



A Danish Perspective on Energy Security

*PA ENERGY Conference
Vilnius, 17.10.2024*

Agenda

An insight into the Danish energy system

- The energy system in numbers
- The Danish transition
- What is ahead?

The challenges

- A new reality
- Factors to keep in mind

Regional cooperation

- A perspective on collaborative efforts

A short introduction

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- Center for Risk Preparedness, Danish Energy Agency

Please reach out for collaboration on topics;




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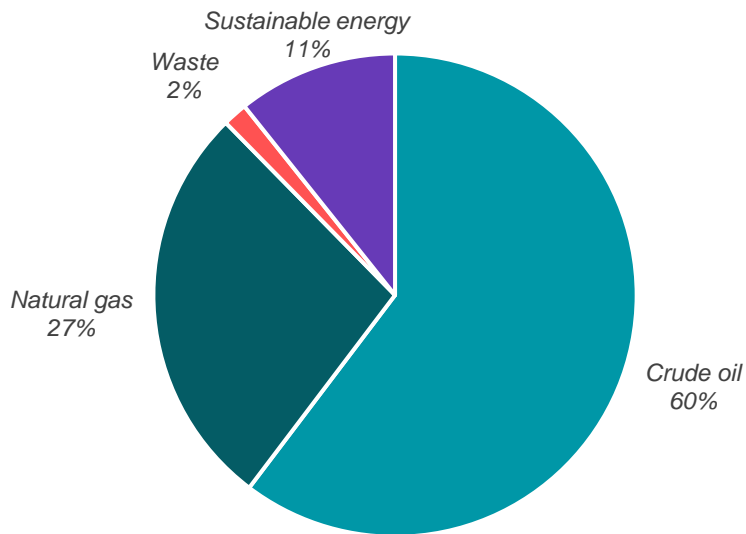
An insight into the Danish Energy system

An insight into the Danish energy system

Development in energy production

Energy production 1990

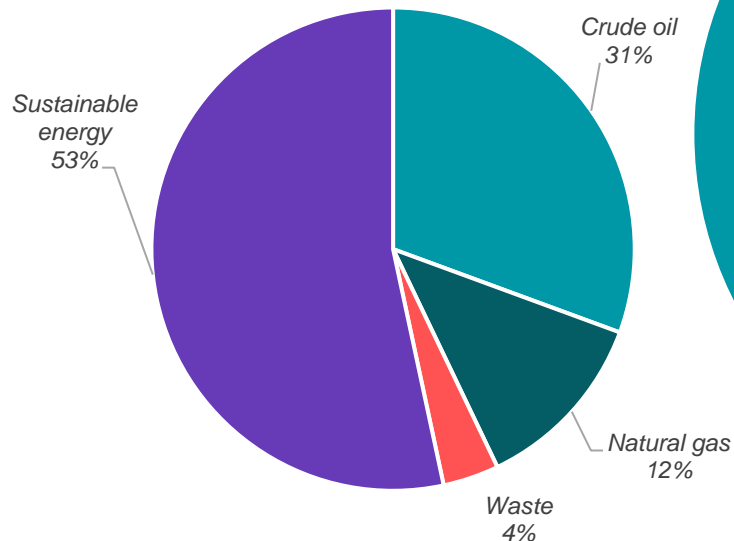
Total = 424 PJ



33 years

Energy production 2023

Total = 411 PJ

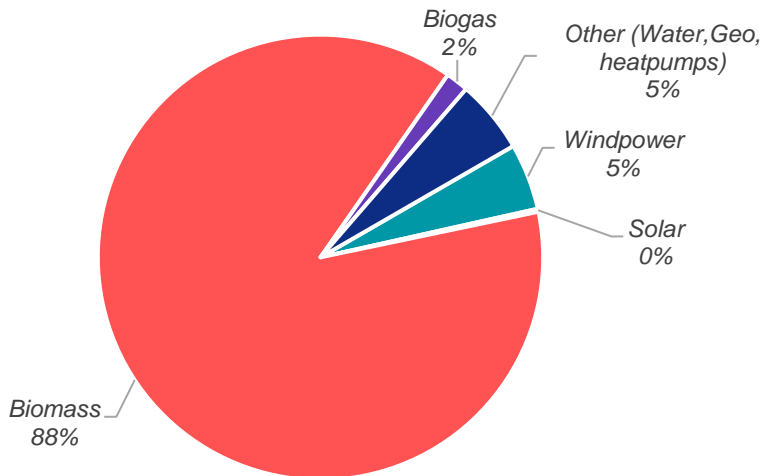


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Development in sustainable energy production

Sustainable energy production 1990

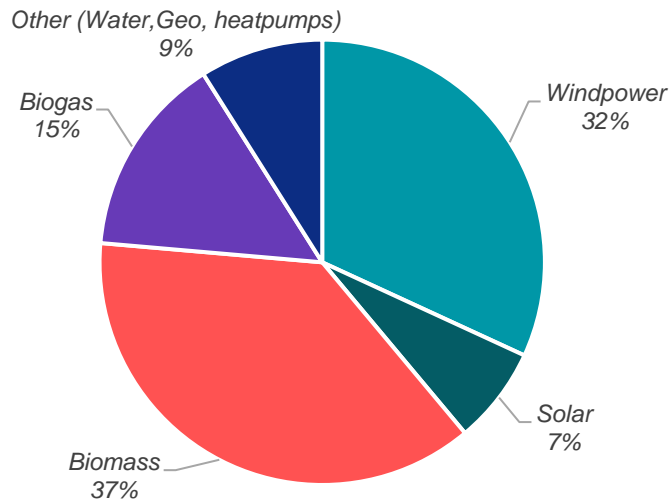
Total = 45 PJ



33 years

Sustainable energy production 2024

Total = 219 PJ



An insight into the Danish energy system

An overview of Denmark

What characterizes Denmark with regards to resources and opportunities?

- Natural resources are offshore
- Large coastline, large offshore areas
- Relative large agricultural sector
- Quite windy



ELECTRICITY SYSTEM 11-03-2024, 12:30

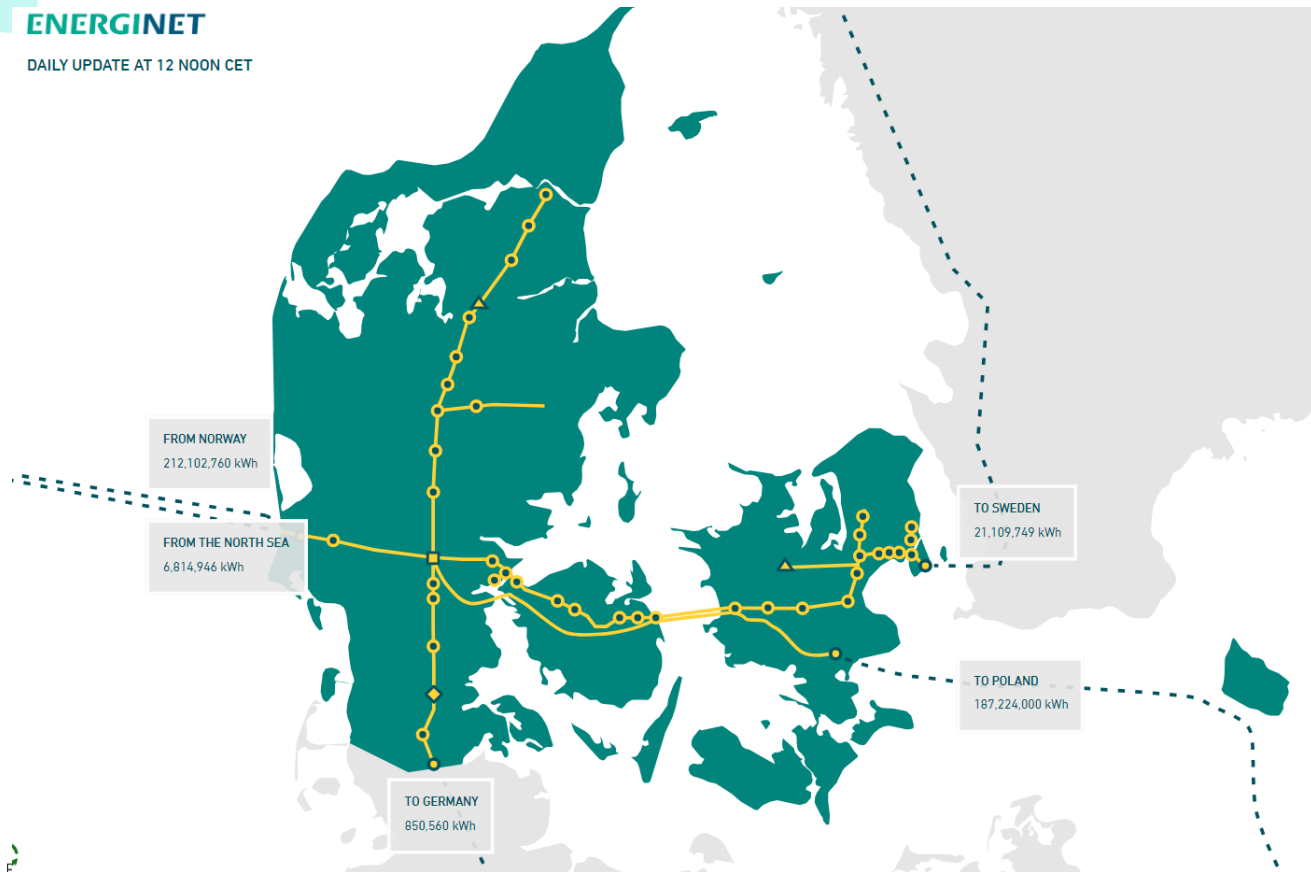




GAS SYSTEM 11-03-2024

ENERGINET

DAILY UPDATE AT 12 NOON CET



DAILY DATA IN THE GAS SYSTEM	
INJECTED BIOMETHANE	22,619,248 kWh
FROM NORWAY	212,102,760 kWh
FROM THE NORTH SEA	6,814,946 kWh
TO GERMANY	850,560 kWh
TO POLAND	187,224,000 kWh
TO SWEDEN	21,109,749 kWh
DANISH GAS STORAGE FACILITIES (out of storage)	28,153,687 kWh
CONSUMPTION IN DENMARK	74,449,678 kWh

SYMBOL DESCRIPTION	
GAS STORAGE	▲
POINT OF TRANSIT	●
M/R-STATION	○
MEASUREMENTS	■
GAS PIPE	—
GAS PIPE OWNED BY OTHERS	- - -
BIOMETHANE JUNCTION	◆

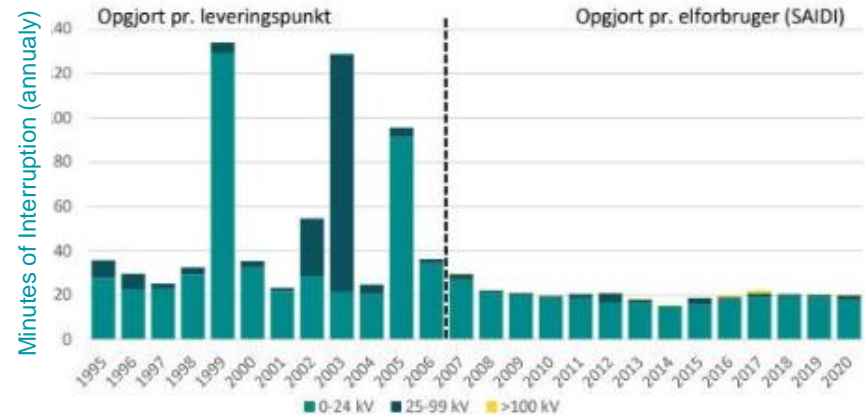
MORE ABOUT GAS QUALITY AND DAILY DATA	
ENTRY/EXIT QUALITY AND GAS FLOW	
GAS QUALITY AND GAS FLOW PER MR-STATION	
COMMERCIAL GAS AMOUNTS	

An insight into the Danish energy system

Security of Supply is high and have increased

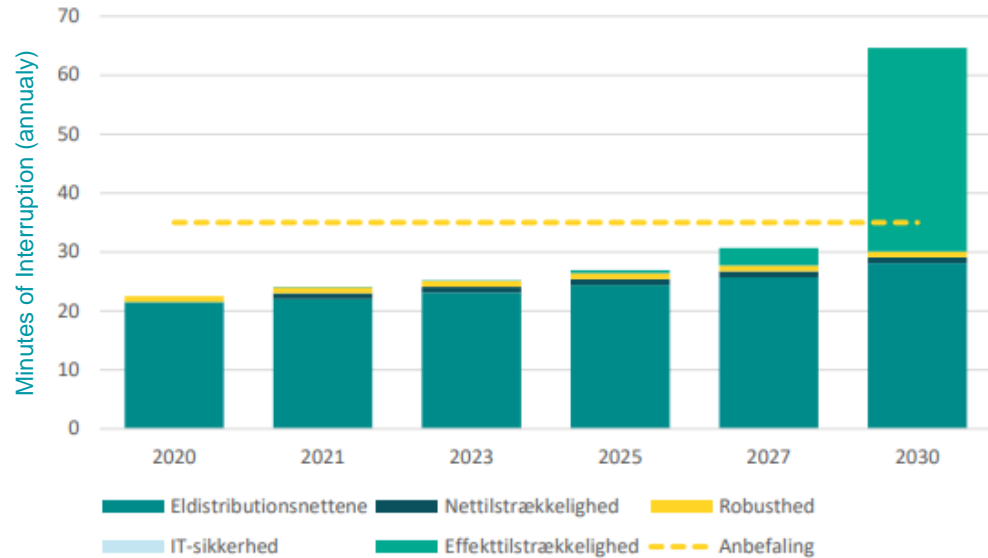
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Minutes of Interruption in Europe



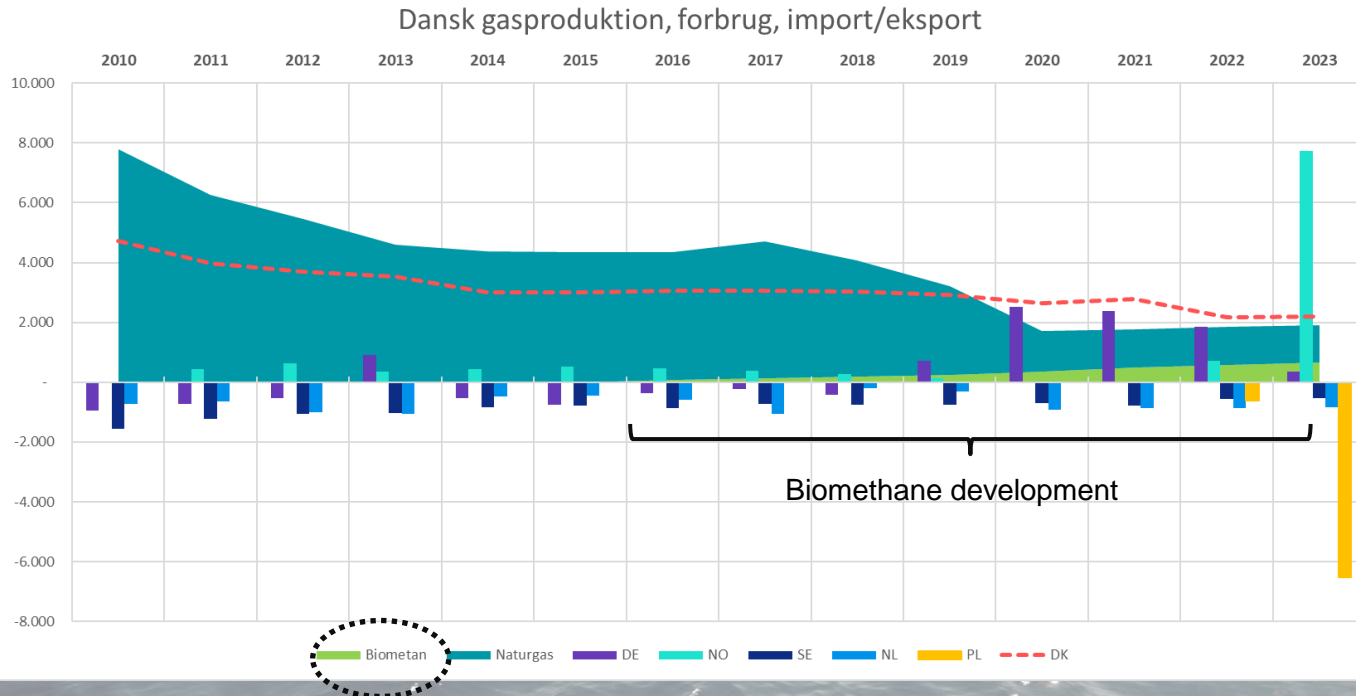
An insight into the Danish energy system

Security of Supply will not improve during the green transition



An insight into the Danish energy system

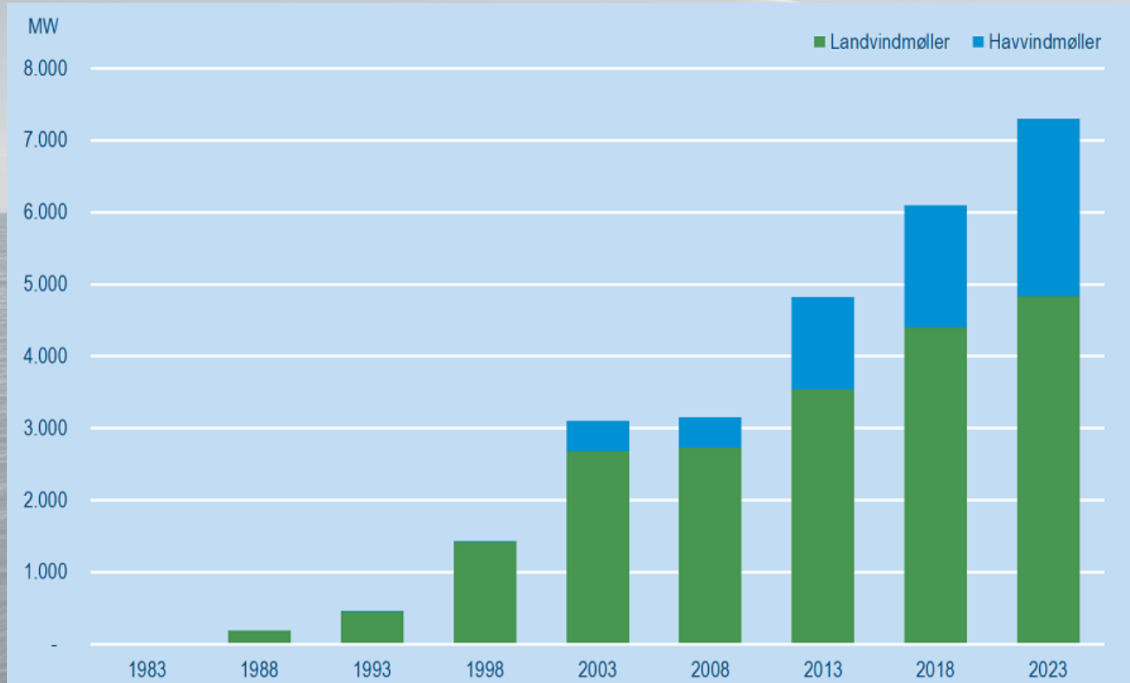
Development in biogas



- Biomethane covers some of the danish use of of gas; from 0% to 40% in 10 years
- Goal is 70% in 2030

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Development wind production



An insight into the Danish energy system

Offshore wind potential

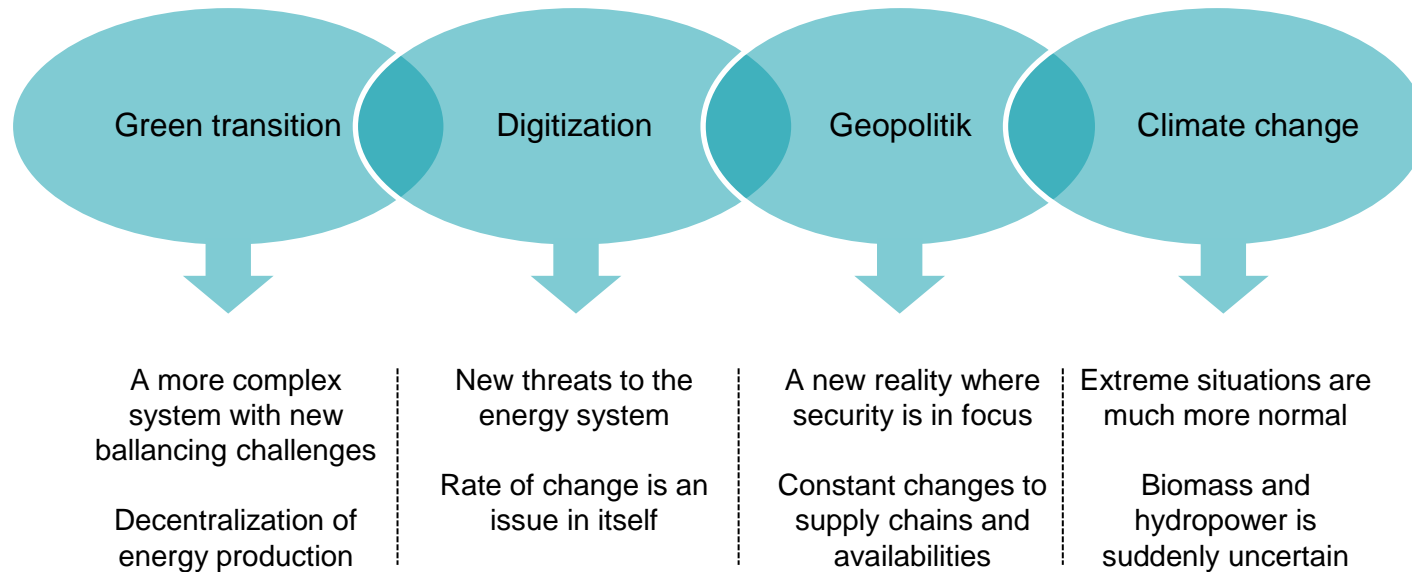
- Offshore wind production today ~2,6 GW
- Offshore wind potential for ~35.000 km² = ~40 GW
- Most is far from shore (DC connections)
- Far too much electricity for Danish consumption
> Export or PtX conversion?

The challenges

The challenges

A new reality

The energy system and the surrounding world has changed



The challenges

What to look out for

The DEA has carried out an initial mapping of risks to the energy sector in the coming 5, 10 or 20 years. These are some of the pointers to consider:

- Large leaps in IT threats could be around the corner (AI, quantum)
- Global supply chains are changing, and so are global alliances
- Business cases for transition projects are much more vulnerable, due to volatile prices, scarcity of supply or even security
- More renewables require a more complex energy system; How about spare parts?
- More interconnectivity increases security and decreases prices ; But it also challenges new project business cases and brings new vulnerabilities (N-1)

Regional cooperation

Regional cooperation

Some suggestions for collaboration

Exchange knowhow



Systematized knowledge sharing with regards to:

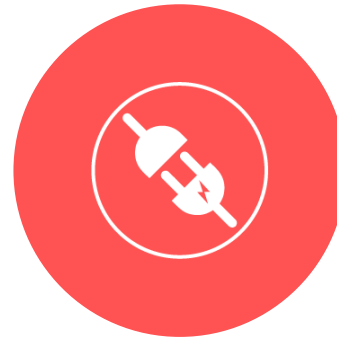
- Energy production
- Surveillance and protection of critical infrastructure

Cyber collaboration



Increased collaboration on threat assessment, and EU legislation to counter increasing vulnerabilities.

Interconnectivity



Increased interconnectivity to increase robustness.

Crossborder partnerships



Formalized partnerships with regards to:

- Surveillance and protection of critical infrastructure
- Critical spare parts and cold start capacity



Thank you

QUESTIONS

Ask away

”

If there are no stupid questions, then what kind of questions do stupid people ask?

Do they get smart just in time to ask questions?

- Scott Adams

