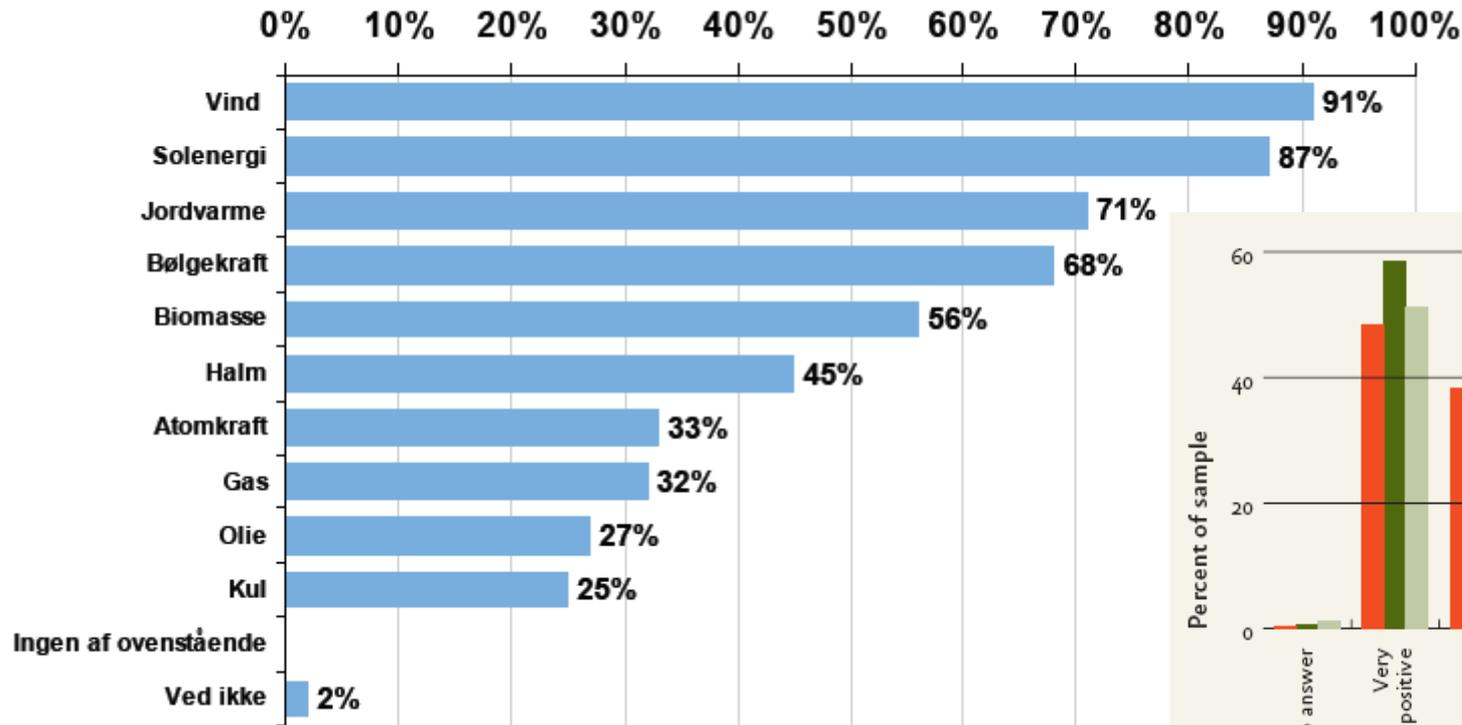


Figure 14: The attitude towards existing wind farms divided onto each of the three samples

More than 90% support:
more wind and has it as #1 source