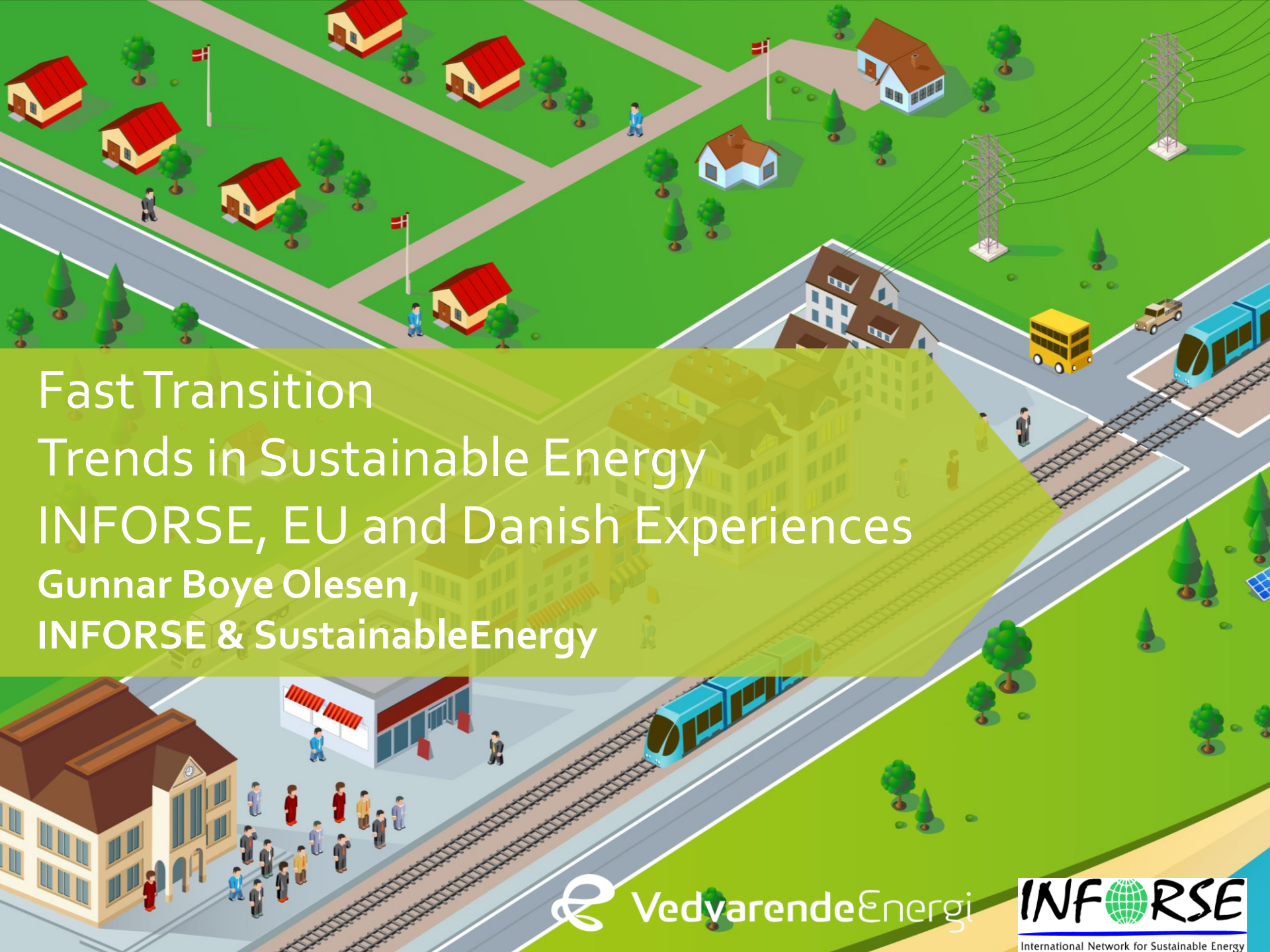
INFORSE-Europe Sustainable Energy Seminar
August 21-24, 2017
Nordic Folkecenter for Renewable Energy, Denmark

Transition Towards Sustainable Energy – Denmark

by Gunnar Boye Olesen; August 21, 2017
INFORSE-Europe, SustainableEnergy

See the Program and the Proceedings at: http://www.inforse.org/europe/seminar_17_DK.htm



Fast Transition
Trends in Sustainable Energy
INFORSE, EU and Danish Experiences

Gunnar Boye Olesen,
INFORSE & SustainableEnergy

VedvarendeEnergi

INFORSE
International Network for Sustainable Energy

National and EU-wide Transitions to 100% Renewable Energy

- Global Vision, 2050
  - Vision for EU-27, 2040
    - Belarus, 2045
    - Bulgaria, 2040
    - **Denmark, 2030**
    - Estonia, 2040
    - Hungary, 2040
    - Latvia, 2040
    - Lithuania, 2040
    - Romania, 2040
  - UK ZeroCarbonBritain, 2030
    - Ukraine, 2050

INFORSE

International Network for Sustainable Energy

The Climate Challenge

We now live in “Anthropocene”, the geological period, where humans governs the earth & the climate by our actions

The countries of the world have committed to limit human climate change to 3.5’C, equal widespread catastrophes

We must limit global warming to 1.5 - 2’C:
go to 100% renewable energy until 2050, reduce all greenhouse gases to net zero also until 2050

DENMARK:

Denmark has targets of 100% renewable energy economy-wide in 2050 and 50% in 2030. We expect that in 2020 more than 50% of Danish power will be windpower (41% today)

SustainableEnergy and Friends of the Earth Denmark promote 100% renewable energy economy-wide by 2030, – 16 years from now !

The project "Hurtig omstilling til vedvarende energi – ud af den fossile blindgyde" (Fast Transition to Renewable Energy) documents how a fast transition can be done.

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The Sustainable Energy Path

Increase End-use Energy Efficiency

Limited Growth in Energy Services

Efficient Energy Supply

Renewable Energy

Intellligent & flexible energy systems

Energy Transition until 2030 is Realistic for Denmark & the Economy can Benefit

- Analysis of energy system – hour by hour with the EnergyPLAN programme shows that an electricity system with 84% windpower and 7% solar can supply in all hours of the year.
- Compared with continued use of fossil fuels, renewable energy supply can be cheaper in 2030, if we also save energy and make a transport transition

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Expand renewable energy

11000 MW windpower in 2030, half on land (today 5300 MW)

4000 MW solar PV in 2030 (today 800 MW)

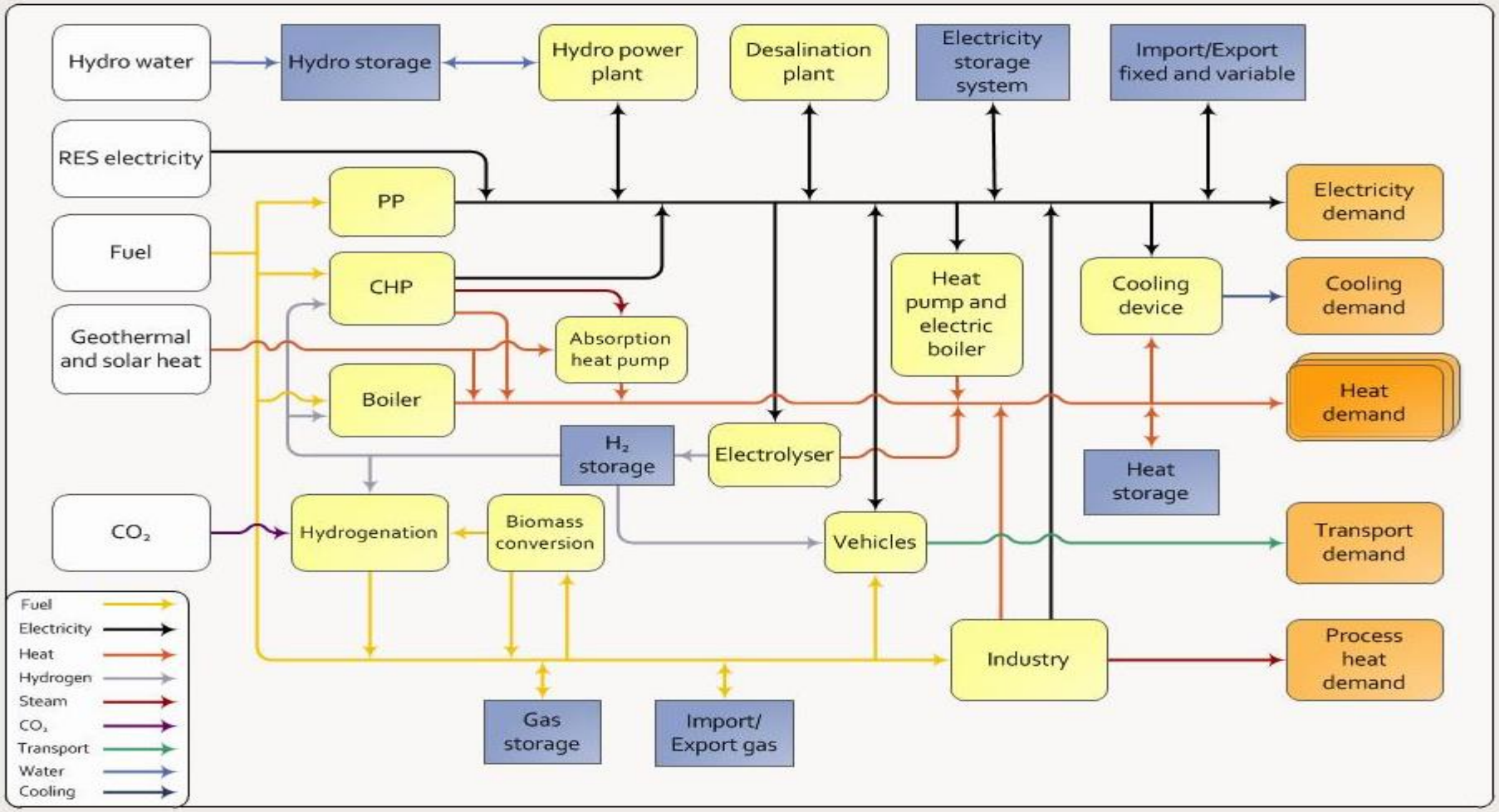
1800 MW heat pumps in district heating (today ca. 25 MW)

850 MW bio-CHP and 3000 MW biogas peak power

20 PJ solar heat (11 mill. m², today 1-2 mill. m2), 19 PJ geotermi

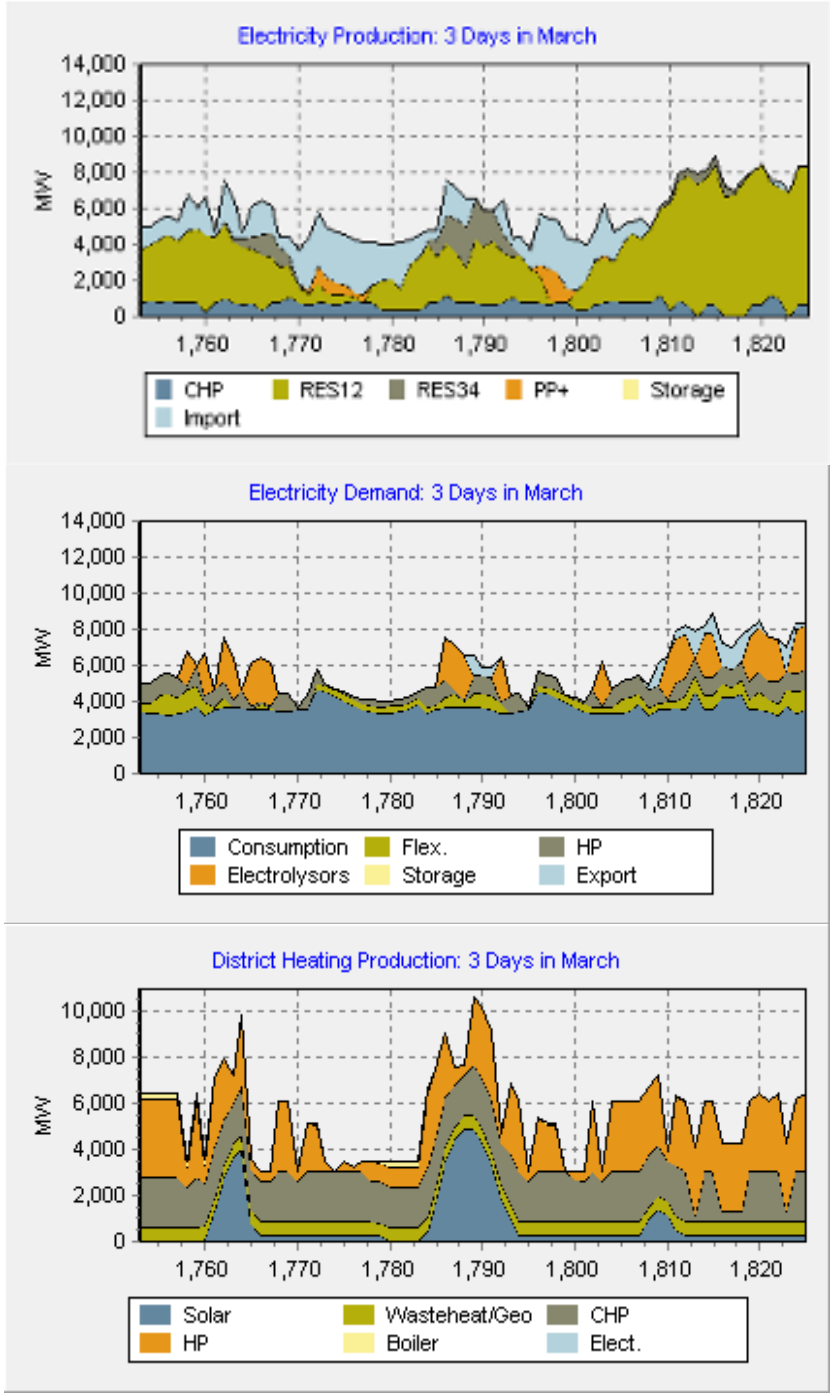
Sustainable biomass – 150 PJ in Danmark

EnergyPLAN model used

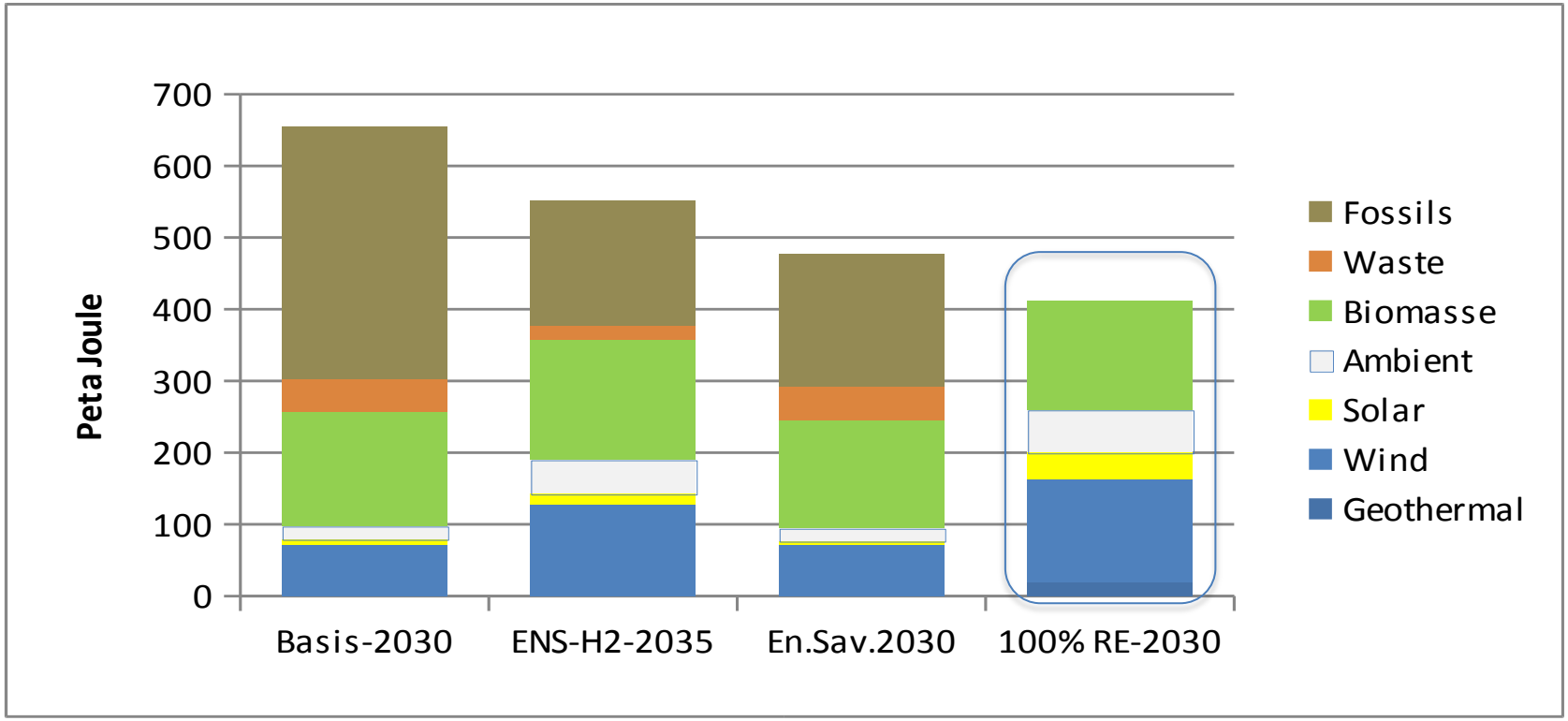


Large Variations in Power Production can be Managed

RES12: Windpower
RES34: Solar PV
Flex: Flexible power demand
HP: Heat pumps
Wasteheat/Geo: geotherm. Heat
CHP: Combined heat & power



Vedvarende Energi



Primary Energy Supply, 2030

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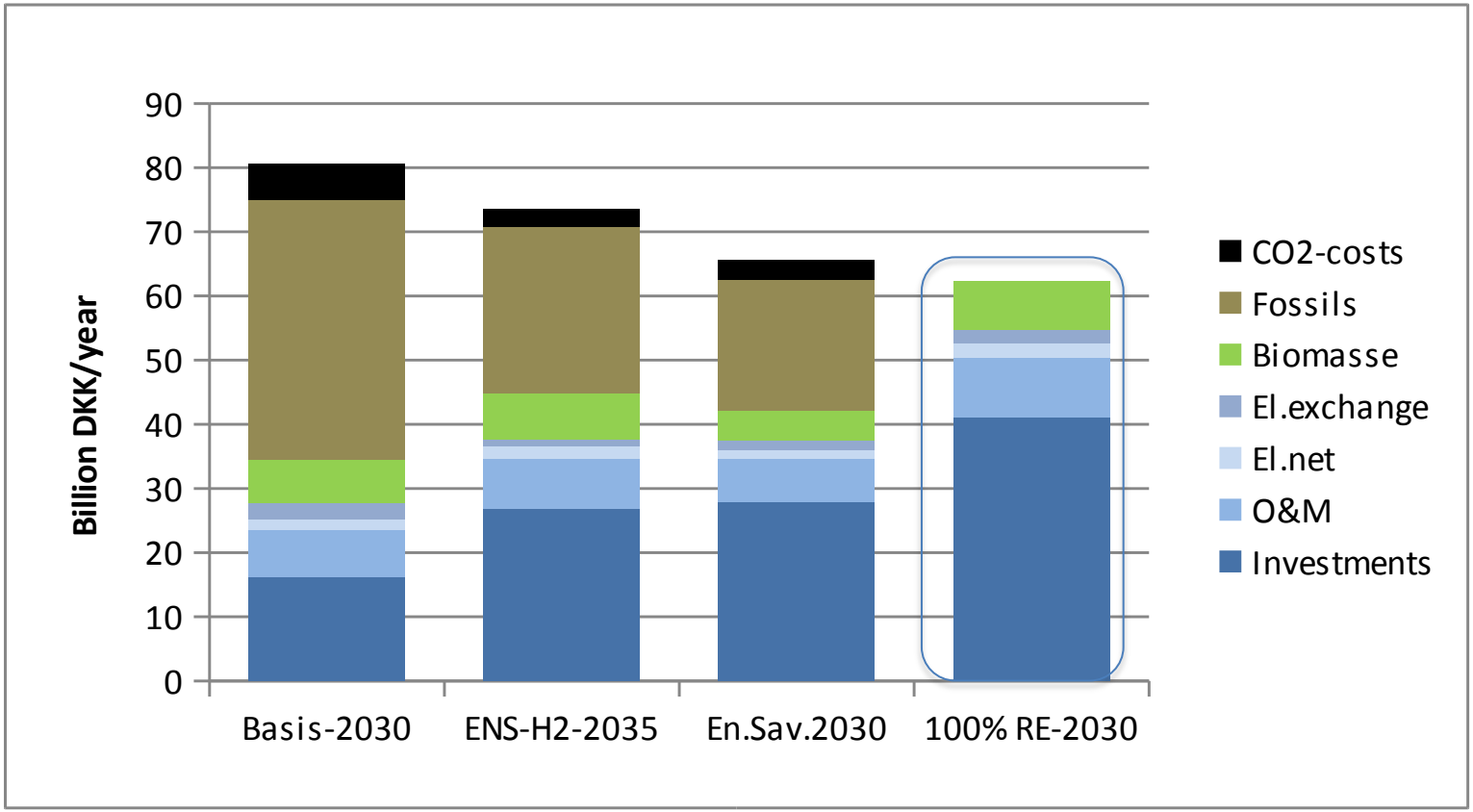

Energy System Costs DK 2030, with Energy Efficiency Invest.

Challenges for the fast transition

- Government target is only 50% in 2030 => slowdown
- Transport is on wrong track, Danish fossil fuel use in transport is growing
- Car use is increasing, use of trains and bycycles stagnating
- Transport minister does not recognise climate problems
- Local windpower opposition, lack of community power
- Little political will in government


Thank you for your attention
Read more:
www.inforse.org/europe