Cooperative ownership of Danish Wind Turbines

By Hans Chr. Sørensen, PhD

Role: NGO

- Lynetten wind farm, 3,600 shares, 4*600kW
- Middelgrunden wind farm, 40,500 shares, 10*2MW
- Hvidovre wind farm, 10,700 shares, 3.6MW

- Board member Danish Wind Turbine Owners Association
- Vice President, European Ocean Energy Association, BRU
- Chairman marine sector, GHG Energy Corporation

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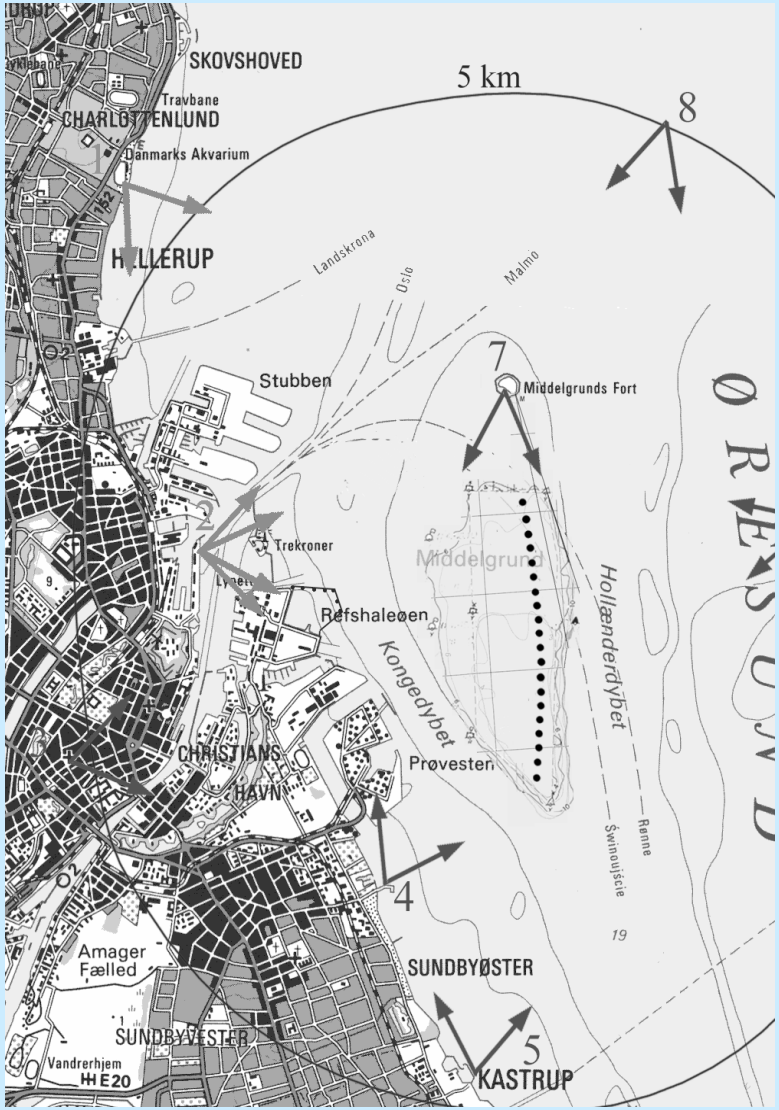
DANMARKS VINDMØLLEFORENING

1996 Lynetten, 2000 Middelgrunden

Lynetten wind farm 7 x 600 kW - 1996

Middelgrunden 2 x 2MW Wind Farm 2000



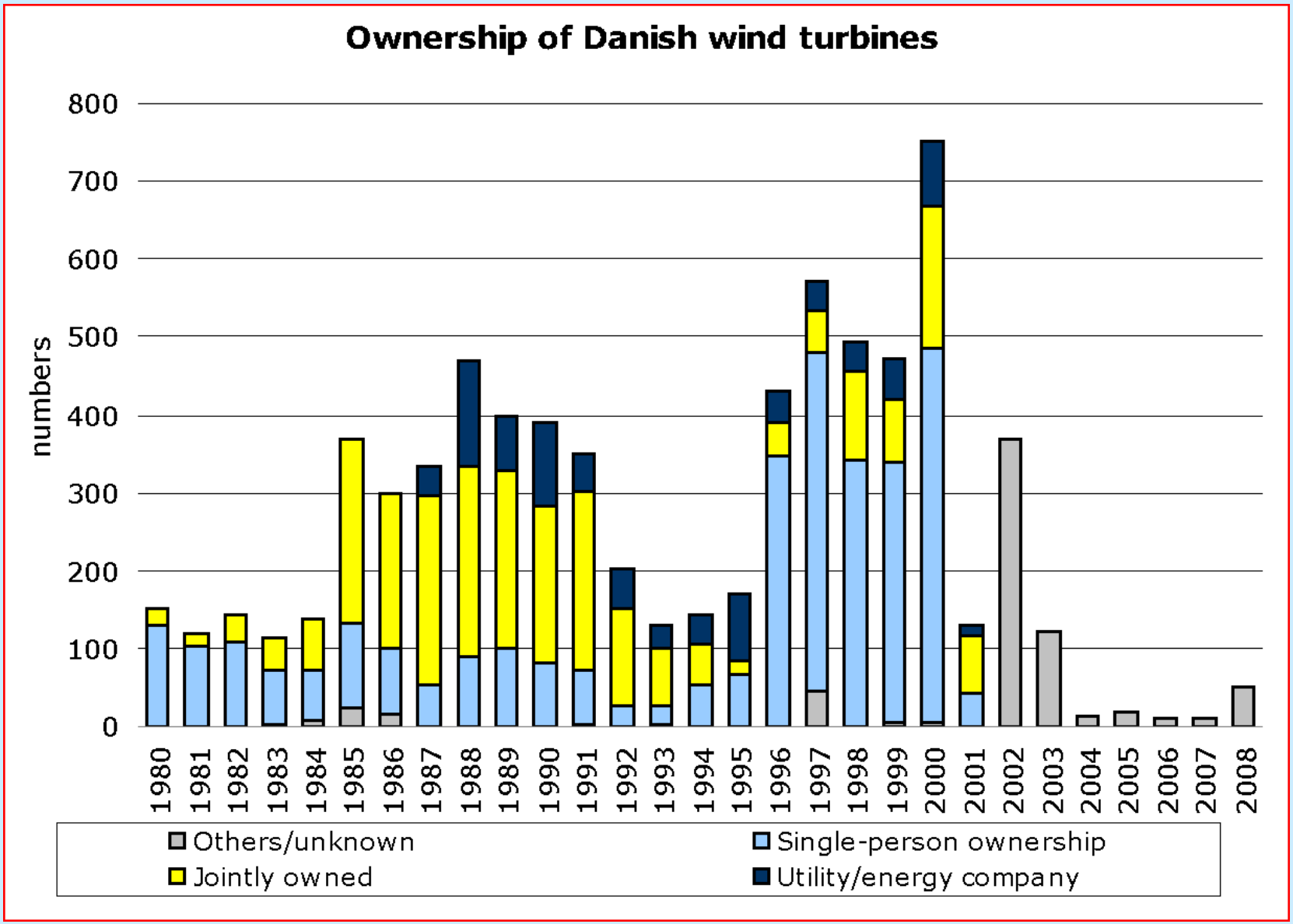
Hvidovre /Avedøre 2 x 3.6MW 2009

Facst about the Cooperatives in Copenhagen

	Lynetten	Middelgrunden	Hvidovre
Year	1995/96	1996/2000	2007/2009
Power	7 x 600kW	20 x 2MW	2 x 3.6MW
Coop/DONG	4/3	10/10	1/1
Shares/owners	3,600 shares/902	40,500/5,853	10,700/2,200
Price/share	604€	570€	670€
Upfront work	Coop/Utility*	Coop & Utility*	Coop & Utility
Upfront payment	Coop/Utility	Grant/Utility	Utility
Cost	4.1m€	49.5 m€	14.7 m€

* Utility at that time owned by Copenhagen Municipality, now DONG Energy

Denmark: 3,000MW wind - 5,000 turbines



Source: www.dkvind.dk

The general conditions for wind farms

- Power produced to be bought by Transmission System Operator (TSO)

- Price (premium tariff on top of market price[1]):
  - First (22,000 hours x rated power)kWh: +0.0336€/kWh
  - Wind producer to pay cost for ballancing, but compensation paid with 0.0031 €/kWh

[1]:market price mean value 2009: 0.05€/kW but varies and can even be negative

The cooperative approach

- 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

Simple tax rules possible – and needed:

- No tax when production revenue* less than 400€/y
- Simple tax revenue form
- Only an advantage with less than about 10 shares**

* not profit –revenue form selling electricity! Limit to be raised to 940€/y

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

The cooperative approach – how to start?

In old days:

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

Hvidovre (and Middelgrunden, Lynetten):

- A small group from Middelgrunden wind farm started in 2006 to contact the county and the landowner AV Miljø
- At the same time DONG Energy had started own search for repowering existing 300kW turbines (originally a cooperative)
- As for Lynetten and Middelgrunden: we agreed in 2007 to form a common group: *the NGO and DONG Energy*
- There was an old agreement from 2001 between DONG Energy and Danish Wind Turbine Owners Association about sharing the ownership for some offshore wind farms

The cooperative approach- Benefit

Advantages

- Local involvement
- Earlier involvement
- Profit stays locally
- Gradually growth and higher acceptance

Disadvantages:

- Upfront payment even before consents
- Dependency of manufacturer/developers when no grants

Today from 2009:

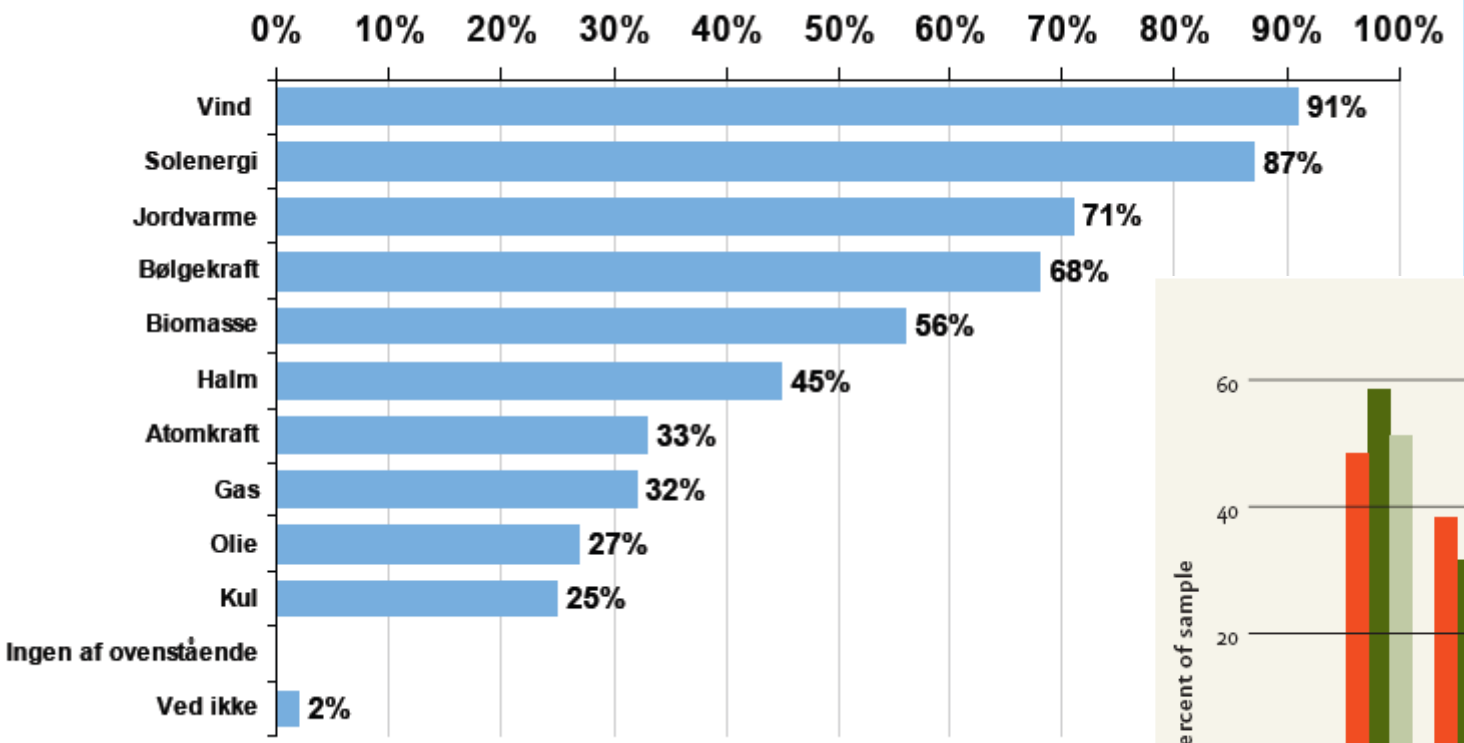
- 20% local ownership to be offered within 4.5km, thereafter local county

The cooperative approach- details

Today :

- 20% local ownership to be offered within 4.5km, thereafter local county; at cost price; if not sufficient buyers you can as developer keep it by yourselves.
- Projects typically 3-6 turbines which is most accepted by people in the Danish landscape
- Usually turbine lower than 100 meter
- Loan guaranty after basic work have been done of up to 67,200€ for each project

The public acceptance of wind power



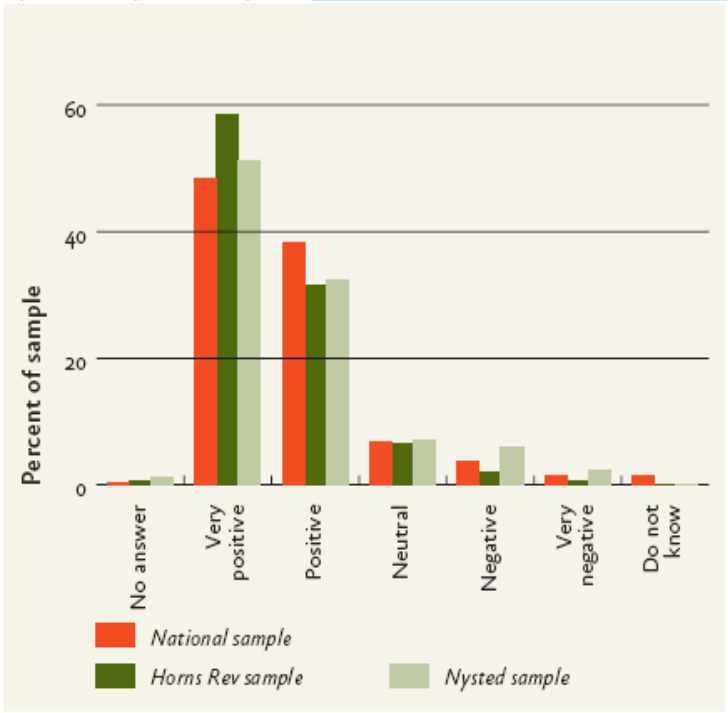


Figure 14: The attitude towards existing wind farms divided onto each of the three samples

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

Sources www.dkvind.dk; www.ens.dk

Key words cooperative

- Openness
- All information on the table
- Agenda 21 action

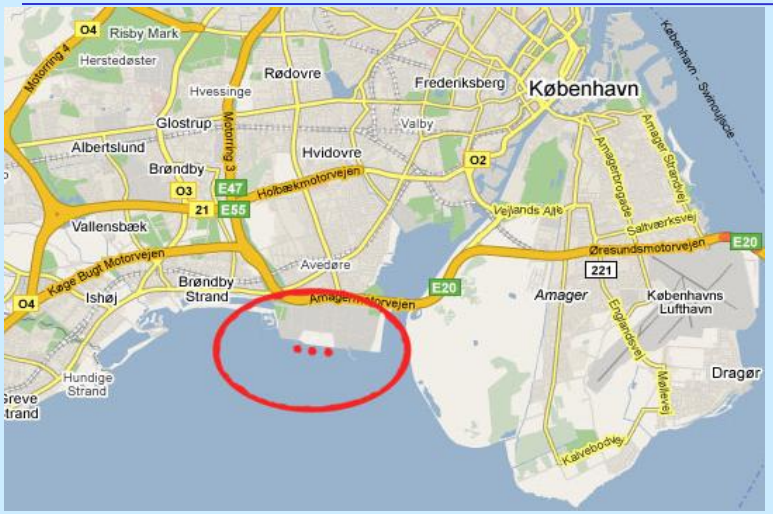
Local ownership results in avoided NIMBY

Middelgrunden
Visual Impact – two alternatives

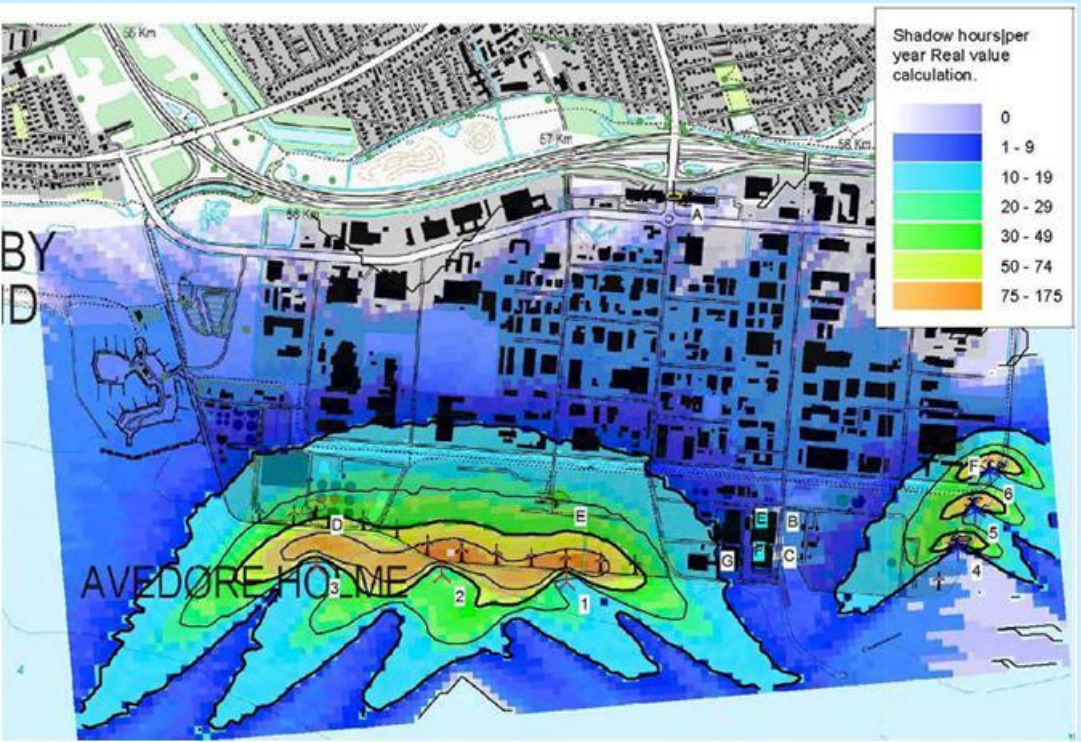
27 turbines in 3 rows

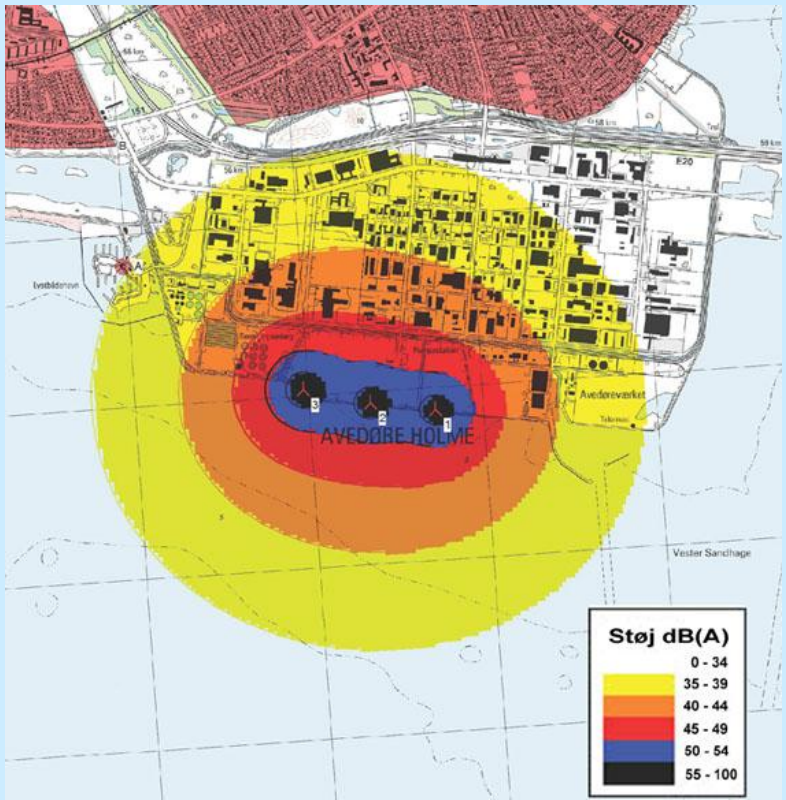
20 turbines in a curved line

Planning process Hvidovre

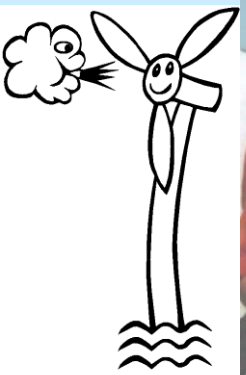


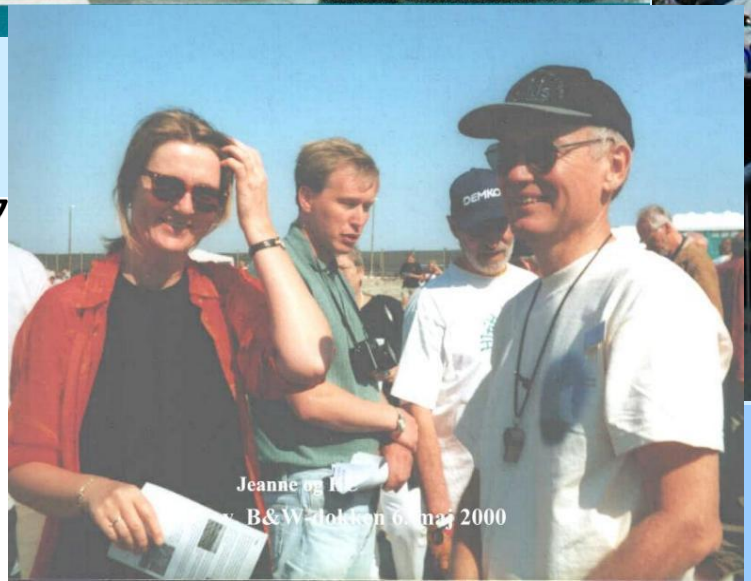
- Spatial planning – onshore/offshore
- Public acceptance
  - Visual impact
  - Noise
  - Shadow
- Feasibility





Action



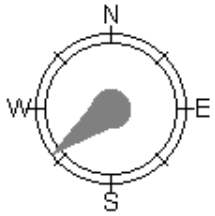


Action: To involve local people in the project

Middelgrunden Wind Farm – the production

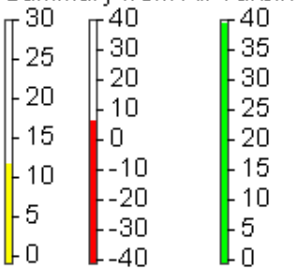
Wind Power Supervisor

Park view, Middelgrunden



233 degrees

Summary from All Turbines



12.2 m/s Meteorology

6.2 °C

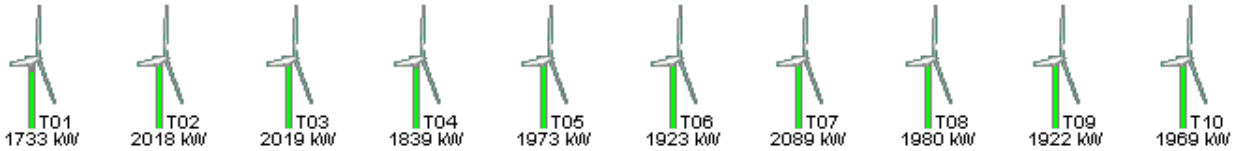
39.1 MW Power

Site Map

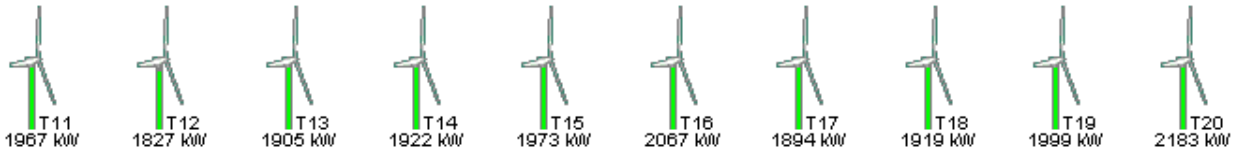
Legend

- Turbine in Service
- Turbine Event
- No communication

Københavns Energi

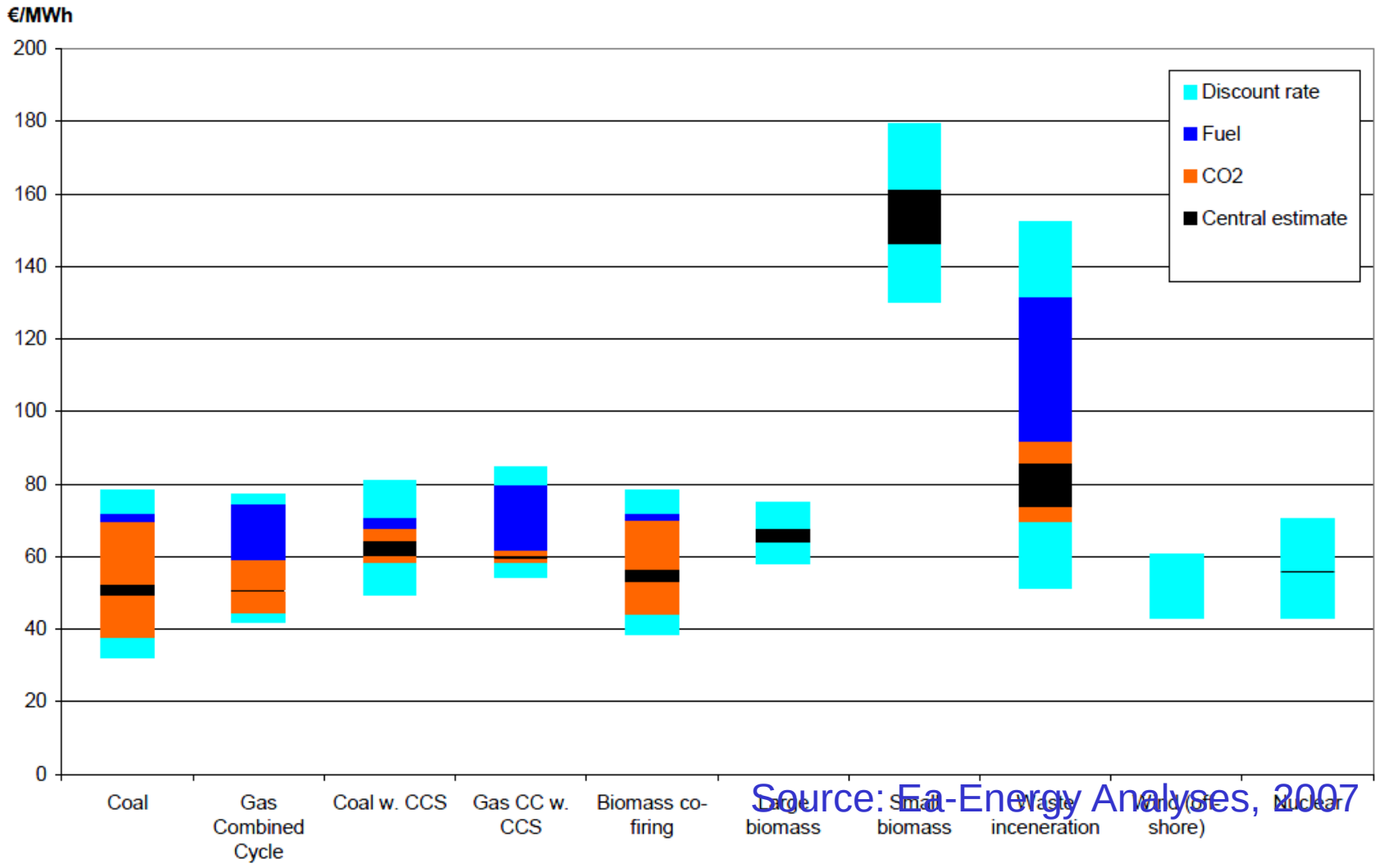


Middelgrundens Vindmøllelaug



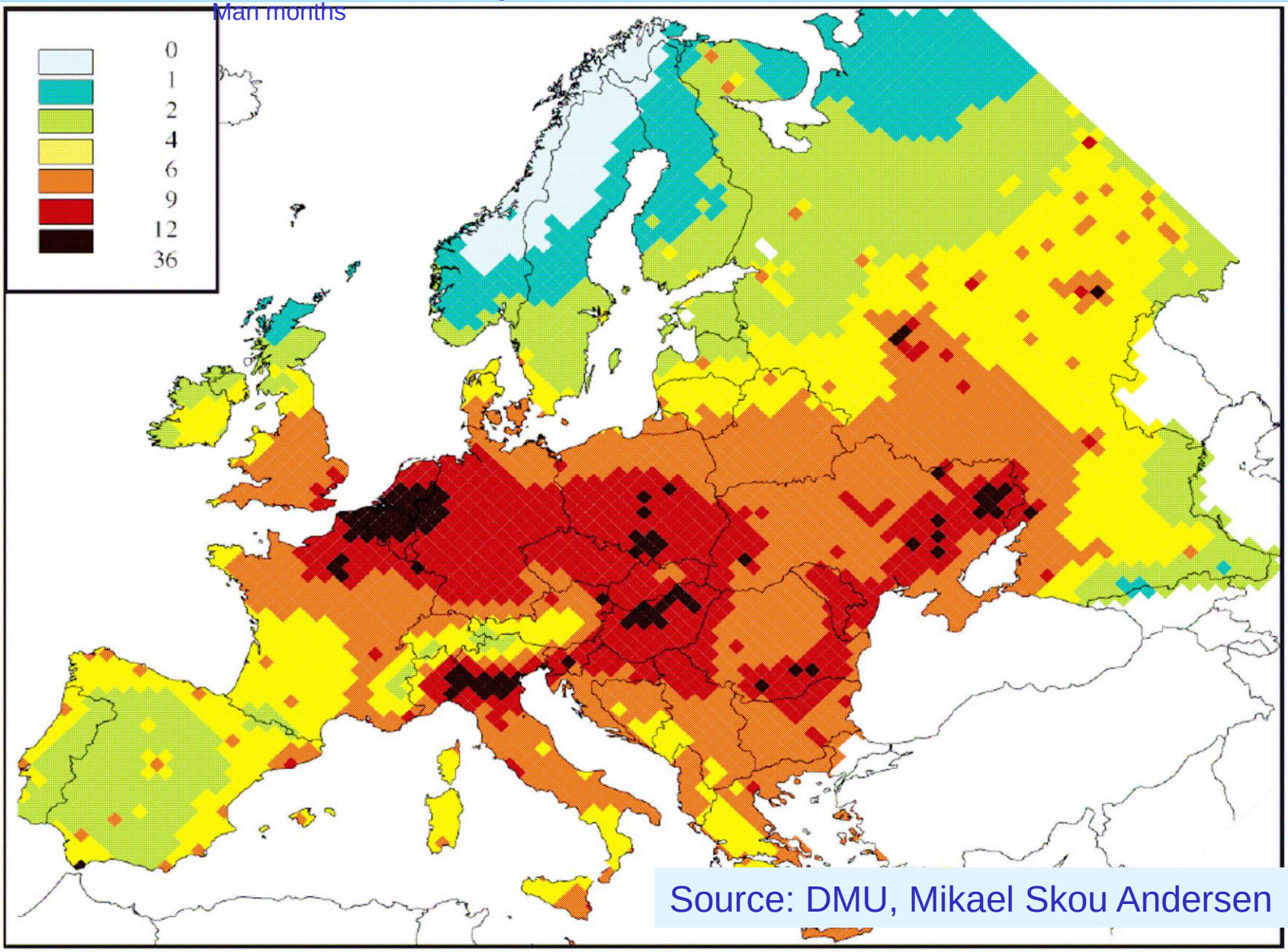
www.middelgrund.com

Cost of producing a kWh – Including Externalities Denmark



Source: Ea-Energy Analyses, 2007

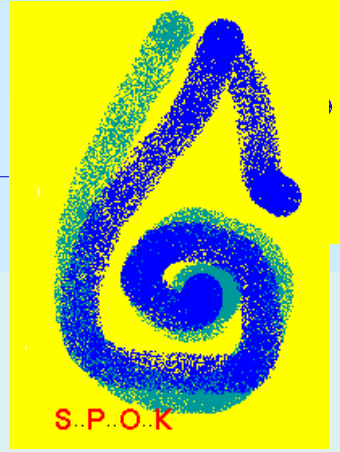
Your live expectation in months less of mean influenced by particle emission



Source: DMU, Mikael Skou Andersen

SPOK ApS

Sustainable Projects - Offshore Know-how



Project management RTD projects

- Ocean wave energy (Wave Dragon)
- Offshore wind (Middelgrunden 40 MW and Samsø 23 MW)

Evaluation

- EU and DEA projects, Biomass RTD
- Building process optimization

Committees

- Danish Energy Agency; Grid integration of RES
- EU Offshore Wind Concerted Action;
- EU Wave Energy Network;
- EU Windspeed; EU Needs project

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