VIDES AIZSARDZĪBAS KLUBS

INFORSE-EUROPE
International Network for Sustainable Energy

Latvijas Zaļā kustība
Latvian Green Movement

International Seminar:
"Exchange of Experience among Baltic Sea Region NGOs and Society in Promotion of Energy Efficiency for Climate Protection and Local Development"

Place: Latvian Energy Efficiency Centre, Jurmala, Latvia
Date: 27 June, 2016

Transition to Renewable Energy and the Important Role of Changing Building Energy Use

By Gunnar Boye Olesen
SustainableEnergy, Denmark & INFORSE-Europe

The Seminar was organised in the framework of a Baltic Sea Region NGO Cooperation Project.
More on the project: http://www.inforse.org/europe/se_buildings_project.htm

With support from

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Danish Transition to Renewable Energy and the Important Role of Changing Building Energy Use.

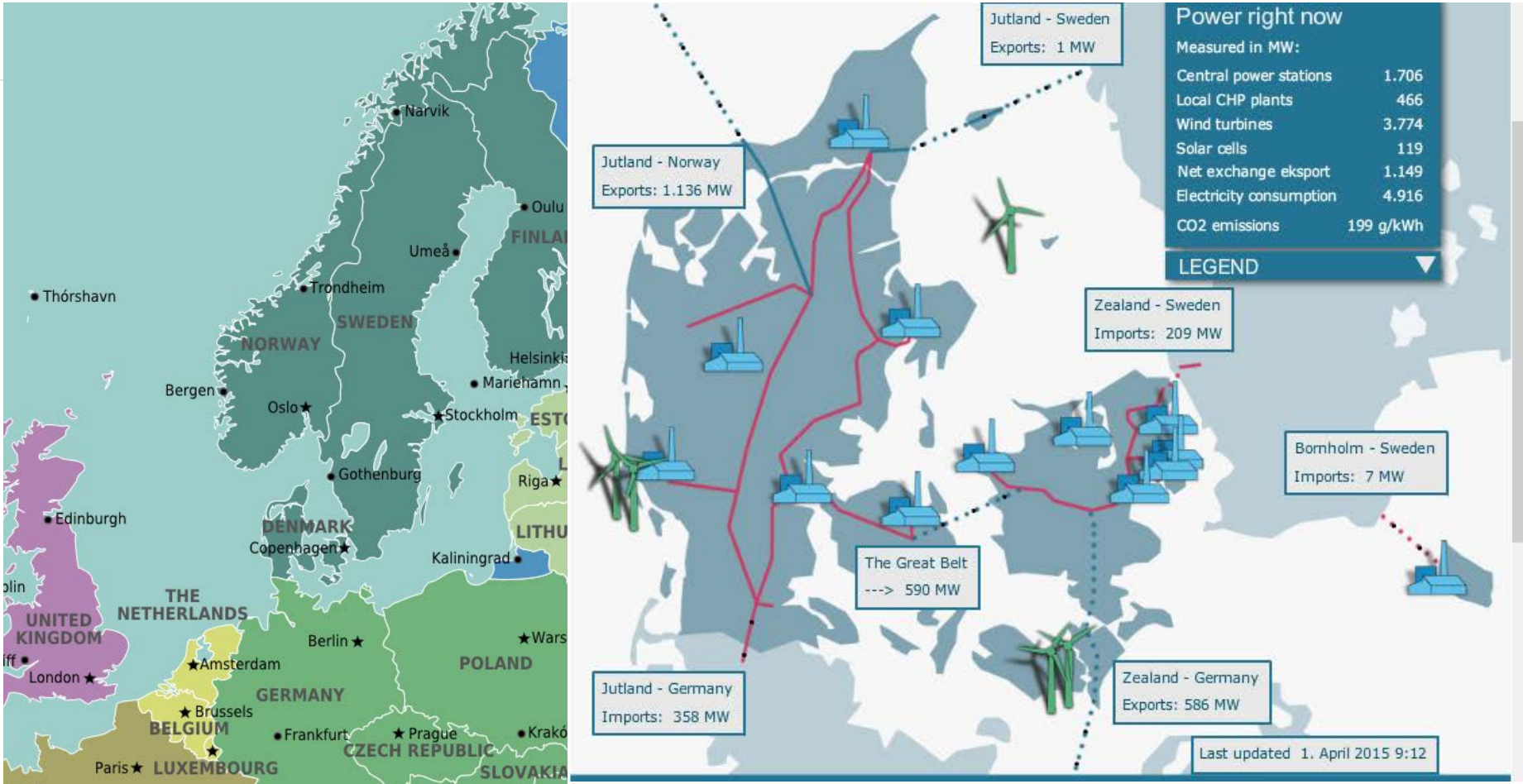
Gunnar Boye Olesen, SustainableEnergy & INFORSE

International seminar: Baltic Sea Region NGOs and Society in Promotion of Energy Efficiency for Climate Protection and Local Development",
27th June, 2016, Jurmala, Latvia

With support from

Denmark,

5.5 mill people, 44,000 km^2



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Denmark has targets of 100% renewable energy economy-wide in 2050 and in 2020 more than 50% of Danish power will be windpower

SustainableEnergy and Friends of the Earth Denmark promotes 100% renewable energy economy-wide by 2030
– 14 years from now

Danish Transition to Sustainable Energy

100% renewable energy in 2030

- 1.5-2°C Climate target require fast action, such as greenhouse gas neutrality by 2050 – and some countries has to lead and decarbonise faster
- The transition will also give cleaner air, employment, security of supply
- Transition to 2030 is realistic for Denmark
- Good economy, if we also save energy and make transport transition

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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

Transition Sector by Sector

- Buildings (housing and service sectors)
- Industry, agriculture
- Transport
- Renewable energy supply

The Sustainable Energy Path

Increase end-use Energy Efficiency

Limited growth in energy services

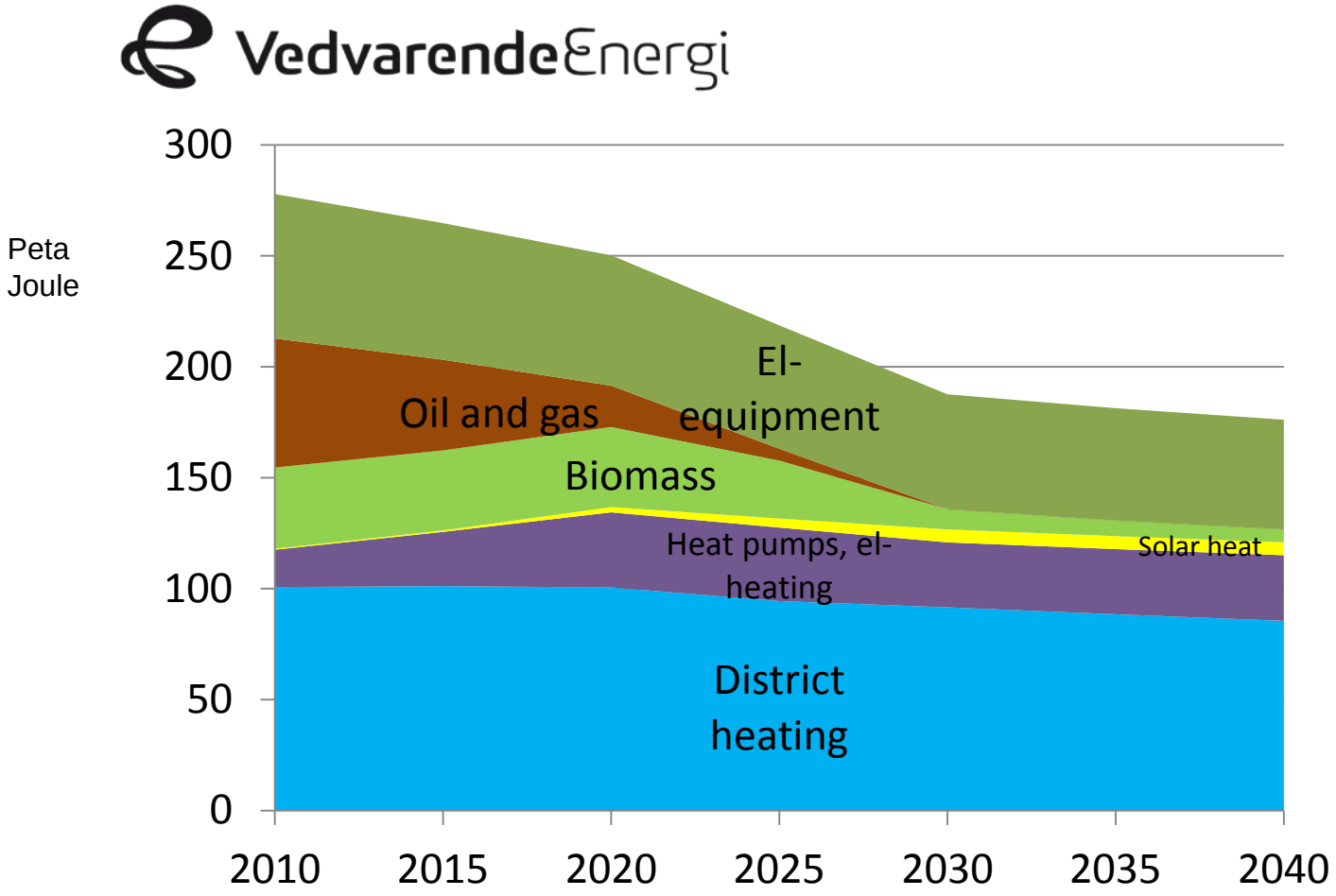
Efficient energy supply

Renewable Energy

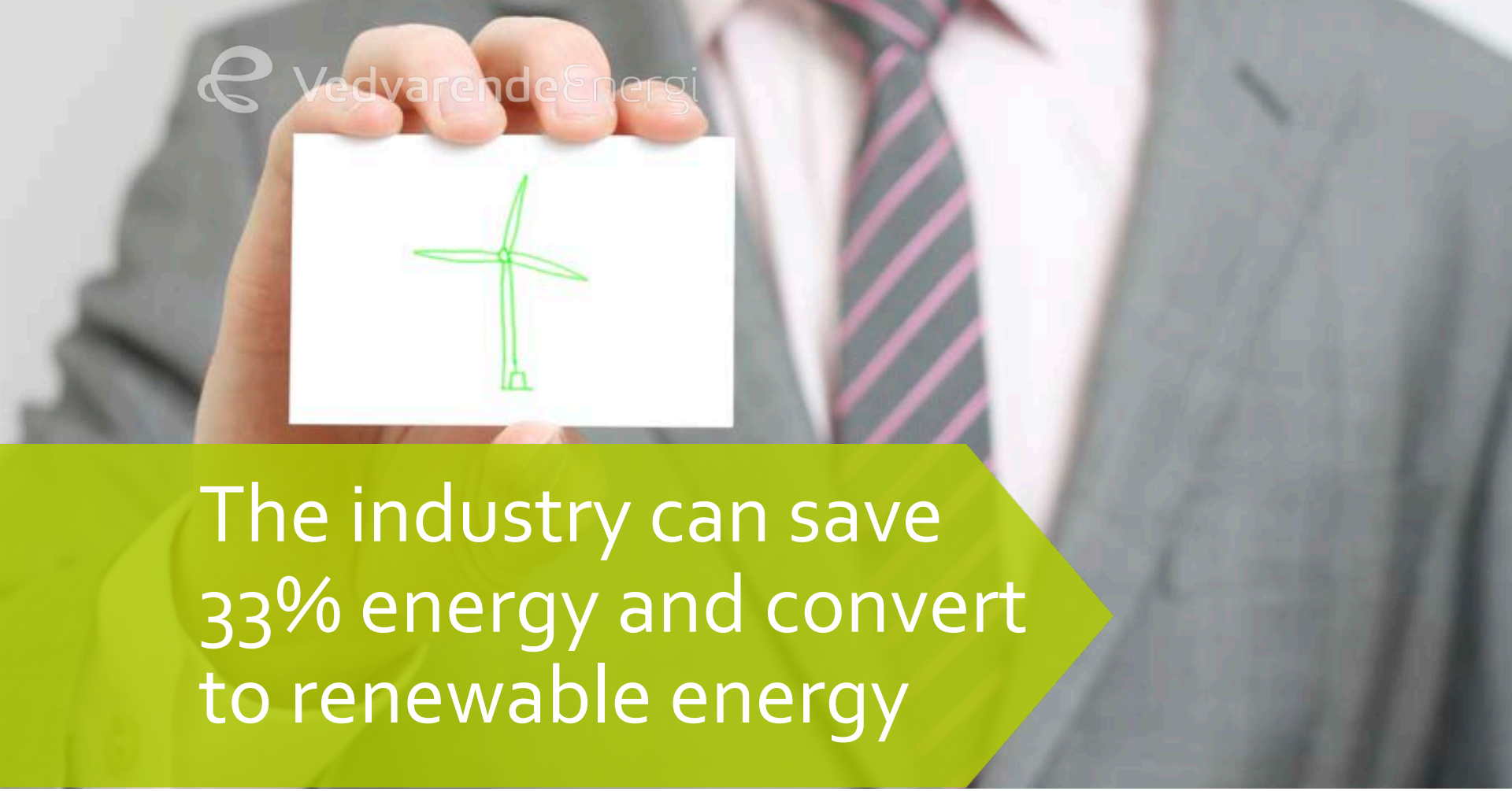
Intellligent & flexible energy systems

We can save 40% energy in buildings

- High requirements for new buildings – and quality control of construction & renovations
- Energy renovations – old buildings to reach 2010-standard + some air heat recovery (balanced ventilation with heat exchangers)



Transition of housing and service sectors



The industry can save 33% energy and convert to renewable energy

Today the industry invest with only 3-5 years simple pay-back

- Vi propose that companies plan a transition to renewables in 10-15 years
- Vi propose state guarantees for loans for energy efficiency

Transition to Intelligent transport

- Transport has costs, we shall use it intelligently
- Electric cars will be cheaper than diesel from 2020, if we use them
- But for busy routes railways are cheaper – and bicycles are cheapest
- We should change transport investments from motorways to rail and bicycles , -and use car-sharing

Expand renewable energy

11000 MW windpower in 2030, half on land (today 5000 MW)

4000 MW solar PV in 2030 (today 900 MW)

1800 MW heat pumps in district heating (today ca. 10 MW)

850 MW bio-CHP and 3000 MW biogas peak power

20 PJ solar heat (11 mill. m^2 = 1100 ha), 19 PJ geotermi

Sustainable biomass – 150 PJ in Danmark

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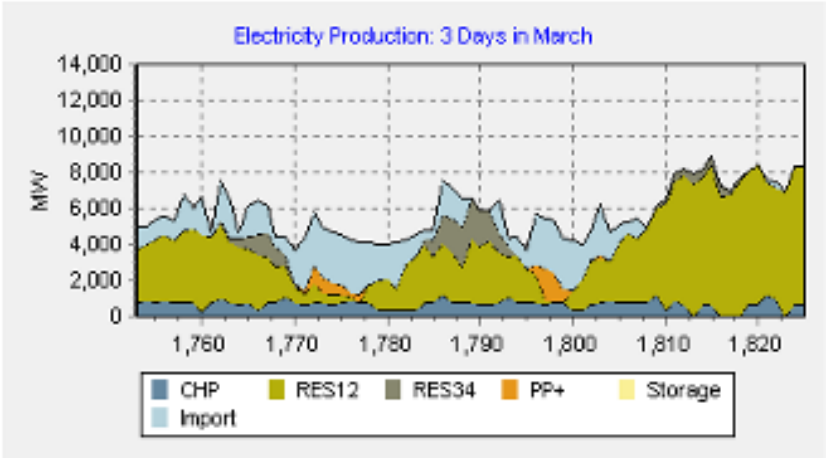
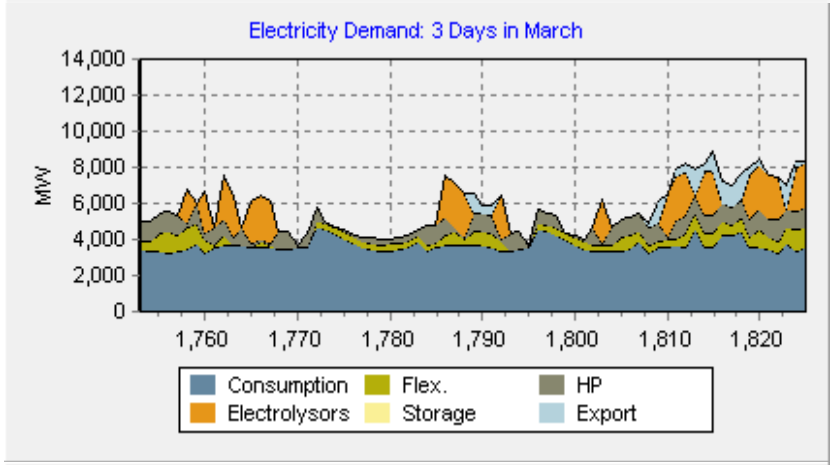
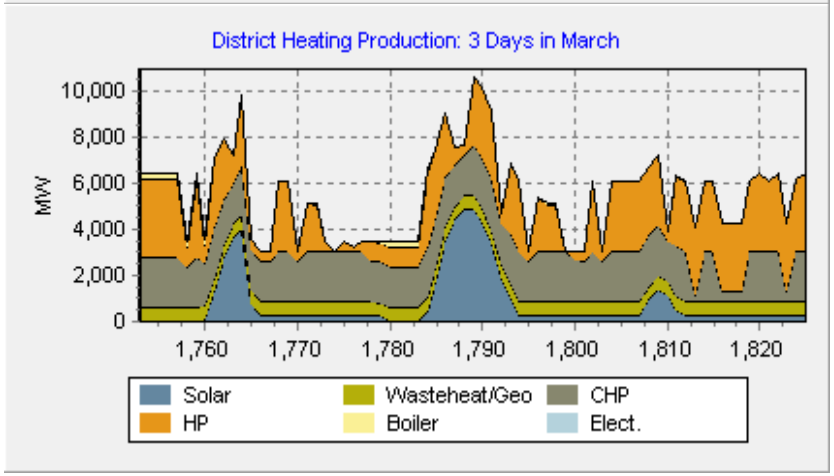
Large variations in power flows

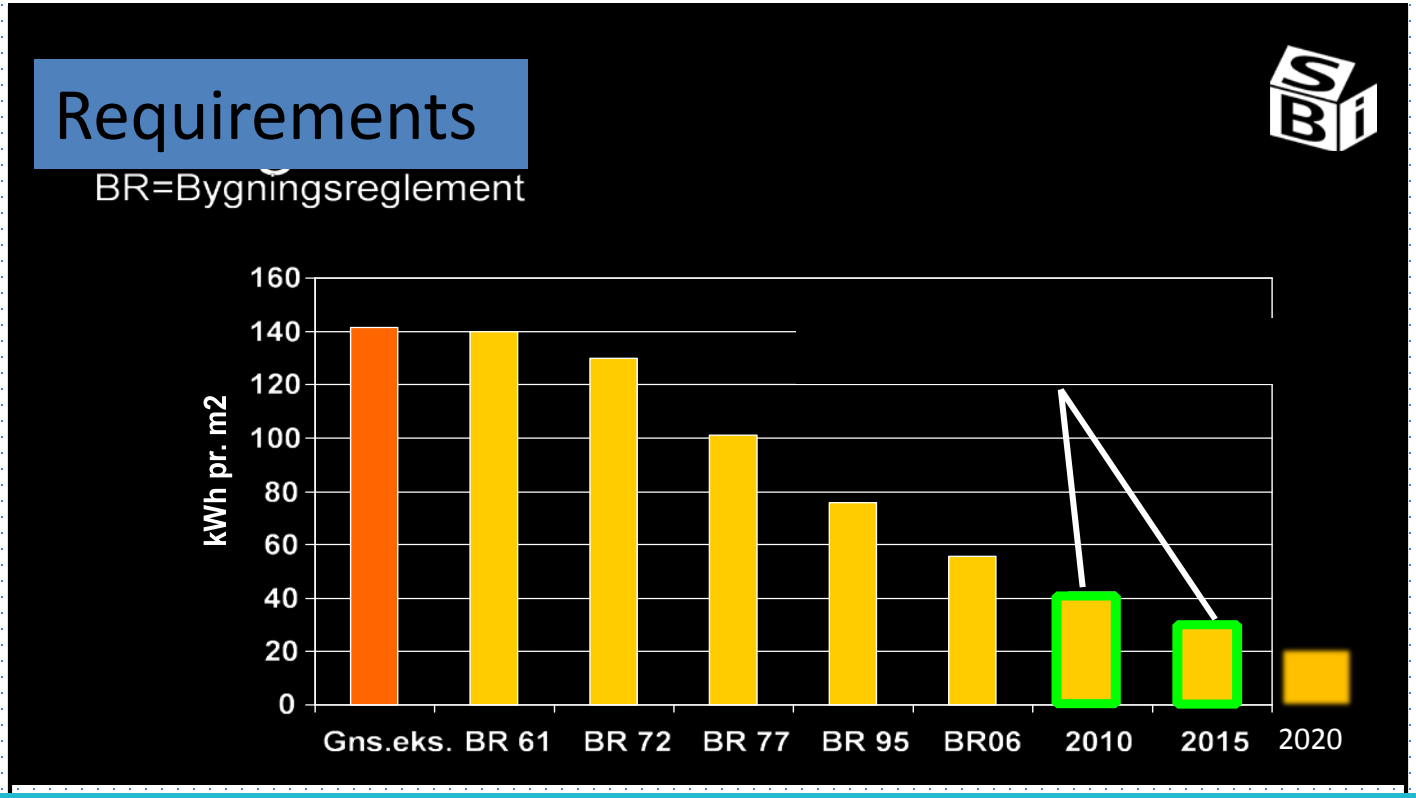
RES12: Windpower
RES34: Solar PV
Flex: Flexible power demand
HP: Heat pumps
Wasteheat/Geo: geotherm. Heat
CHP: Combined heat & power





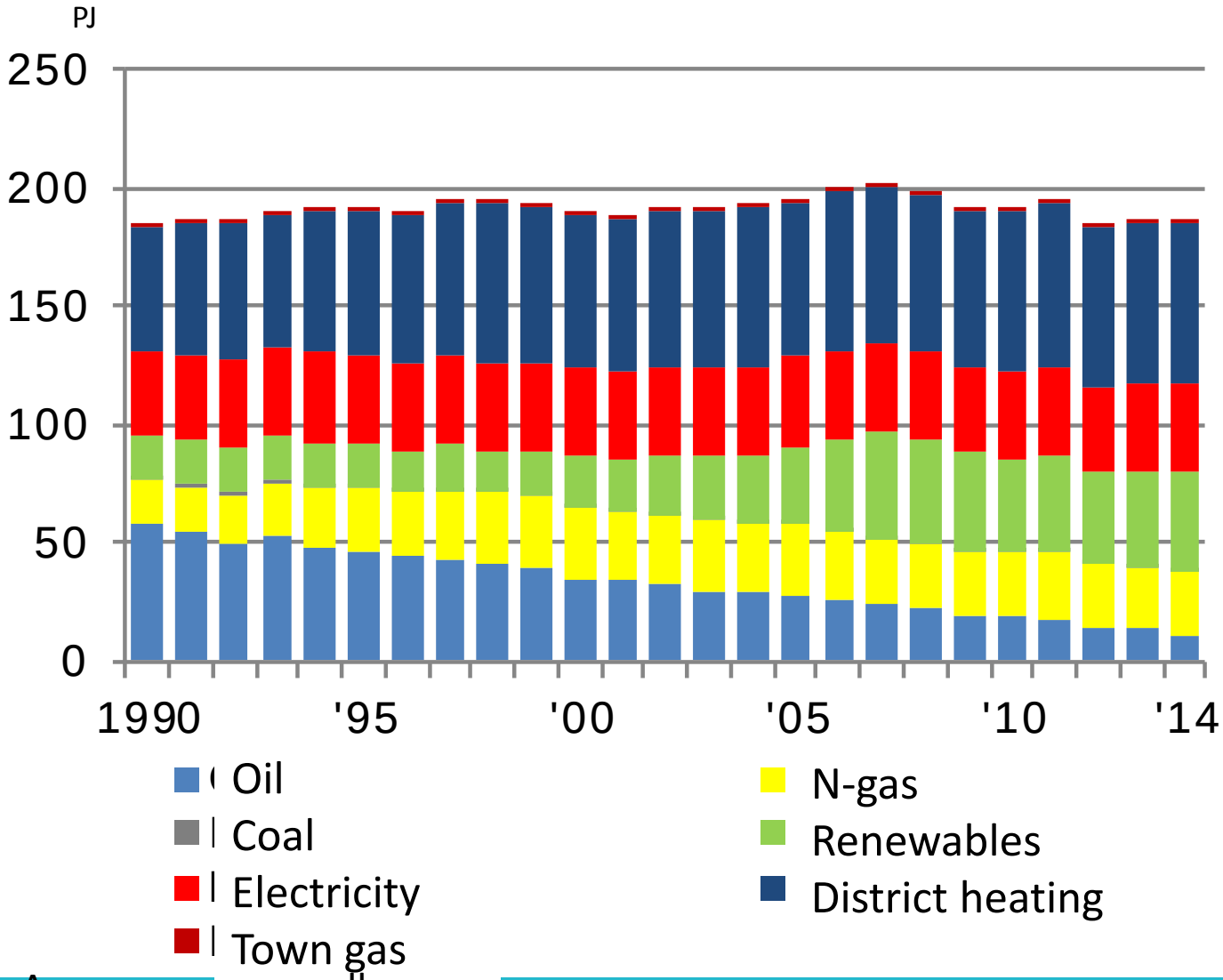


Energy Efficiency of DK Buildings



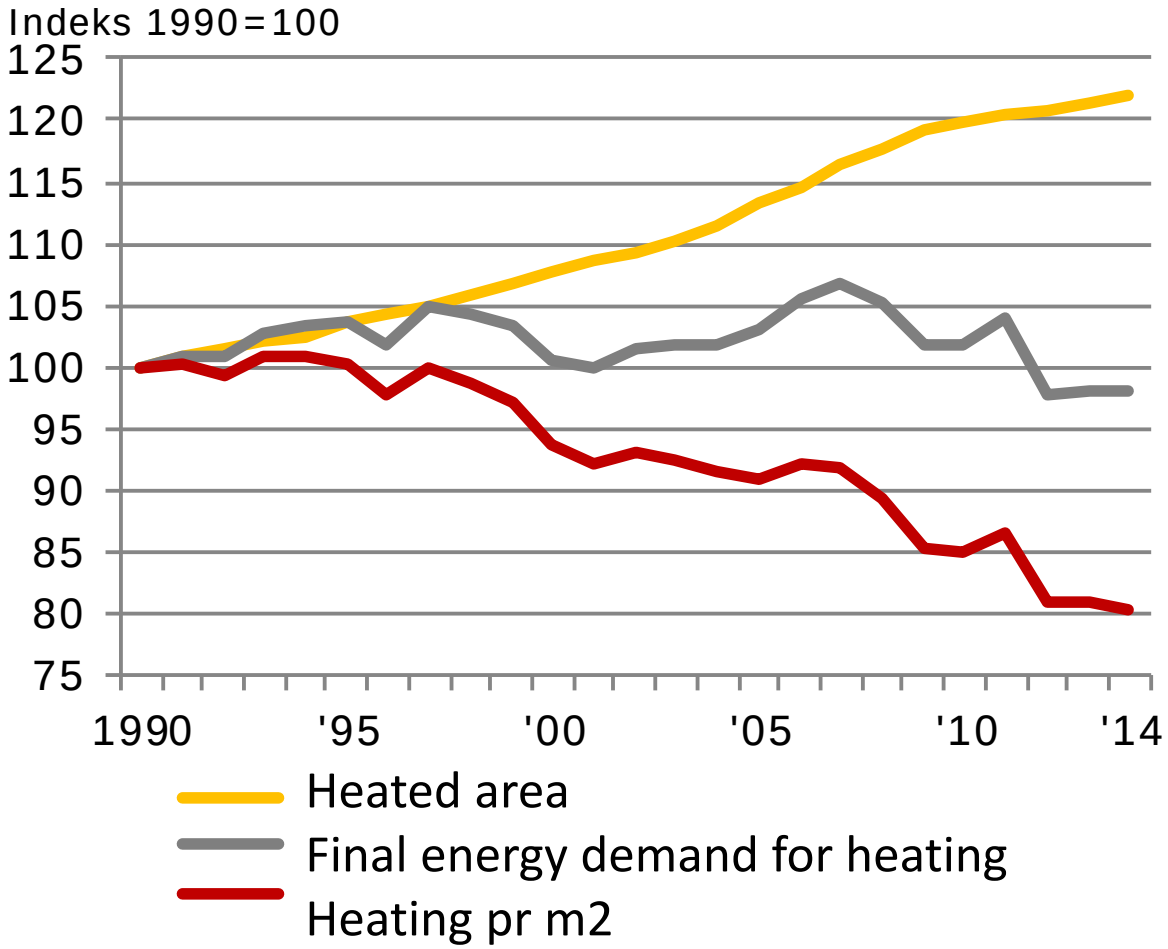
- Increased requirements
- Free information, energy labels, requirements for energy suppliers

Household use of energy,
corrected for annual weather variations



Danish Energy Agency, www.ens.dk

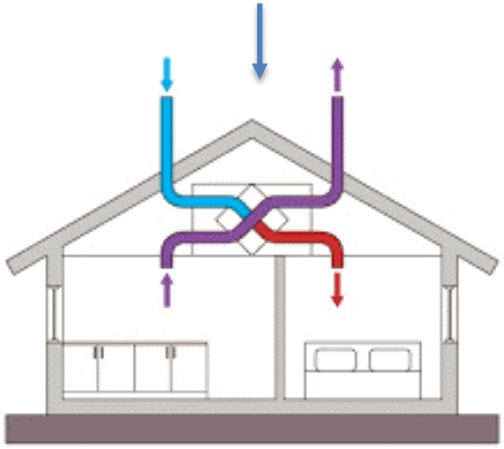
Energy use for heating in households, corrected for annual weather variations

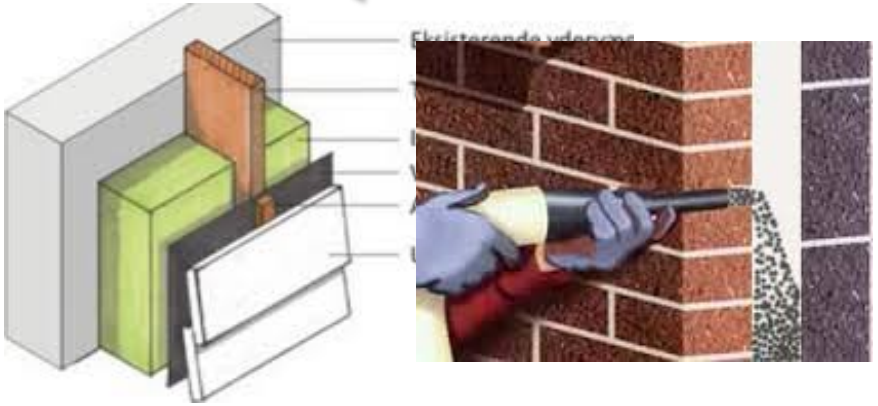


Danish Energy Agency, www.ens.dk

Heating efficiency measures

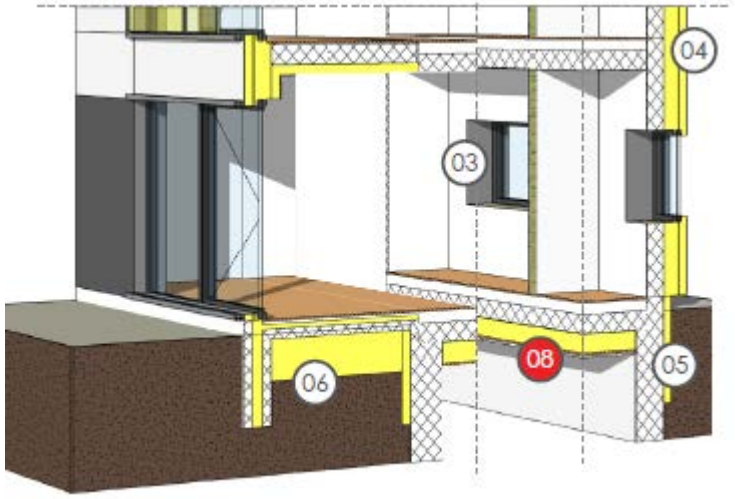
- Draft proofing (tightning)
- Pipe insulation and improved piping
- Regulation (thermostats etc.)
- Low energy windows (IR coating, good frames)
- Roof and floor insulation
- Cavity wall insulation or wall insulation
- Balanced ventilation w. heat exchanger





”Passive house” renovation

bjerg arkitektur



Better Home (Bedre bolig) Plan

Example

Boligtype	Fritliggende enfamilieshus
Byggeår	1954
Opvarmet areal (m2)	150
Energikilde	Fyringsgasolie

Consumption

Fuel: Heating oil

Demand	2.274 Kilo/år
Price	13,87 kr./Kilo
Total cost	33.044 kr./år
Fixed costs	1.500 kr./år
kWh price	1,17 kr./kWh
CO2 emissions	7,20 ton CO_2/år

Better Home - Improvement catalogue

1. Replace oil boiler with wood pellet boiler and solar heating: Investment 102,000 DKK, Savings 20,700 DKK/year (alternatives: Heat pump, evt. district heating),
2. Cavity wall insulation: Investment 30,000 DKK, Saving 5,600 DKK/year
3. Loft insulation: Investment 67,900 DKK, savings 3,100 DKK/year
4. Extra layer on windows: Investment 88,400 DKK, savings 3,300 DKK/year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Thank you
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Sustainable Biomass 2030 for DK