



Danish Energy Agency

Denmark's green transition and renewable energy system



Agenda

- Snapshot on Denmark's renewable energy system
- How did we get here?
 - Generic offshore wind timeline
- What is needed to make offshore wind happen?

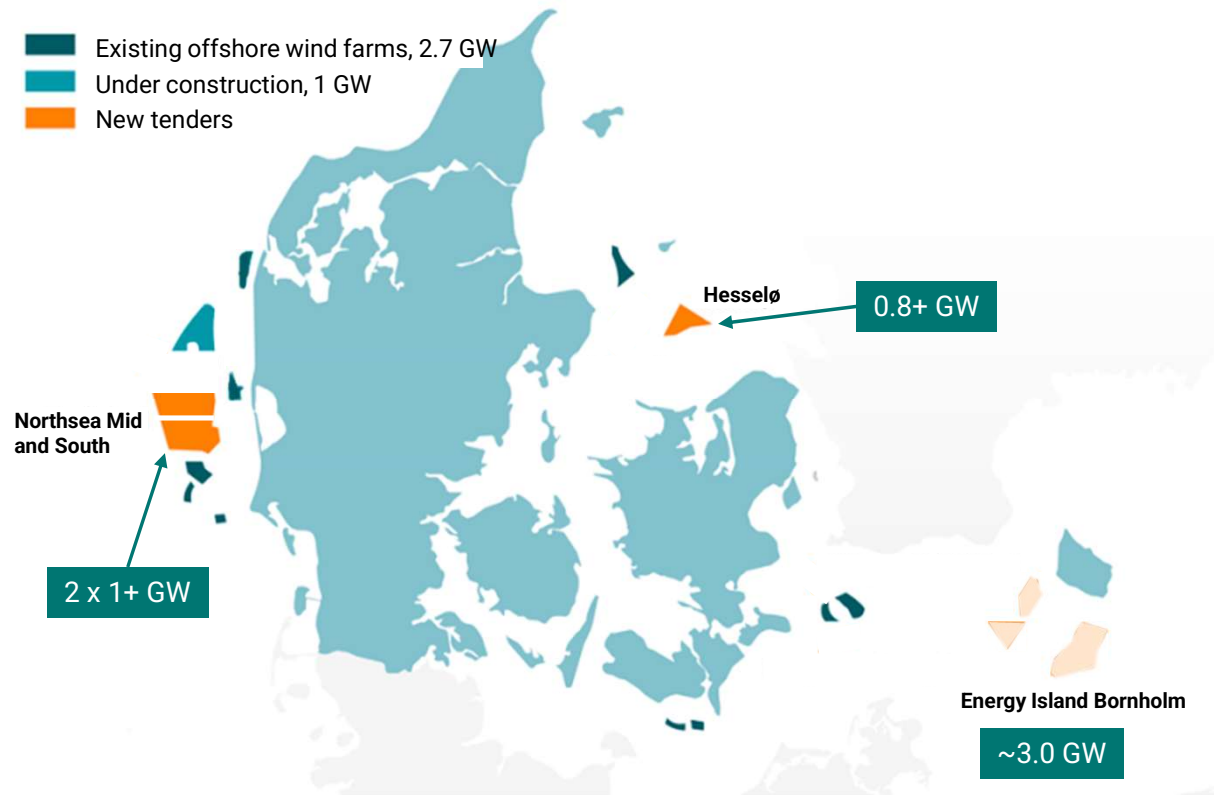


Renewable energy in Denmark

- Currently 5 GW onshore wind, 3.9 GW solar PV, and 2.7 GW offshore wind
 - First offshore wind farm 1991 (11 x 0.45 MW WTGs)
- From industry development and job creation to infrastructure and export, wind energy has a significant impact on the Danish society and economy
 - >100.000 employees in DK energy sector
~33.000 in wind industry.
 - 1 GW OW requires ~14.500 FTEs in DK

2024*

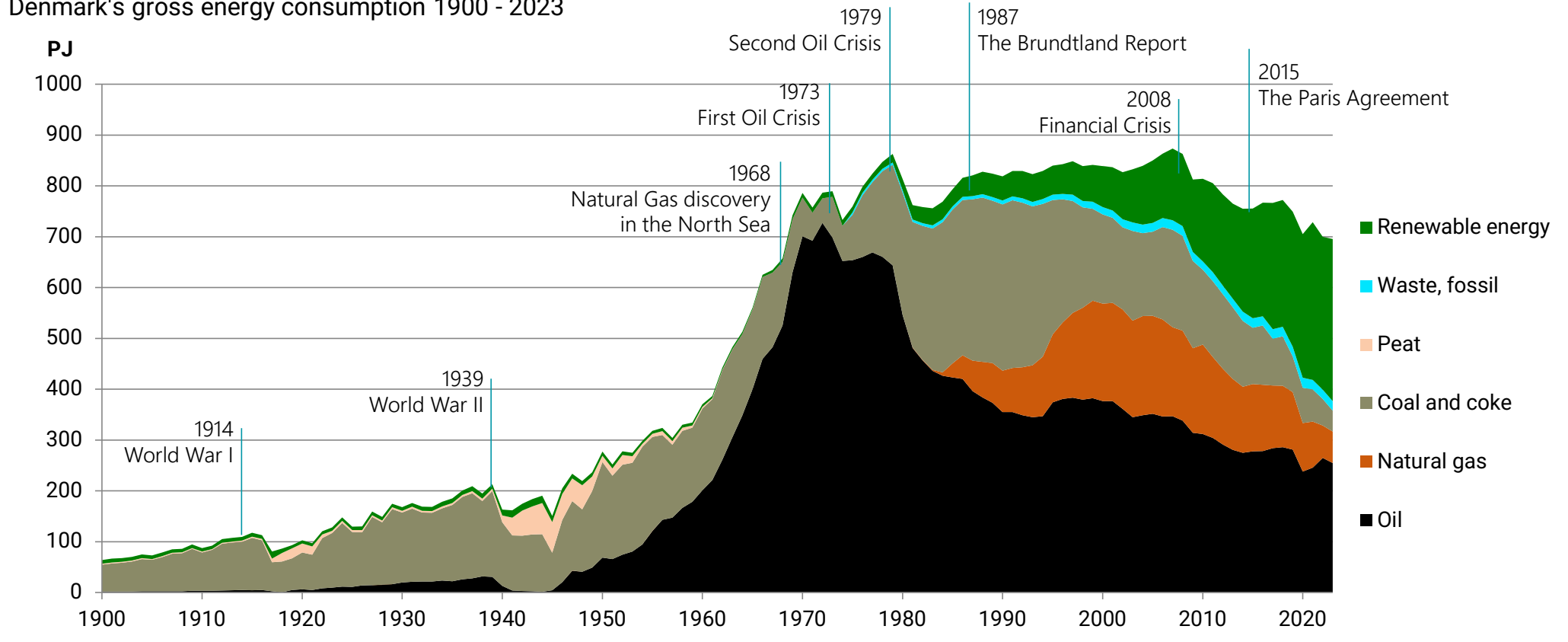
- 88.4 % net Renewable electricity (incl. biomass and biogas)
 - ~69 % from wind and solar
- > 99.996 % security of supply



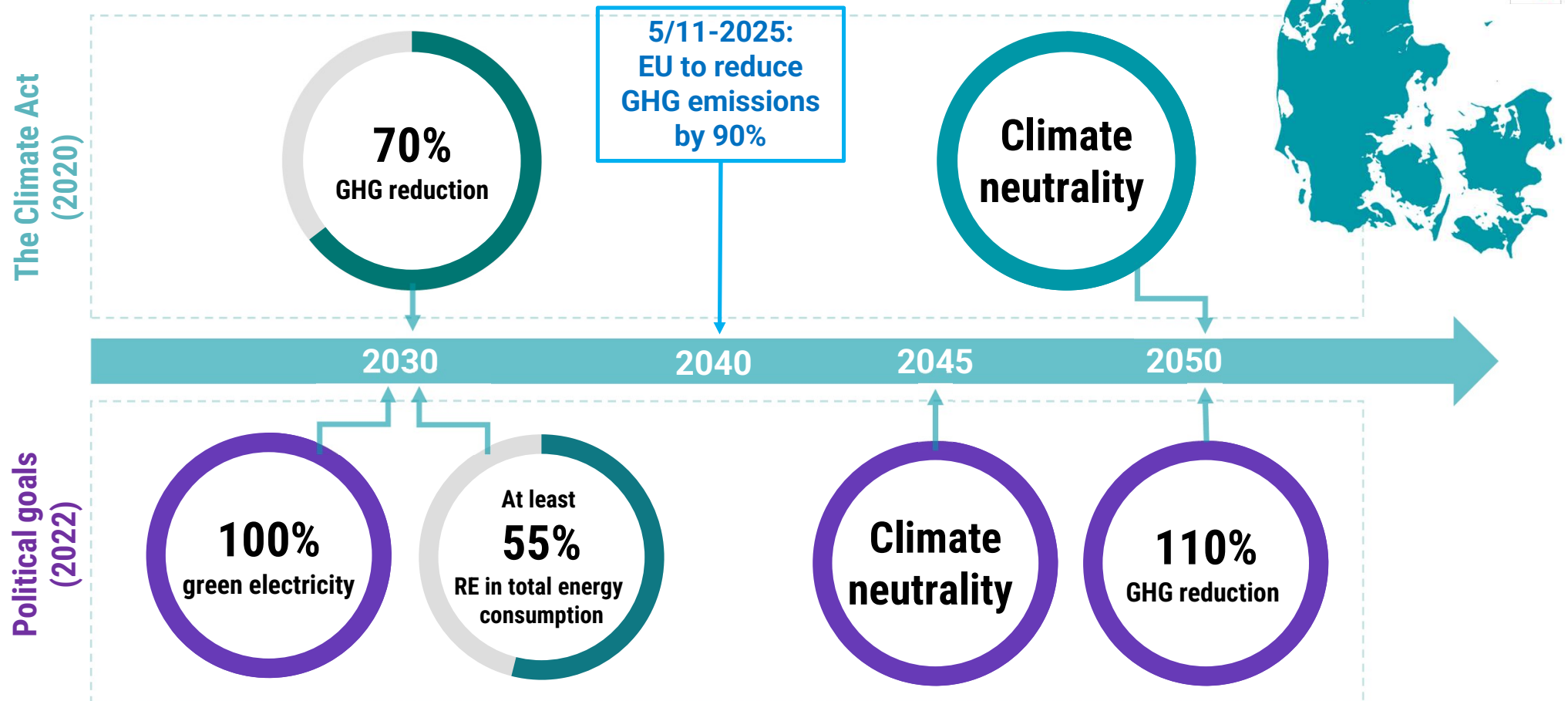
[*Invest in Denmark, 2025](#)

Two oil crises and global environmental movement motivated Denmark to embark on the energy transition journey

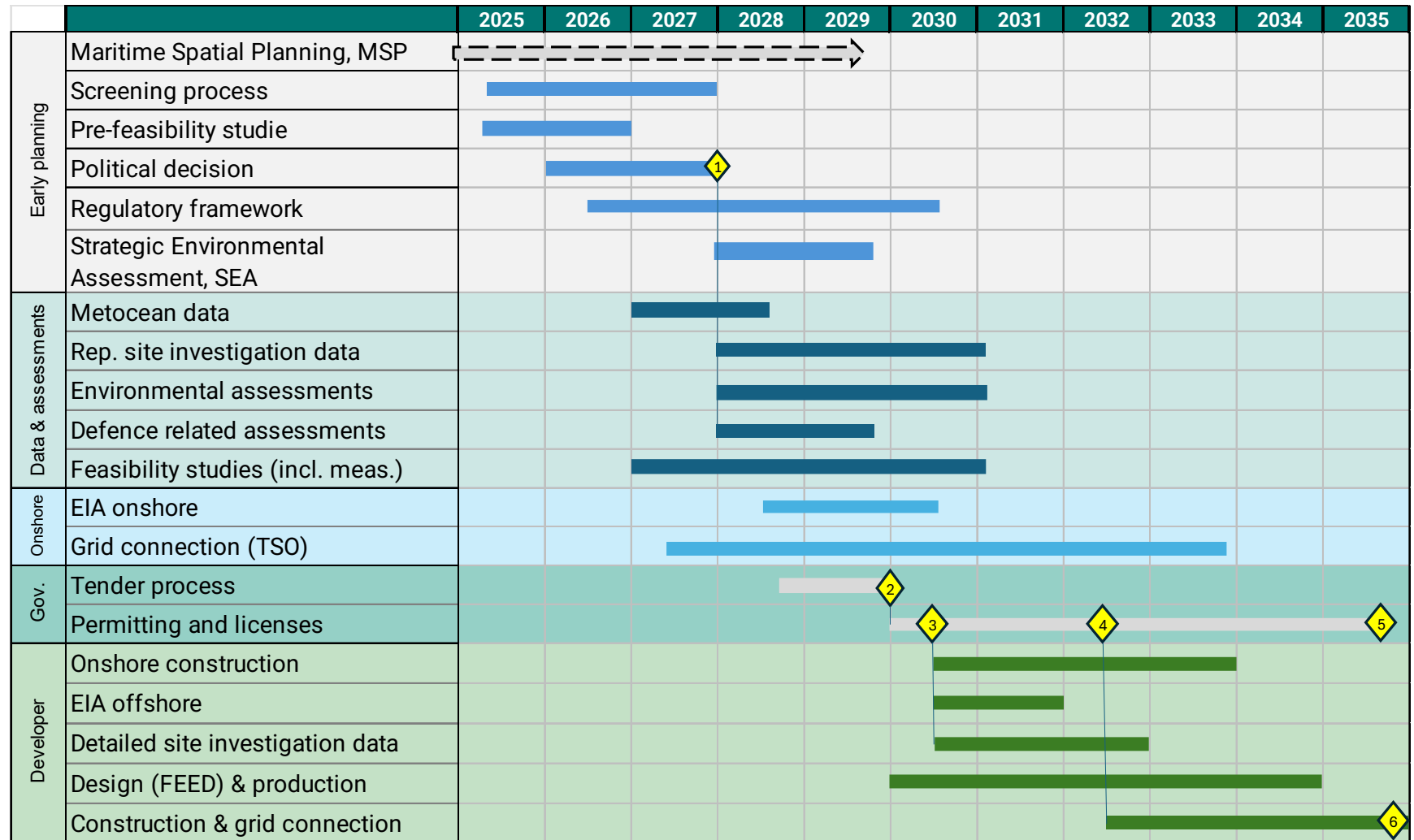
Denmark's gross energy consumption 1900 - 2023



Vision of a climate neutral society



Generic offshore wind timeline



What is needed to make offshore wind happen?

- Is there a political will? – like e.g. in EU: The Clean Industry Deal → legislation and regulatory framework
- Prioritize collaboration between authorities and optimize administrative processes
- The recent global financial crises (interest rates and inflation), increased costs on raw materials and challenged supply chain -> promote state subsidy or alternative financial mechanism for both RE production and also downstream industries and new technologies (e.g. storage, hydrogen, PtX, CCUS, ...)
- Investments in infrastructure. E.g. transmission grids, ports, vessels, roads, hydrogen pipelines, ...
- Increase electrification with the cheapest production technologies → Renewables
- Promote green steel, cement, chemicals etc. – like e.g. Industrial Decarbonisation Bank, Steel Action Plan
- Support procurement of power → more PPAs, removal of taxes, tariffs and charges, allow direct lines, ...
- Apply efficient permitting rules and processes – like e.g. Germany
- Further education of skilled employees
- Acknowledge that 2030 climate goals created bottlenecks leading to delays. Industry needs predictability and stability → long project pipeline
- Make it attractive for industry and developers to invest and settle in the region
- Acknowledge global geopolitical situation creates uncertainty and plan accordingly → security of supply



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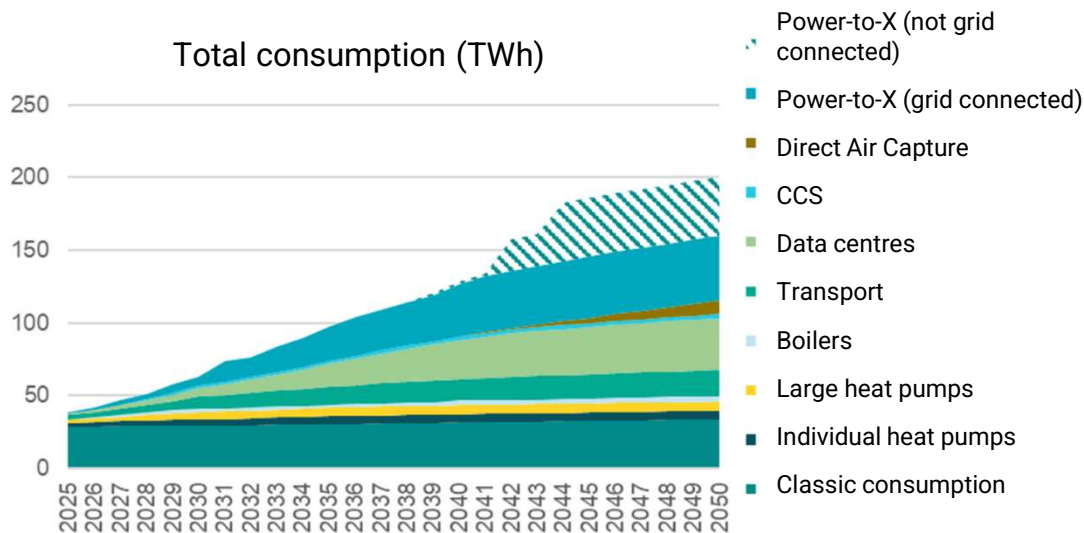
Thank you



Towards 2050 - Denmark

Today: 2.7 GW OW, 5 GW OnW and 3.9 GW solar PV (~69% el. prod)

2050: Political ambitions of **4 x onshore capacity** and **52 GW offshore wind** in Denmark – 35 GW in North Sea and 17 GW in Inner Danish waters and Baltic Sea.



Analysis Assumptions for Energinet, AF25

Danish Energy Agency

Excess capacity for:

- Increased electrification in Denmark
- Export of power, hydrogen and PtX derived products:
 - SAF, ammonia, e-methanol, etc.
- Hydrogen infrastructure
 - Pipeline, storage - supports flexibility



Side 9

Danish offshore wind farms



