

How to reach the National Goals

Analyses of the Energy System of the
Future/DH & CHP

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The Danish Goals

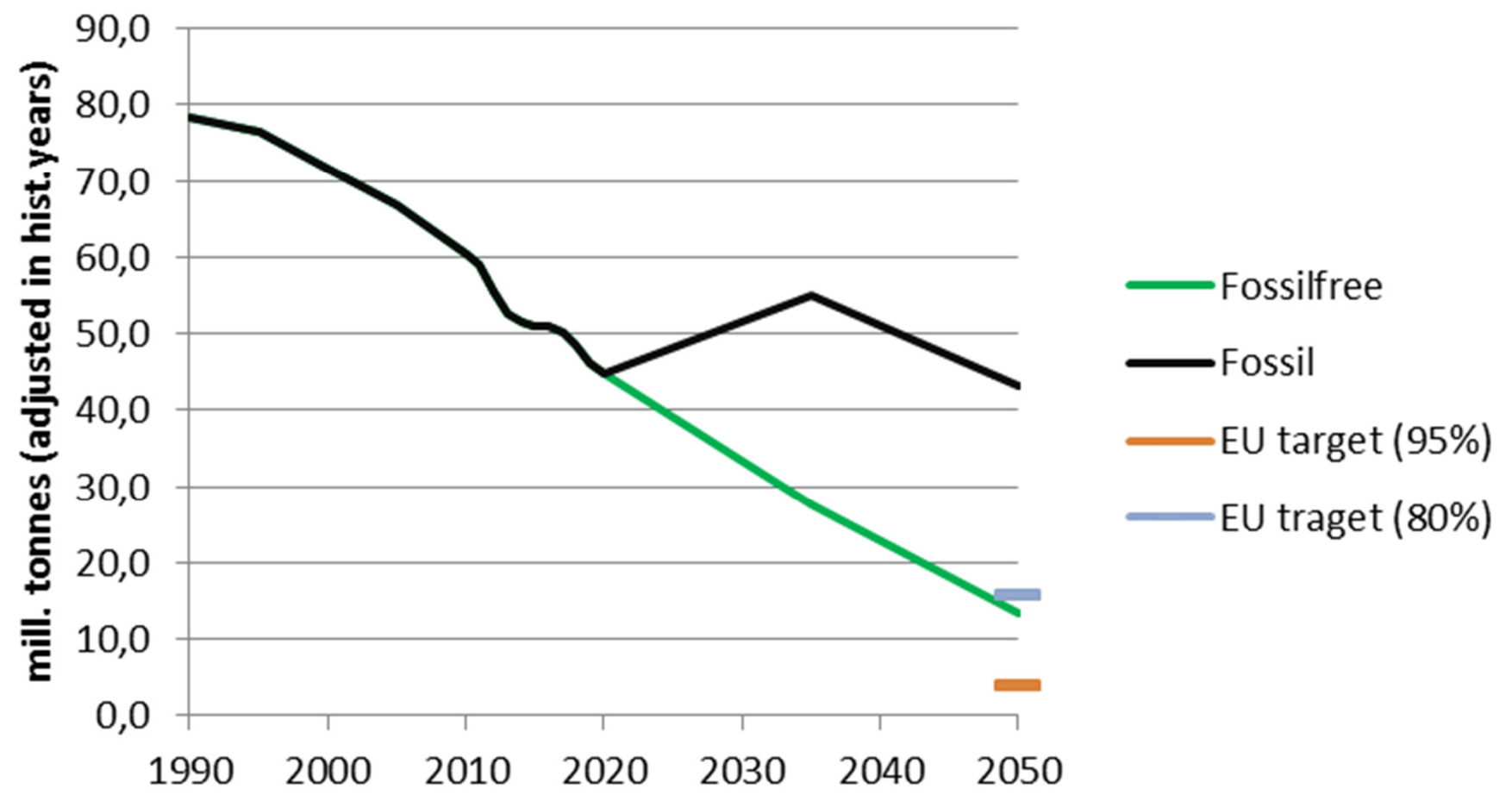
2050

- The energy supply is 100 % based on RES

2035

- The electricity and the heating sector are 100 % based on RES

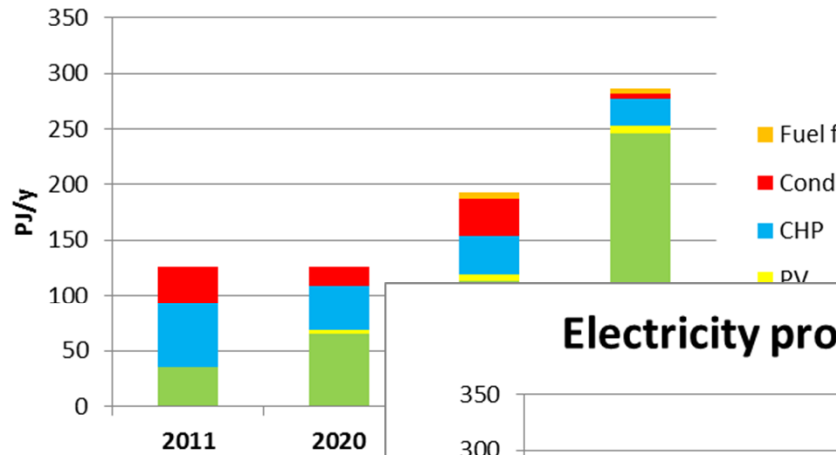
GG emissions towards 2050



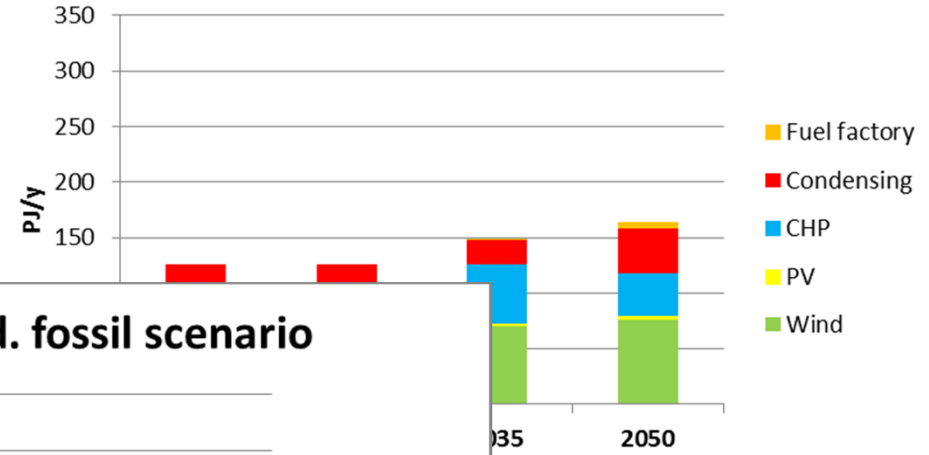
The Energy Scenarios

- The scenarios focus on 2035 and 2050
- The purpose is to illustrate and clarify:
 - What are the technical possibilities and what are the challenges?
 - Do we have sufficient resources when looking at all the sectors as a whole?
 - When do we have to determine the way forward?

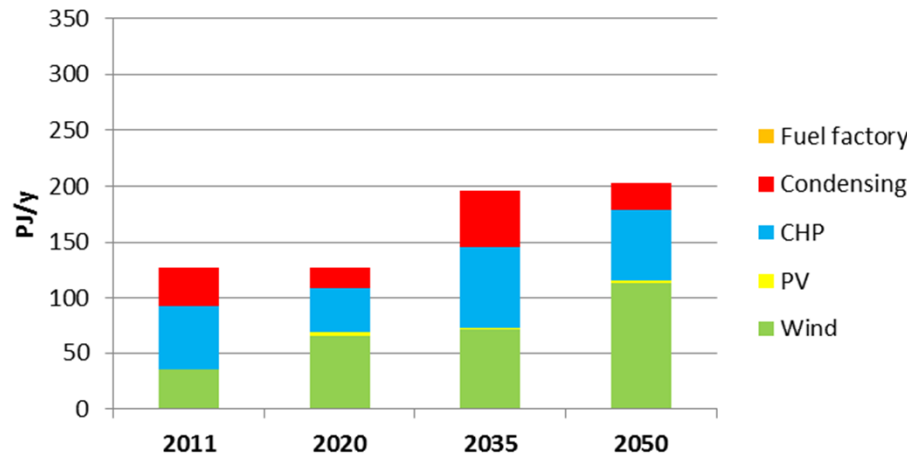
Electricity prod. wind scenario



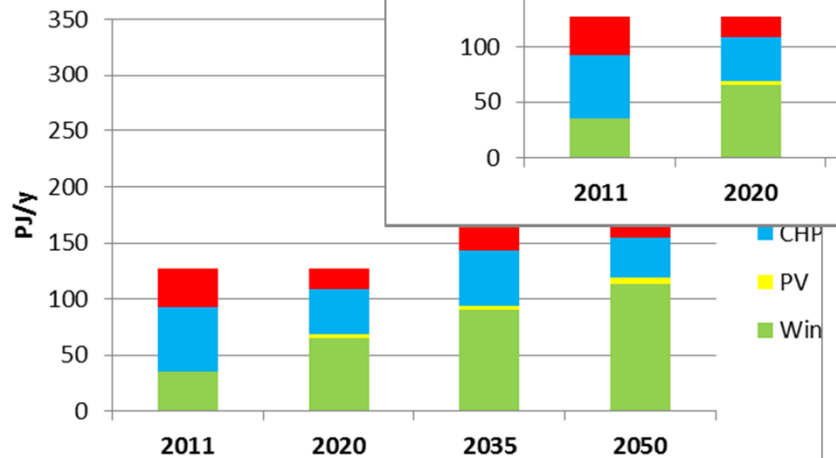
Electricity prod. bio+ scenario



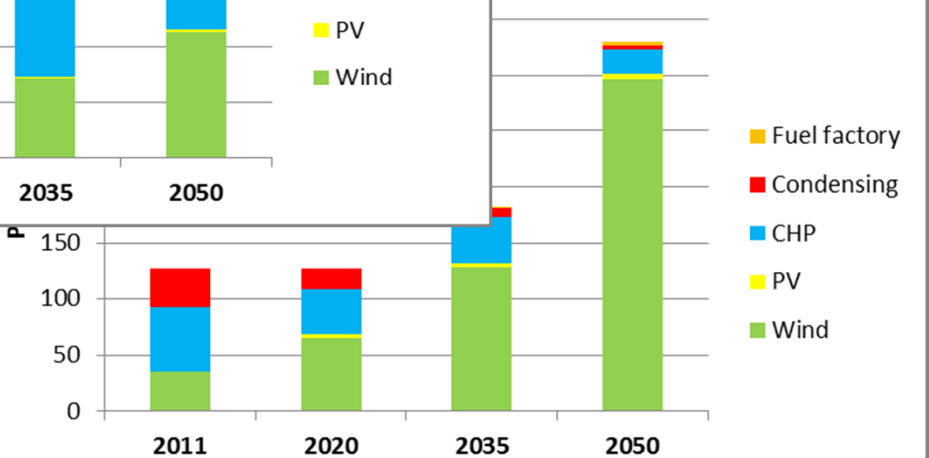
Electricity prod. fossil scenario



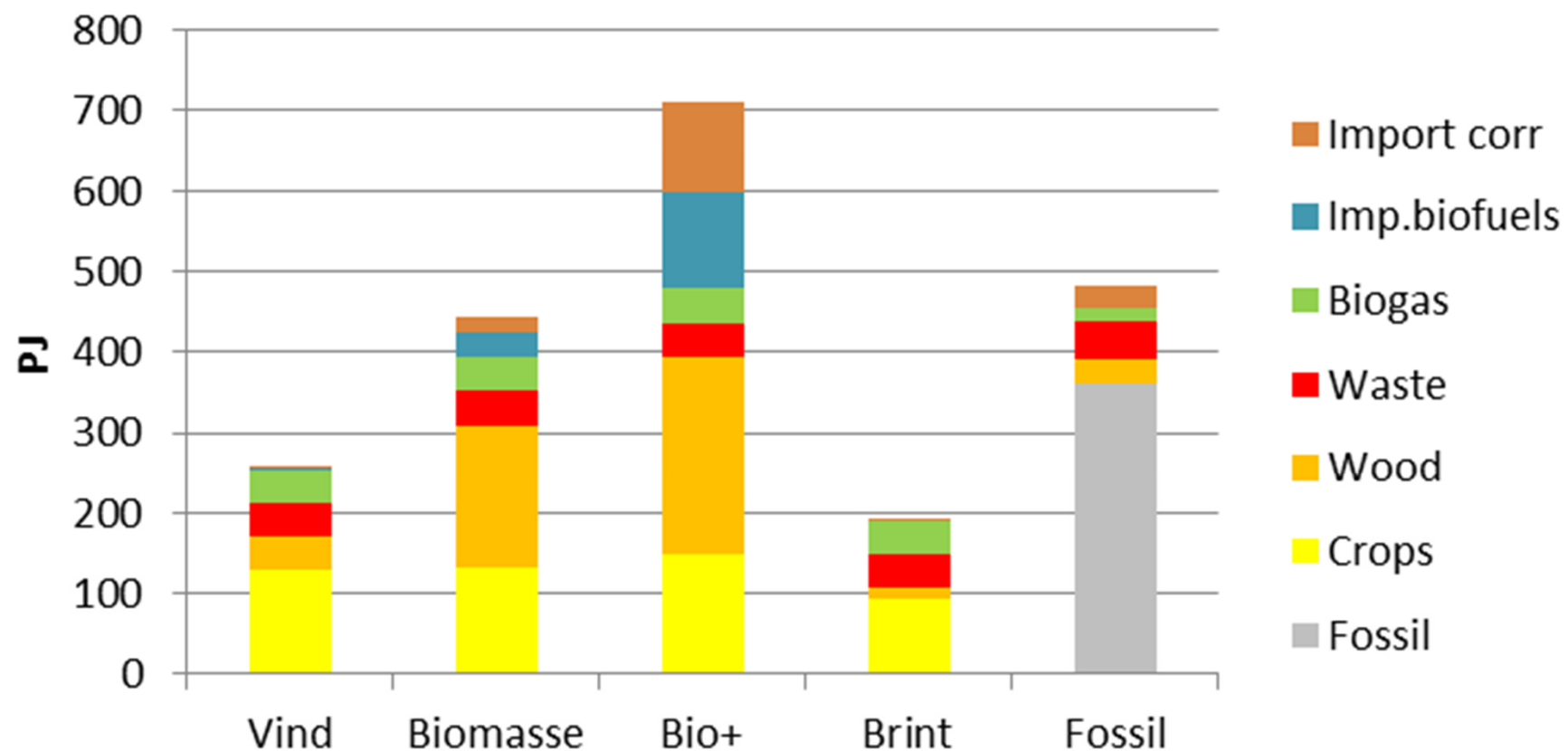
Electricity prod. hydrogen scenario



Electricity prod. hydrogen scenario



Fuel consumption 2050

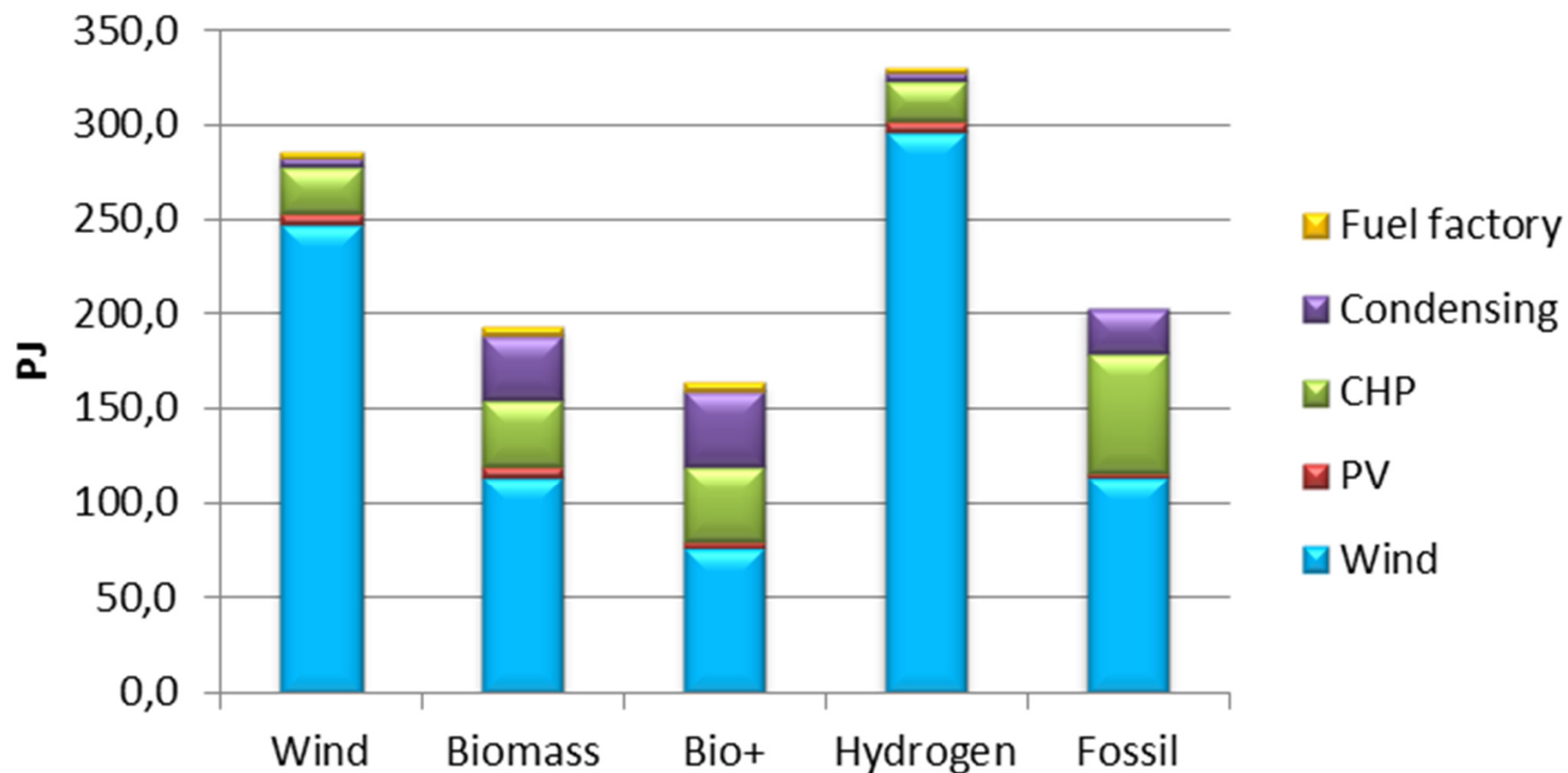


The analyses of the sectors

Electricity

- In all the scenarios the electricity sector can cope with the challenges of security of supply at least to 2025.
- Closing of thermal capacity. In the wind scenario much CHP will close down
- Increasing cross border trade.
- 2035 and 2050 lack of capacity might occur

Electricity production 2050



The analyses of the sectors

Gas

- The infrastructure of the gas sector is to serve for the transportation and storage of energy (renewable energy gases)
- Natural gas will gradually be out-phased and the gas infrastructure will contribute to security of energy supply

The analyses of the sectors DH

- How is DH to be produced in future?
- Should DH continue to expand or be restricted
- Energy savings reduce the demand for heat
- Individual heating to DH in the DH areas increases the need for heat sources at DH-plants
- Moving to the big cities increases the demand for DH
- Still a potential for increasing to 62 % of the heat demand – today it is 50 % (depends on the economics)

Analyses of DH and CHP

- More electricity generation on wind means less CHP (base-load) but more need for a flexible production capacity (n-gas and RES-gas)
- More fluctuating electricity generation has also bearings on the economics of CHP – in many cases (mainly smaller DH) heat pumps (large heat storage facilities) will be preferred
- Larger DH-networks are expected to be based on biomass CHP
- DH is going to be based on biogas, heat pumps, solar, geothermal and surplus heat
- DH can have a balancing and storage role in future