The Cost of Visual Impact
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Vrede naboer om vindmøller: Dem må I længere ud på havet med

Arguments Against:
- Nuclear
- Oil
- Coal

It's in my backyard!
Looking beyond NIMBY

- Nearshore projects are often less expensive
- Onshore wind turbines still have significant cost advantages
- Both onshore and offshore wind turbines experience resistance by the public
- Are these complaints reasonable?
Insights on resistance and cost

• What are the main drivers for resistance/public-acceptance?
  – Most complaints are due to noise
  – But people state that the main disamenity is visual impact
  – Noise complaints are often used as tools because they are more effective at stopping projects

• Are complaints just whimsical?
Measurable Effects on Price

The vindication of Don Quixote
(Jensen et al., 2014)

• Hedonic Pricing study on household transactions in Denmark

• Database of 12,640 house transactions

• GIS high resolution (1.6 x 1.6m) viewshed model of onshore wind turbines.

• 647 sq. Km

FIGURE 1
Map of Denmark Showing the Spatial Distribution of Study Areas
Measurable Effects on Price

The vindication of Don Quixote (Jensen et al.)

• There is a noticeable impact on house prices!

• Wind turbines lower up to 10% of the house price (combined noise and visual disamenities)
Strong preferences for Offshore vs Onshore

The Offshore Onshore Conundrum
(Hevia-Koch et al. 2017)

• Stated preference study regarding offshore wind farms

• Includes GIS for analysis of spatial variables e.g. distance to coast, number of wind turbines in area, distance to proposed project areas

• Significant WTP to site wind turbines **offshore** instead of onshore (*caeteris paribus*)
Strong preferences for Offshore vs Onshore

The Offshore Onshore Conundrum (Hevia-Koch et al. 2017)

• Respondents less sensitive to costs for offshore alternatives

• WTP for moving 150 MW offshore instead of onshore: 612 kr/household per year

• Additional WTP for situating wind turbines further offshore (from 8 km to 12, 18, 50 km)

• Further analysis done: Distance to coast, socioeconomics, experience with wind turbines, and more.
Preference Dynamics

(Ladenburg, Lindegaard & Hevia-Koch, Working Paper)

- How can we address this preferences?
- Is it possible to shape them?

“Build anyways and let people get used to them”
Preference Dynamics

(Ladenburg, Lindegaard & Hevia-Koch, Working Paper)

- Natural experiment considering residents living nearby two wind farms at different visibility conditions (Horns Rev III and Nysted)

- Identical experiment, but differences in sample’s daily experience with wind turbines

- Preferences regarding cost, size and distance of wind turbines
Preference Dynamics
(Ladenburg, Lindegaard & Hevia-Koch, Working Paper)

- Respondents in Nysted:
  - Higher WTP and less cost sensitivity for siting turbines **further away**
- Respondents in Horns Rev III:
  - Higher cost sensitivity, **less preferences** for reducing visual impact

- **Future preferences are affected by earlier experiences (cheap today, expensive tomorrow?)**
Cost for Potential in DK / Offshore - Onshore

Offshore Resolve Model – Beurskens et al. 2011

Value to Improve

Onshore – Energinet.dk 2015
Offshore Resolve Model – Beurskens et al. 2011

“Germany Correction”

Value to Improve

Onshore – Energinet.dk 2015
Cost for Potential in DK / Offshore - Onshore

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Wrapping up

• The understanding of the roots and effects of social acceptance is valuable for citizens, developers, and policy makers.

• It is important to look beyond NIMBY: Negative externalities are real.

• Measurable monetary impact. How cheaper is it?

• Effects on project planning: improvements on project planning, less lost engineering hours.

• Decisions based on short-term cost can have negative middle/long-term effects
Questions?