Getting Ready for Zero Emissions and 100% Renewable Energy: Plans and Scenarios to Pave the Way for the Transition

10 December, 2015 - 11:15-12:45 - Room 2

Side event to the UNFCCC COP21, Climate Generation Area, Paris, France

National and EU-wide Transitions to 100% Renewable Energy With Good Economy – Case of Denmark

By Gunnar Boye Olesen
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The event was organised by Nordic Folkecenter for Renewable Energy (Denmark) & NegaWatt (France) in cooperation with INFORSE, Track 0, Centre for Alternative Technology –CAT (UK).
The event was part of the "Climate Generation Area" Conference organised by the French Government parallel to the UNFCCC COP21 - www.cop21.gouv.fr/en/les-espaces-generations-climat/

National and EU-wide Transitions to 100% Renewable Energy With Good Economy – Case of Denmark

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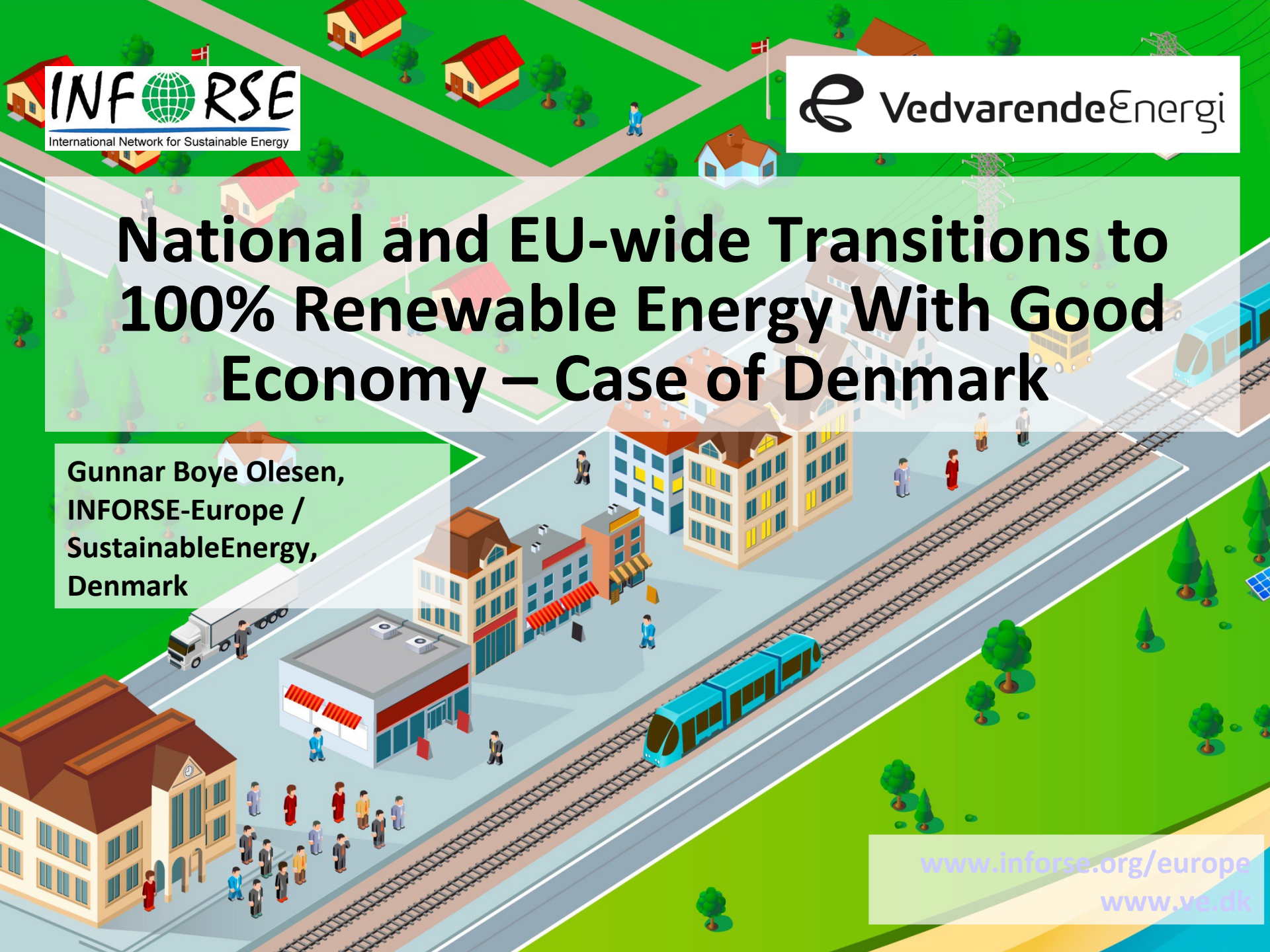

www.inforse.org/europe
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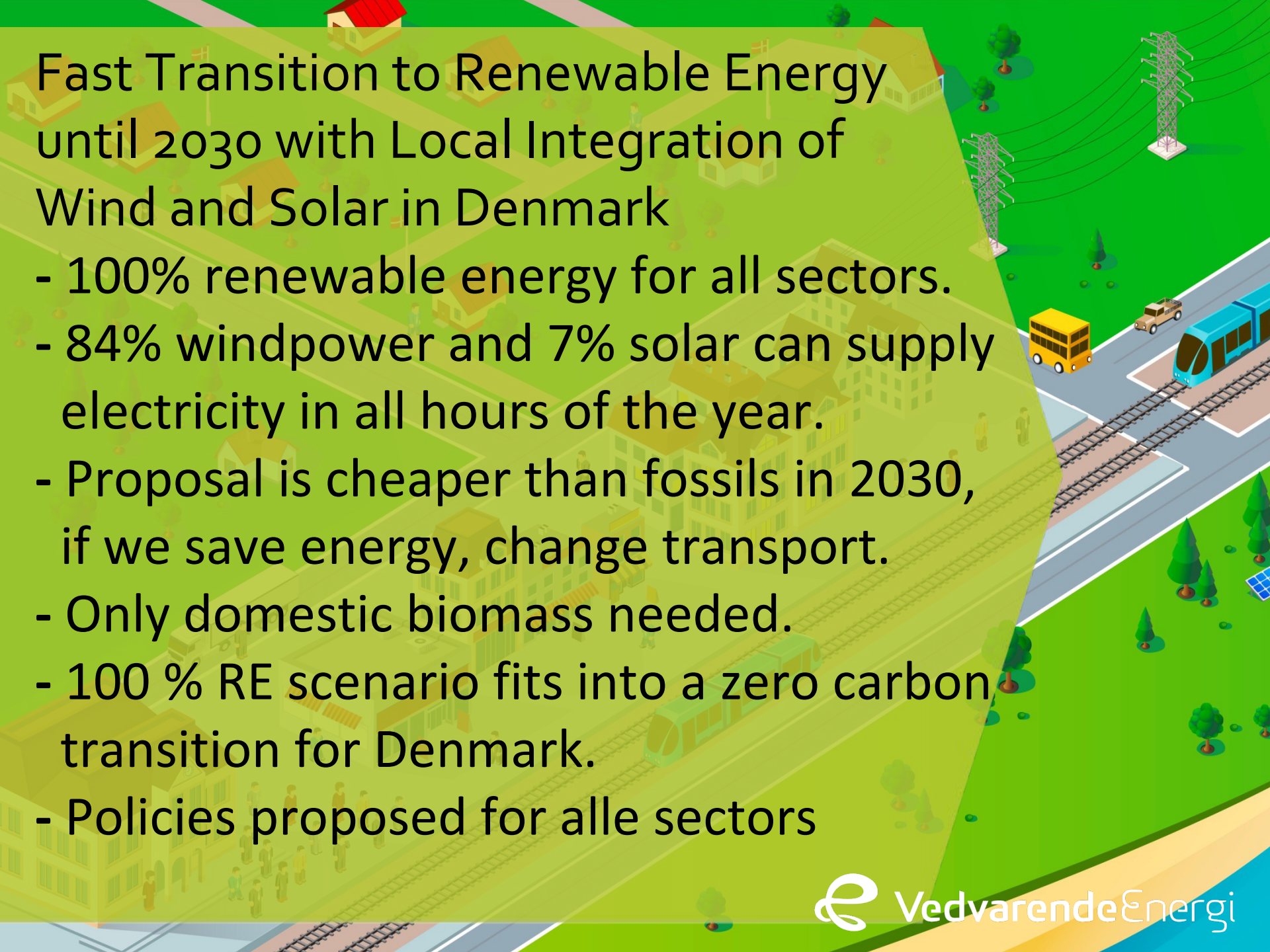
National and EU-wide Transitions to 100% Renewable Energy

- Vision for EU-27, 2040
  - Belarus, 2045
  - Bulgaria, 2040
  - **Denmark, 2030**
  - Estonia, 2040
  - Hungary, 2040
  - Latvia, 2040
  - Lithuania, 2040
  - Romania, 2040
- UK ZeroCarbonBritain, 2035
  - Ukraine, 2050

INFORSE
International Network for Sustainable Energy

www.inforse.org/europe/Vision2050.htm



Fast Transition to Renewable Energy until 2030 with Local Integration of Wind and Solar in Denmark

- 100% renewable energy for all sectors.
- 84% windpower and 7% solar can supply electricity in all hours of the year.
- Proposal is cheaper than fossils in 2030, if we save energy, change transport.
- Only domestic biomass needed.
- 100 % RE scenario fits into a zero carbon transition for Denmark.
- Policies proposed for alle sectors

VedvarendeEnergi

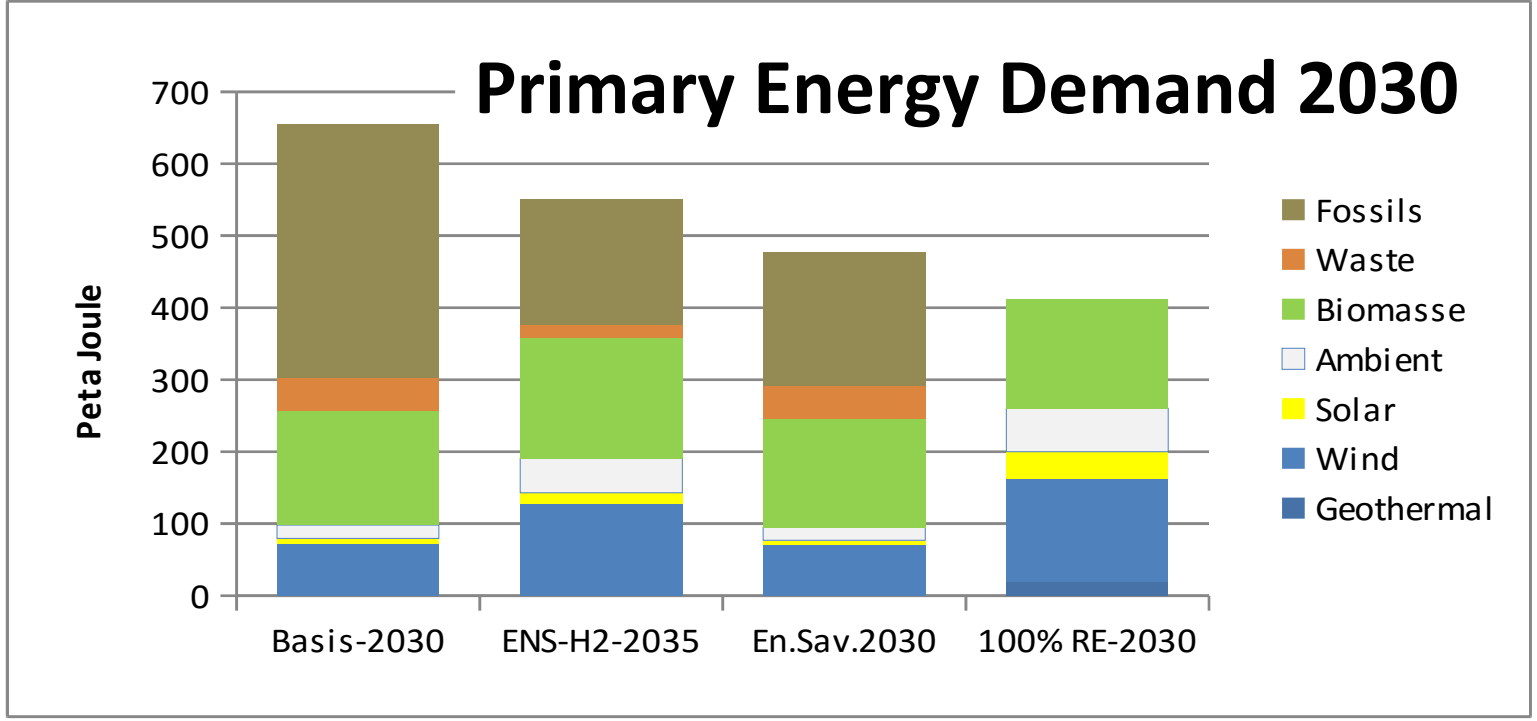
- Windpower on land and near shore with local participation & benefits

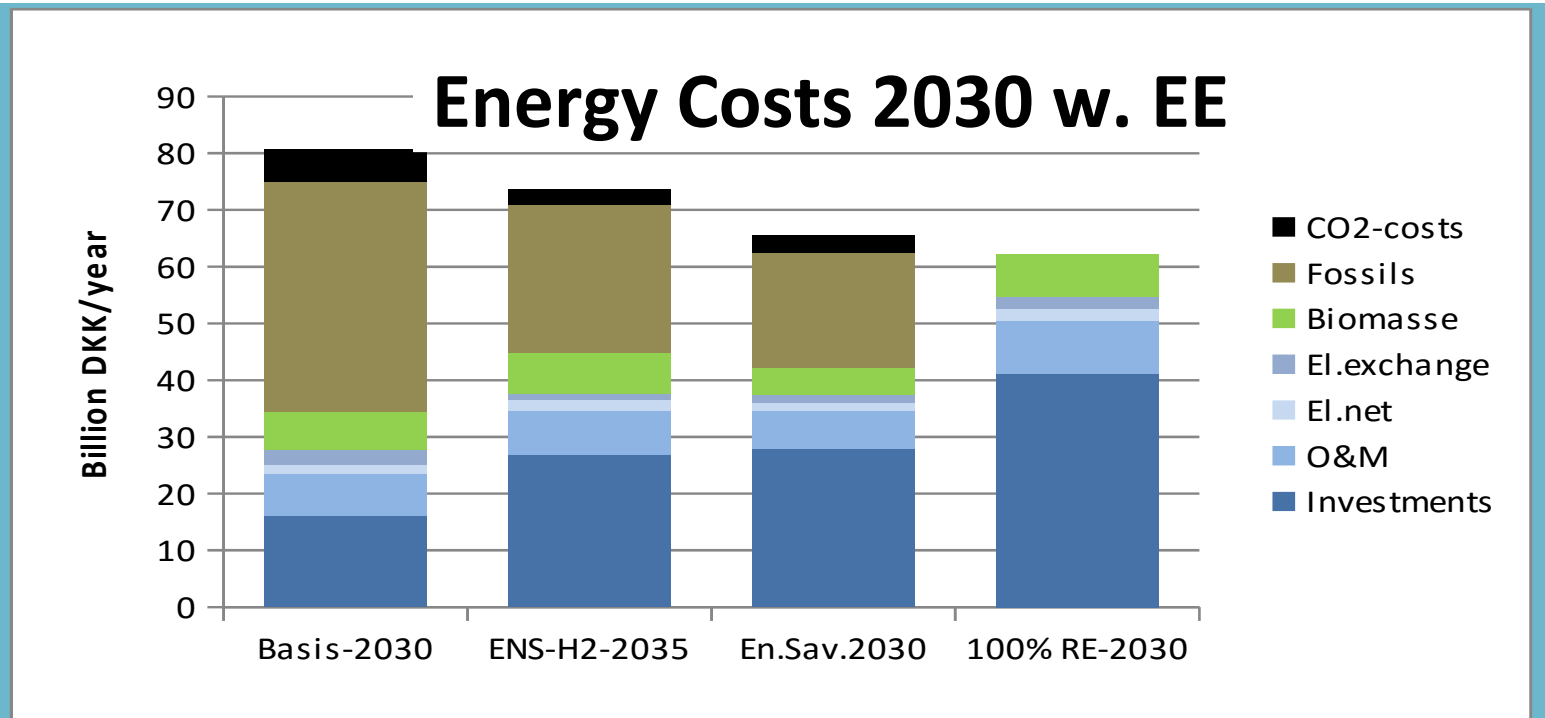
(offshore is more expensive)

- More district heating
- Energy efficiency in industry
- Transport transition with less commuting, more public transport
- Fuel shift to electricity + H_2

General assumptions used

VedvarendeEnergi


Primary Energy Demand 2030
Peta Joule
700
600
500
400
300
200
100
0
Basis-2030
ENS-H2-2035
En.Sav.2030
100% RE-2030
Fossils
Waste
Biomasse
Ambient
Solar
Wind
Geothermal


Energy Costs 2030 w. EE
Billion DKK/year
90
80
70
60
50
40
30
20
10
0
Basis-2030
ENS-H2-2035
En.Sav.2030
100% RE-2030
CO2-costs
Fossils
Biomasse
El.exchange
El.net
O&M
Investments

Why is 100% renewable cheaper in 2030?

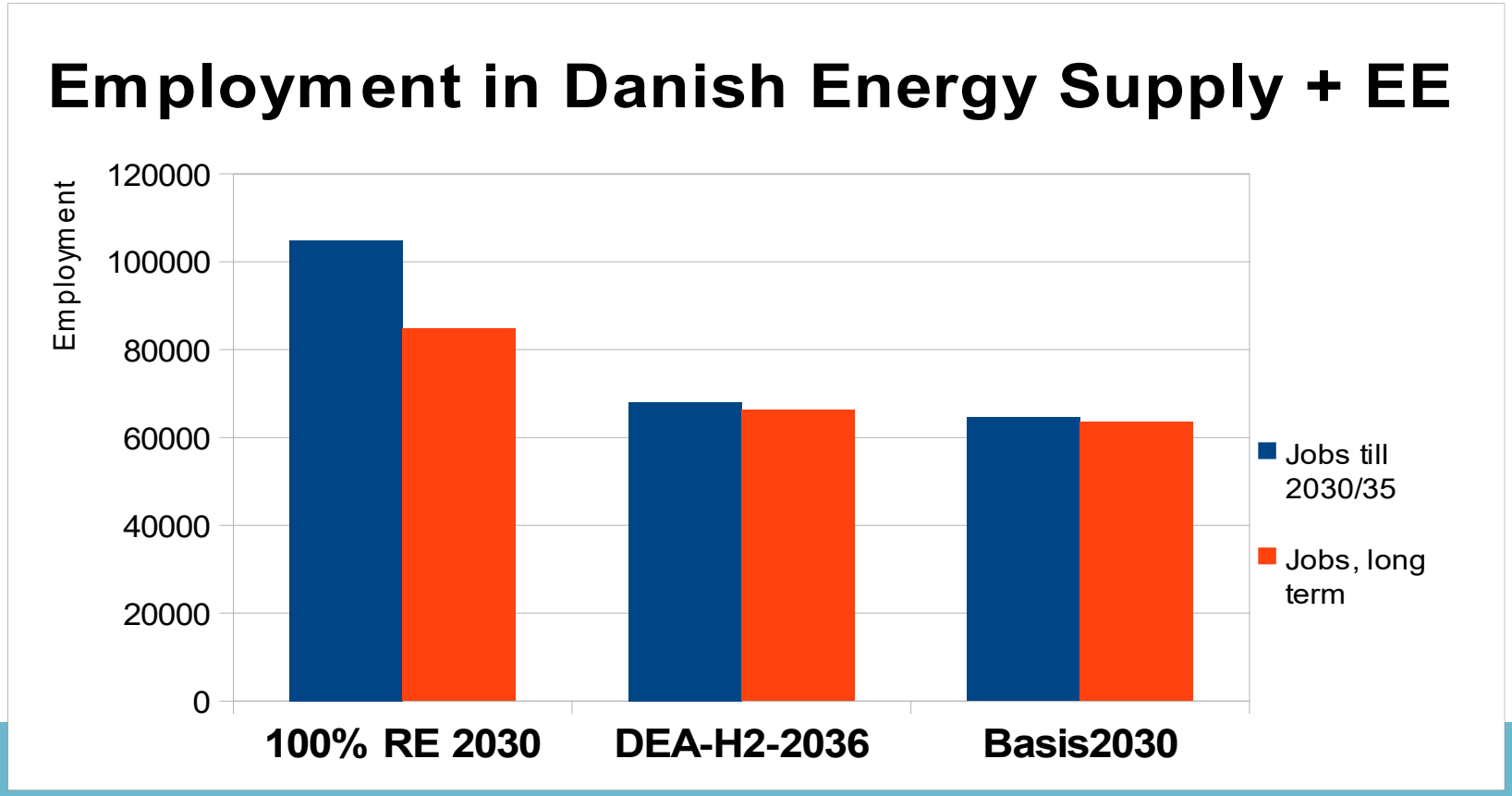
(Savings by 100% renewable energy compared with partly transition (Danish Energy Agency Scen. 20305)

LESS FUEL COSTS BUT HIGHER INVESTEMENTS AND O&M

Details:

Less transport	0.83 bill €/y.
Phase-out fossils for transport	0.93 bill. €/y (oil at 90$/barrel)
Less off-shore wind	0.09 bill. $/y
More energy efficiency	- 0.27 bill. $/y
Other	- 0.33 bill. $/y (less grids, oth.)
Total savings of 100% RE	**1.2 bill DKK/y**

30,000 New Jobs During Transition



Fast transition to renewable energy: 30-37.000 extra jobs till 2030