Ministry of Economic Affairs
and Climate Policy

Dutch offshore wind energy policy and its consequences for innovation and measurements

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Wind Research for North Sea Wind Energy
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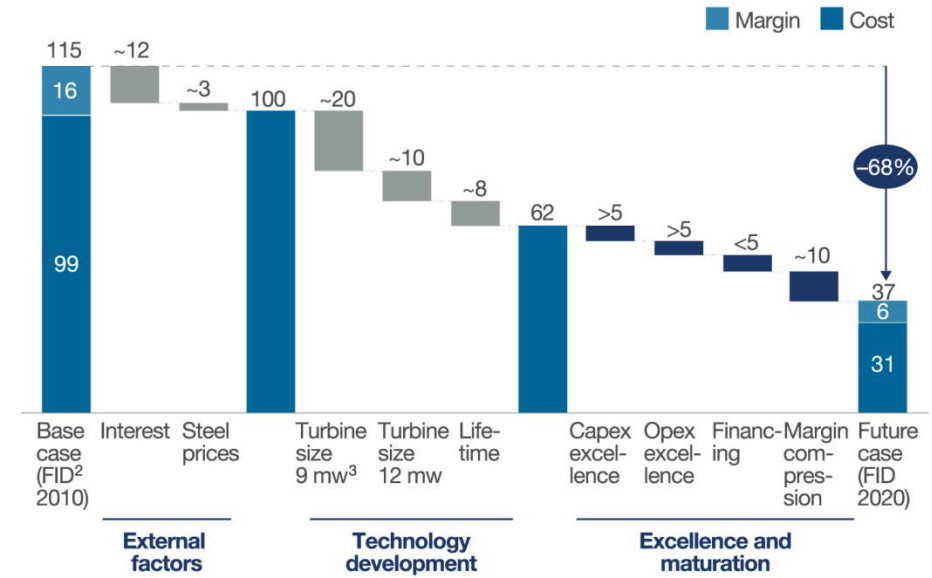
Offshore wind energy becomes mature

- Innovations in turbine (size) and maintenance are sufficiently market-driven
- Need for subsidies diminishes
- Need for innovations shifts from wind farms to interfaces with surroundings and other activities

Cost declines in offshore wind are being driven by external factors, technology development, and excellence.



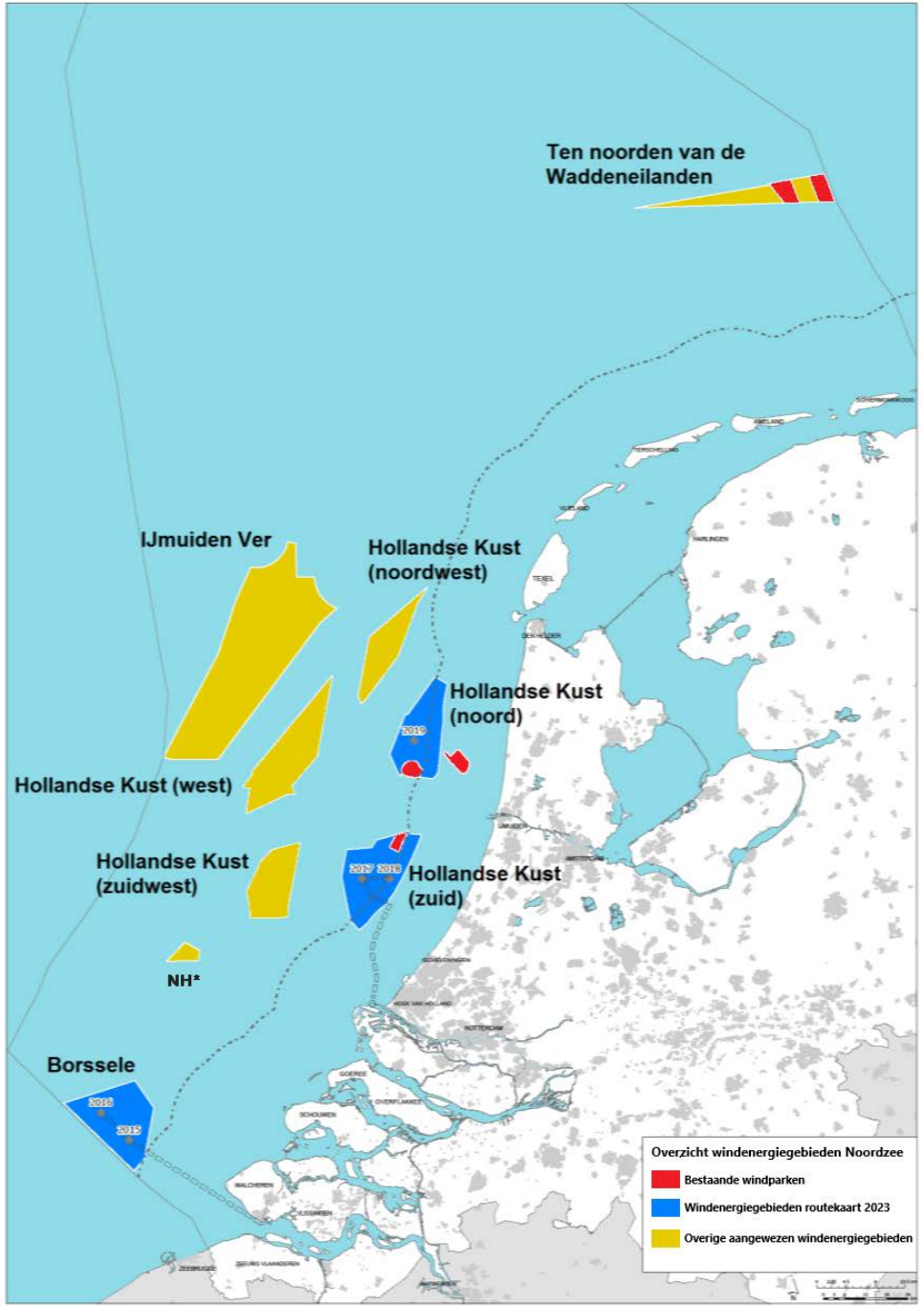
[1]Megawatt-hour.
[2]Final investment decision.
[3]Megawatts.

Source: Jens Hobohm, et al., *Cost reduction potentials of offshore wind power in Germany,* a joint report from the Fichtner and Prognos, 2013, prognos.com; *Cost reduction options for offshore wind in the Netherlands FID 2010-2020,* TKI Wind op Zee (TKI Offshore Wind), October 2015, tki-windopzee.nl; McKinsey analysis

McKinsey&Company

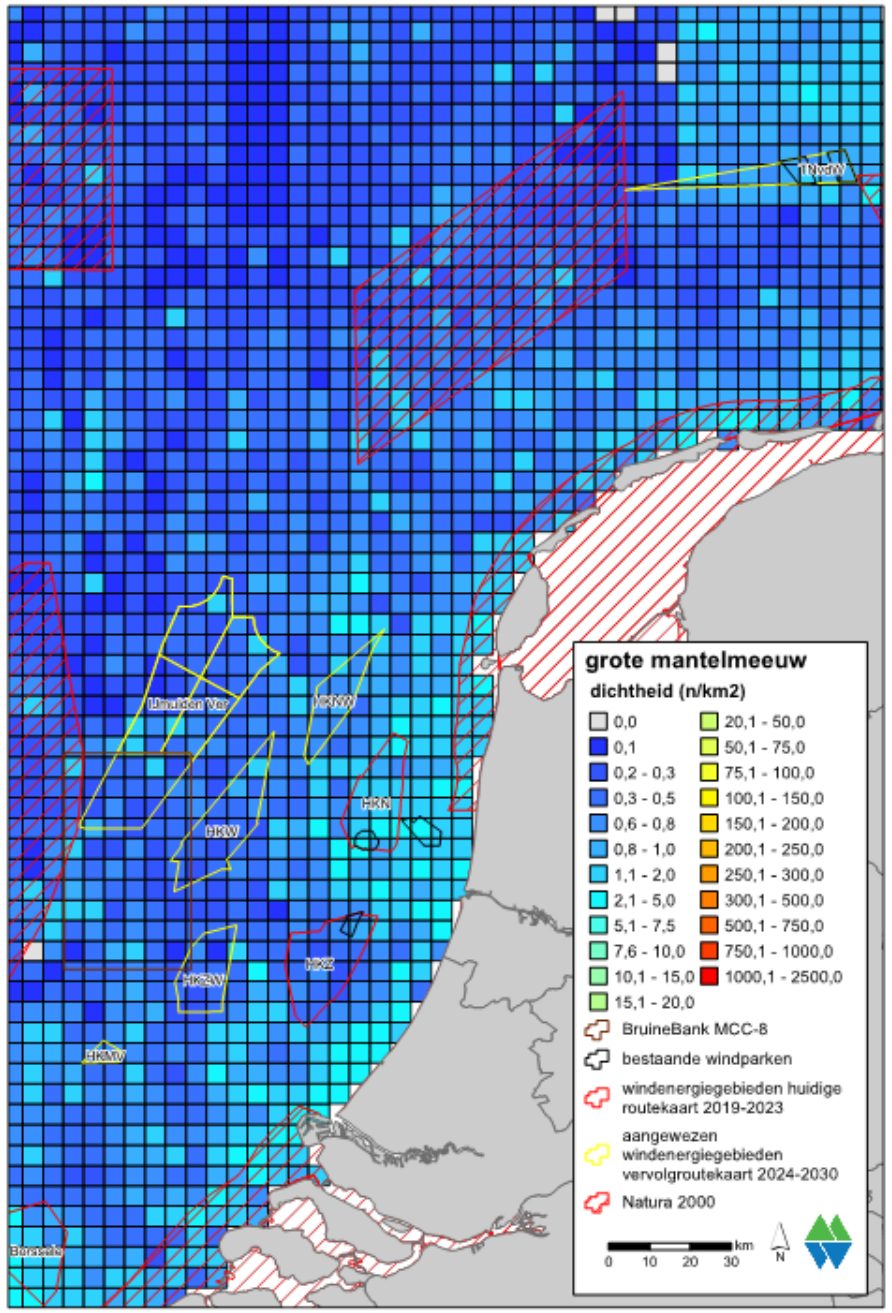
Road map 2030

- Growth from 4,5 GW in 2023 to 11,5 GW in 2030: 1 GW per year
- First tender in 2020/21
- Already designated wind farm zones offer sufficient space



Ecology

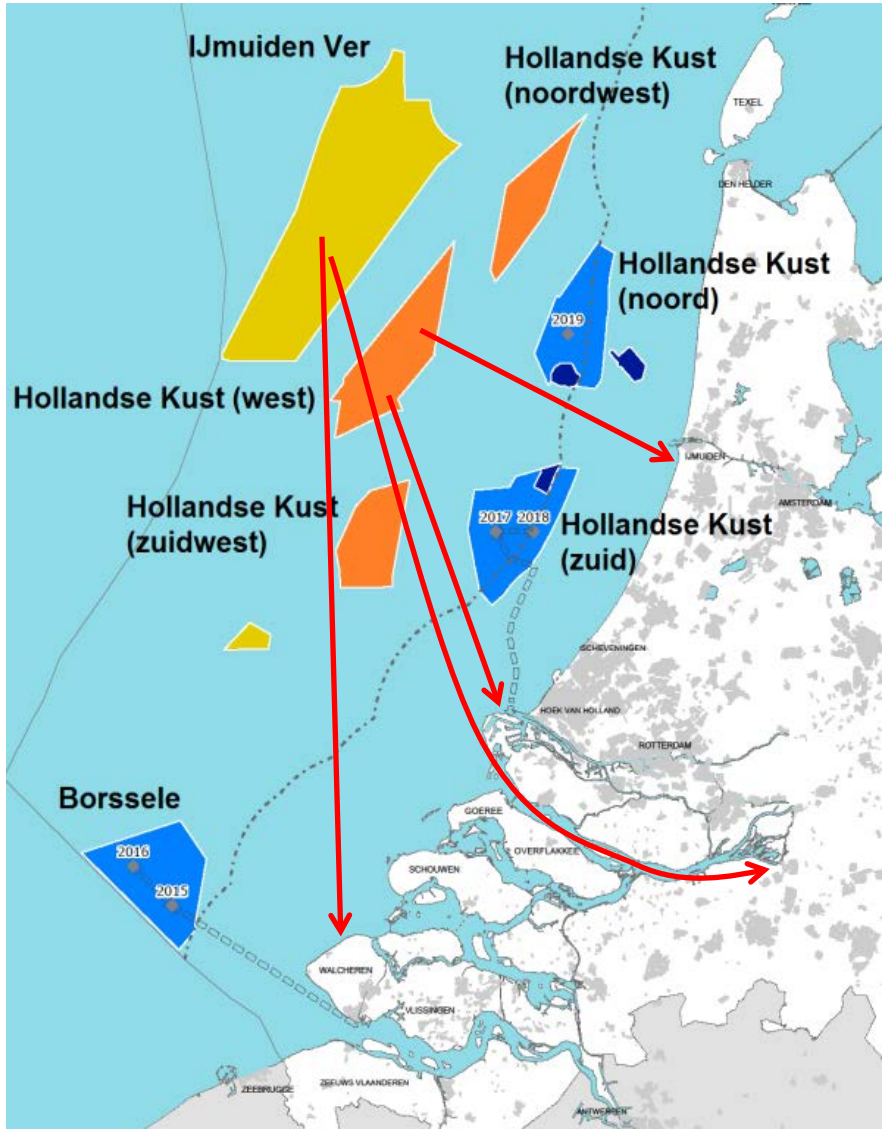
- Sea birds and bats: collision avoidance
- Sea mammals: noise reduction



Grid integration

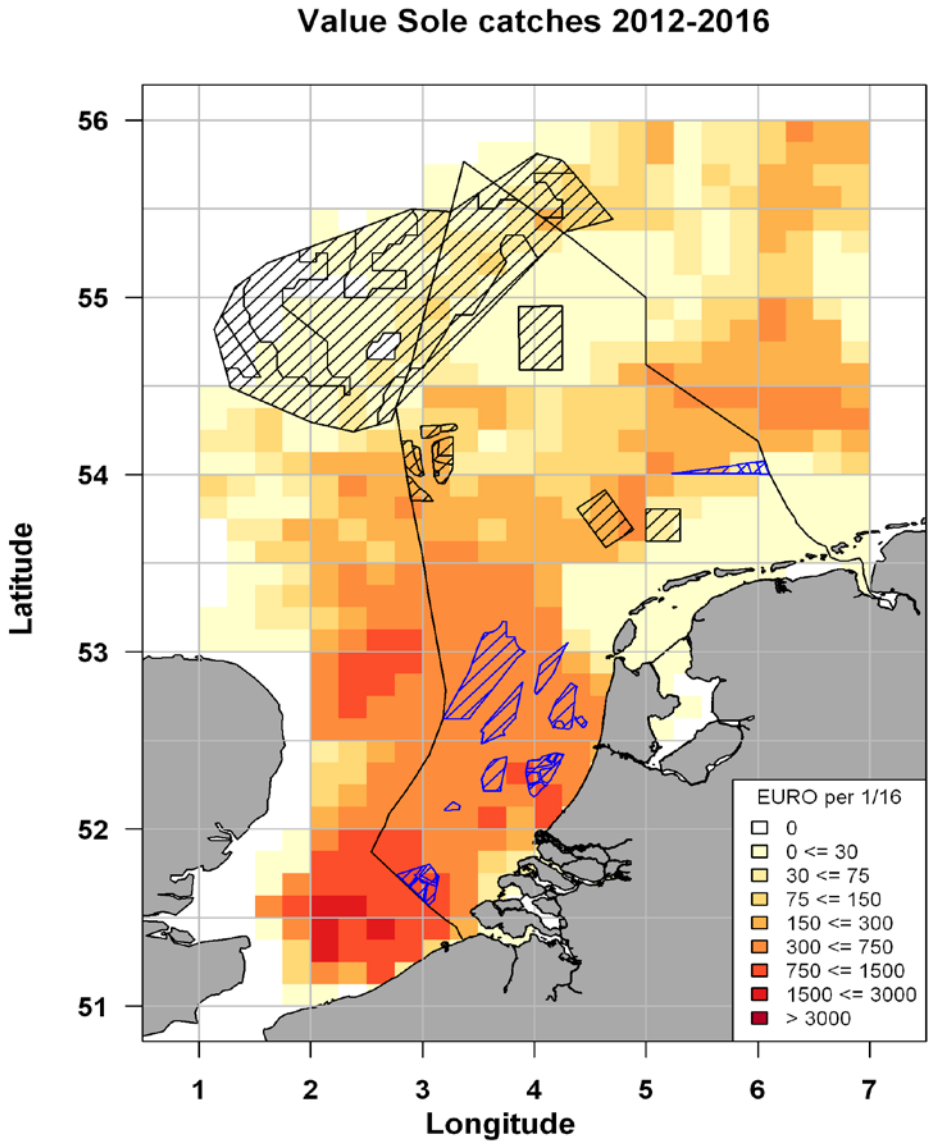
- Limited space and transport capacity near shore: there is an end to AC
- Shift to (HV)DC-technology
- Congestion management and phase-out of conventional power plants

- > 11,5 GW only possible with
  - grid connections further inland, and/or
  - substitution of oil and gas in industry, heating and mobility, and/or
  - conversion (e.g. H_2) and storage



Fisheries

- Political pressure to allow for fisheries
- Possible solutions:
  - Open wind farms for fisheries
  - Substitution of active fishing methods with passive ones and aquaculture
  - > 2030: new wind farm zones outside fishing grounds?



Sufficient meteo data available

- Inside wind farms: LiDAR on each TenneT-platform
- Before tender: Metocean campaign with floating LiDAR
- In vicinity: Lichteiland Goeree, Europlatform, K-13
- Germany: FINO-1