

Welcome to Denmark - State of Green

i-Sustain delegation
18 September 2017





The background features a stylized map of Europe on crumpled paper. A dotted white line path winds across the map, connecting various cities and regions. Labels include Trondheim, Molde, Bergen, NO3, NO5, NO1, NO2, Sundsvall, SE2, SE3, Stockholm, SE4, Århus, Malmö, Copenhagen, DK1, DK2, Tallinn, EE, Riga, LV, and LT. A green starburst logo is visible in the bottom right corner of the map area.

About State of Green

State of Green

Join the Future. Think Denmark

What is State of Green?

State of Green is a public-private partnership founded by:

The Danish Government
The Confederation of Danish Industry
The Danish Energy Association
The Danish Agriculture & Food Council
The Danish Wind Industry Association

H.R.H. Crown Prince Frederik of Denmark is patron of State of Green

State of Green's commercial partners:



Premium partners



Associate partners



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Sharing Denmark's green know-how

STATE OF GREEN

QUICK START

Your easy guide to relevant news, profiles and solutions. Begin by choosing an area of interest:



ENERGY EFFICIENCY



HEATING & COOLING



INTELLIGENT ENERGY



WIND POWER



SOLAR & OTHER RENEWABLES



BIOENERGY



WATER



CLIMATE ADAPTATION



ENVIRONMENT & RESOURCES



SUSTAINABLE TRANSPORTATION



State of Green Tours

Technical visits for foreign decision makers.

Events

Export promotions, exhibition stands, conferences etc.

Website

The world's gateway to Denmark's green solutions and know-how.

House of Green

Interactive visitor's center for foreign delegations.

Press & Communication

International media relations and news publication.

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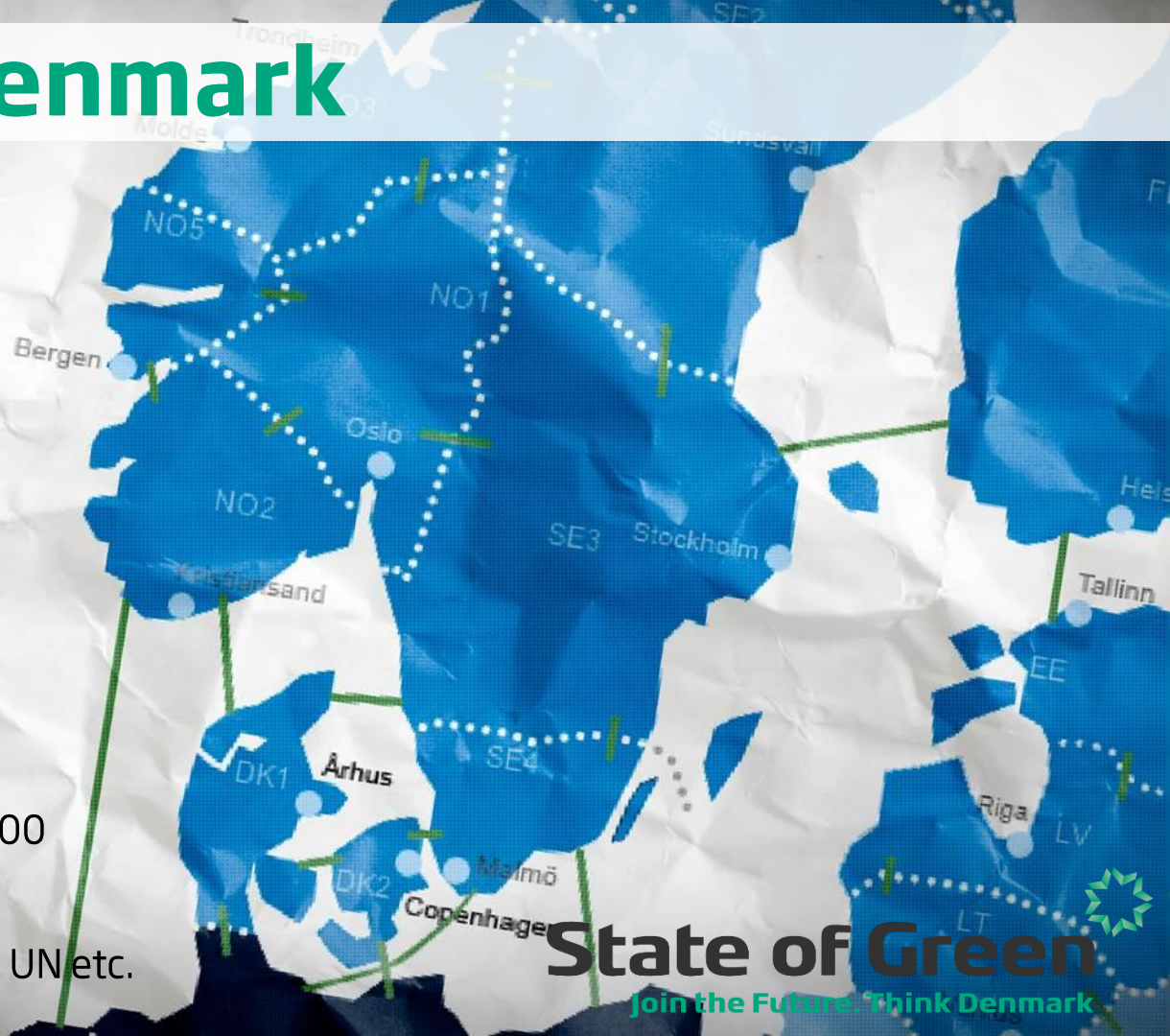
Towards 2050

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Facts about Denmark

- 5.6 million people
- Area: 43,000 km²
- Land use:
 - Agriculture 66 %
 - Forest 16 %
 - Lakes, meadows and marsh 7 %
 - Urban zone/infrastructure 10 %
- Total coastline: 7,300 km
- Constitutional monarchy
- GDP per capita (2015): EUR 43,500
- The world's happiest nation several times according to OECD, UN etc.



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The Danish point of departure

- 1973-74 oil crisis
- 99% dependent on imported energy
- Pollution caused by fossil fuels
- Growing public concerns about environmental policy



A new direction

State of Green - The Political Framework



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| <p>1971 The first environmental legislation in Denmark, the Environmental Protection Act, was passed by the Folketing.</p> <p>1972 The Environmental Protection Act was amended.</p> <p>1973 The Environmental Protection Act was amended.</p> <p>1974 The Environmental Protection Act was amended.</p> | <p>1982 The Environmental Protection Act was amended.</p> <p>1984 The Environmental Protection Act was amended.</p> <p>1985 The Environmental Protection Act was amended.</p> | <p>1989 The Environmental Protection Act was amended.</p> <p>1990 The Environmental Protection Act was amended.</p> <p>1990 The Environmental Protection Act was amended.</p> | <p>1996 The Environmental Protection Act was amended.</p> <p>1996 The Environmental Protection Act was amended.</p> | <p>2002 The Environmental Protection Act was amended.</p> <p>2003 The Environmental Protection Act was amended.</p> <p>2004 The Environmental Protection Act was amended.</p> | <p>2007 The Environmental Protection Act was amended.</p> <p>2007 The Environmental Protection Act was amended.</p> <p>2007 The Environmental Protection Act was amended.</p> | <p>2010 The Environmental Protection Act was amended.</p> <p>2011 The Environmental Protection Act was amended.</p> <p>2011 The Environmental Protection Act was amended.</p> |
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green business

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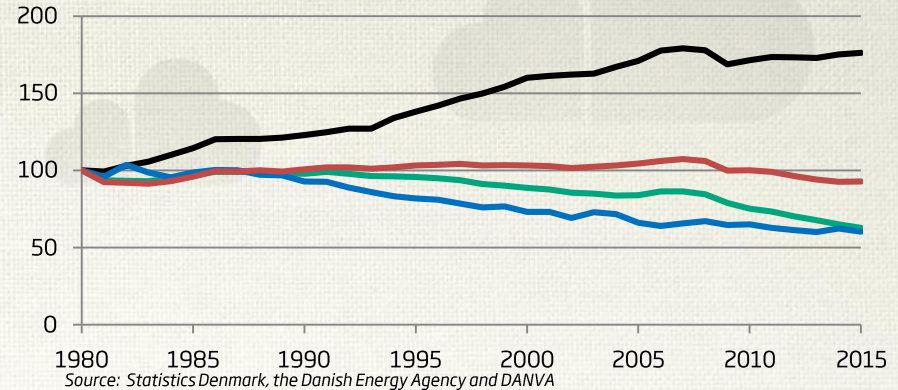
The Danish example (1980 = index 100)

Our economy has grown by more than 70% since 1980

Our energy consumption has remained the same

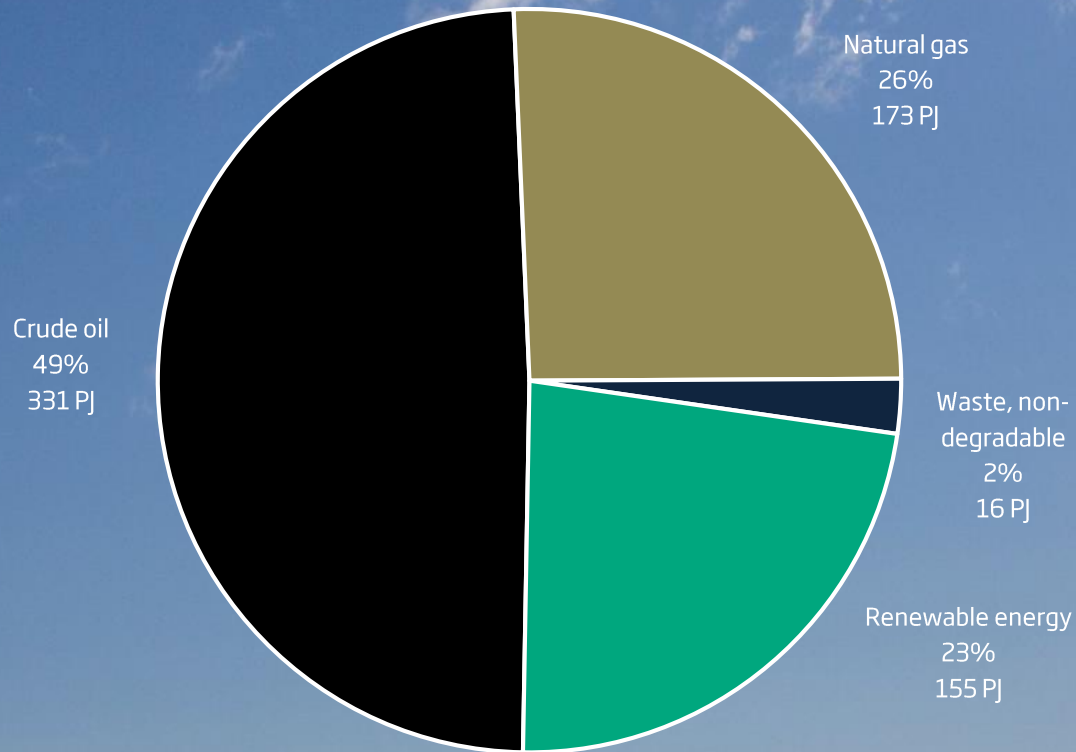
While CO₂ emissions have been reduced

And total water consumption has been reduced by 40%



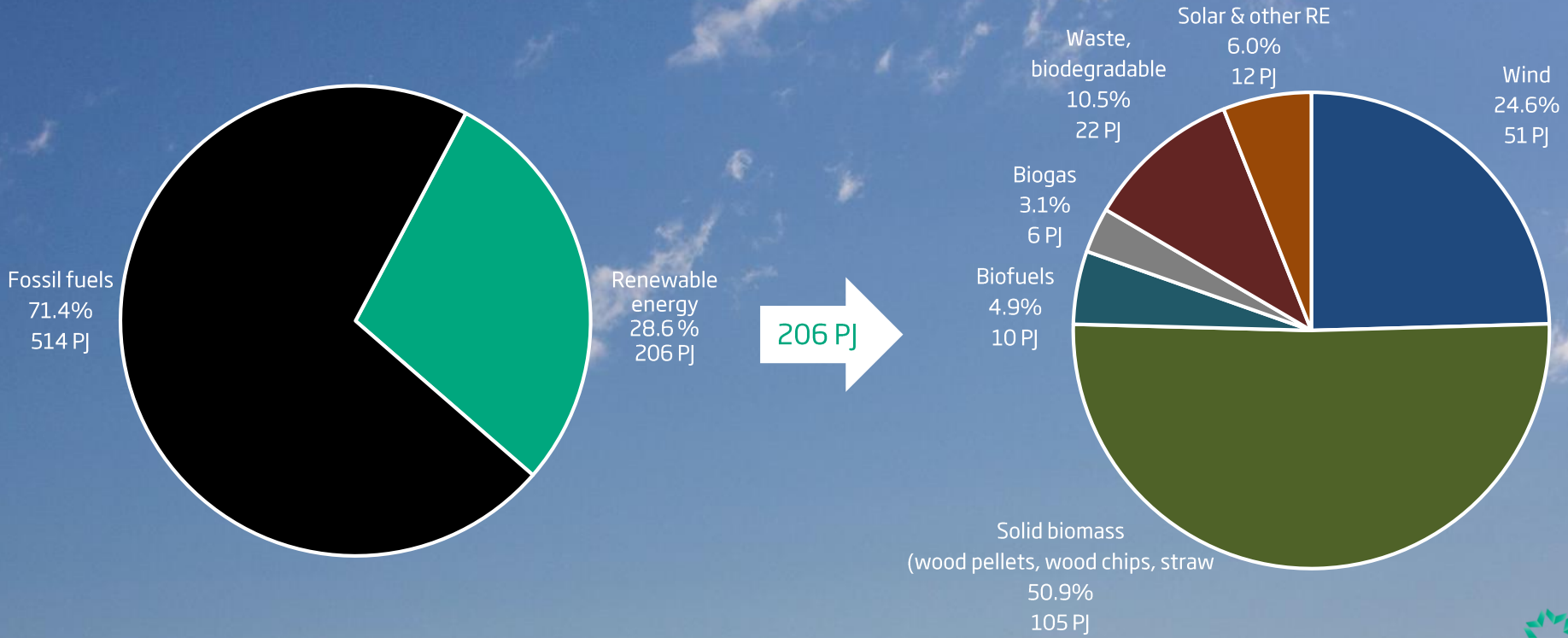
- GDP in real terms
- Gross energy consumption, climate adjusted
- CO₂ emissions, adjusted
- Total water consumption

Denmark's Energy Production 2015



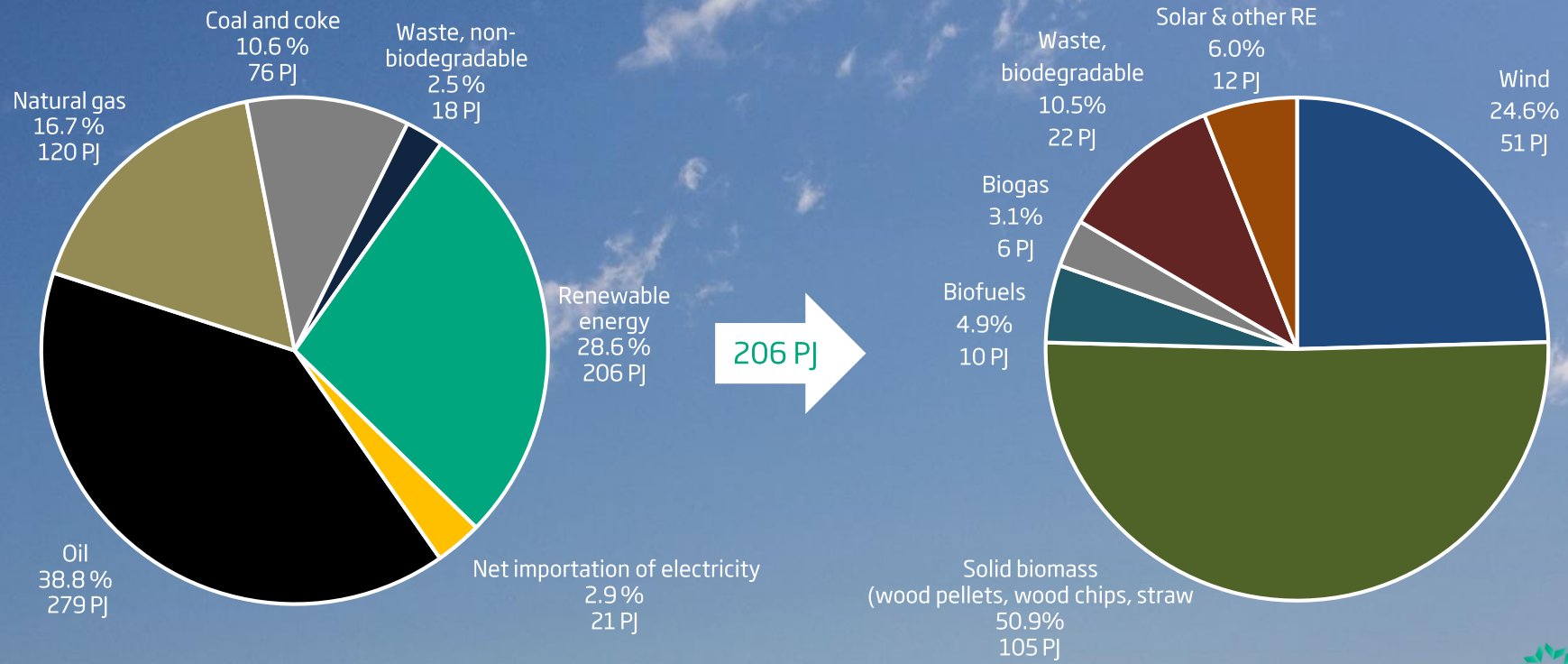
Source: The Danish Energy Agency, 2016

Denmark's Energy Consumption 2015



Source: The Danish Energy Agency, 2016

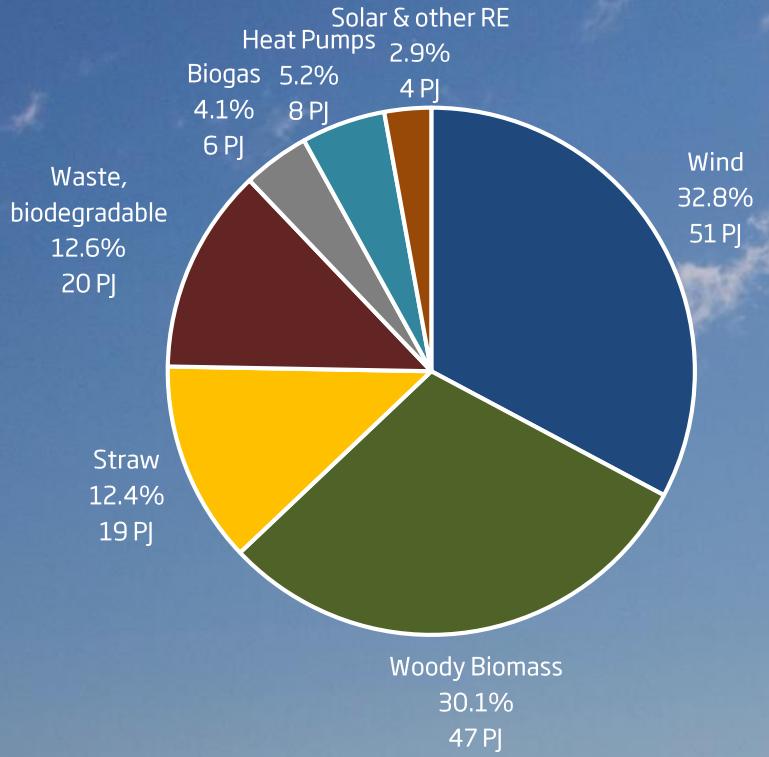
Denmark's Energy Consumption 2015



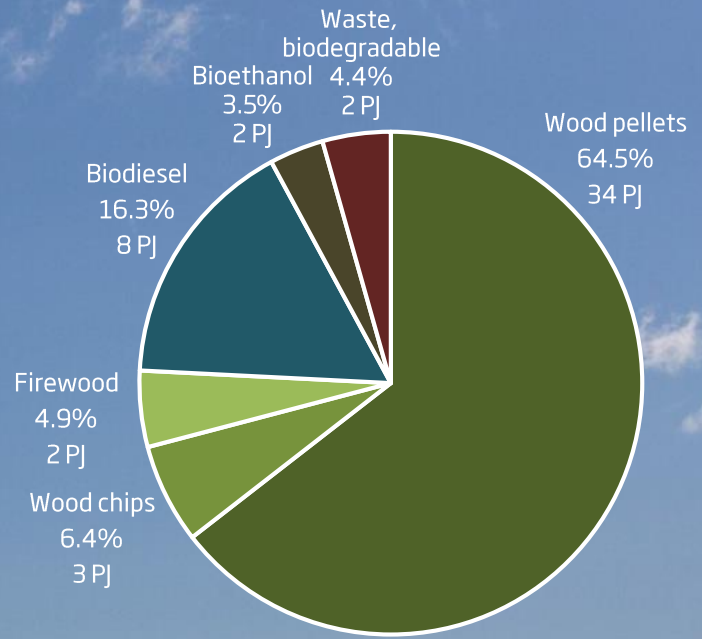
Source: The Danish Energy Agency, 2016

Denmark's Renewable Energy Mix 2015

National production input from resources: 155 PJ



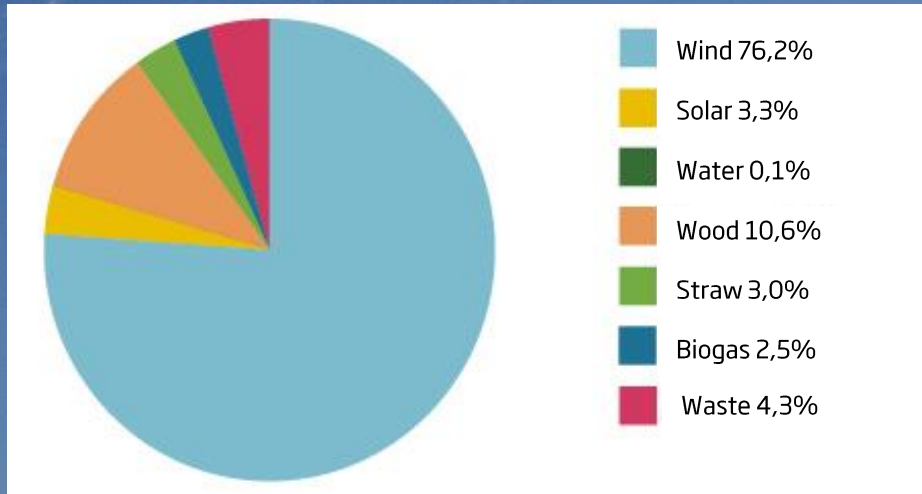
Import: 51 PJ



Source: The Danish Energy Agency, 2016

Renewable Energy in Electricity Production 2015

Mix of renewable energy sources for electricity production in Denmark in 2015



- In 2015, the total production of electricity from renewable energy sources was 18.546 GWh.
- This corresponds to 67% of the total electricity production in Denmark.
- Over the next 10 years, the share of electricity production from renewables is expected to increase to around 82%.

Denmark a fossil fuel independent society by 2050

➤ March 2012: New Danish energy agreement

➤ The agreement is characterised by its ambitious scope, broad political support and long time horizon

➤ Target is 100% renewable energy in the energy and transport sectors by 2050

➤ Energy Commission set up 2016: Focus on how to meet international climate obligations in a cost-efficient way

➤ 40% share of renewable energy in energy consumption by 2020

➤ 50% share of renewable energy in energy consumption by 2030

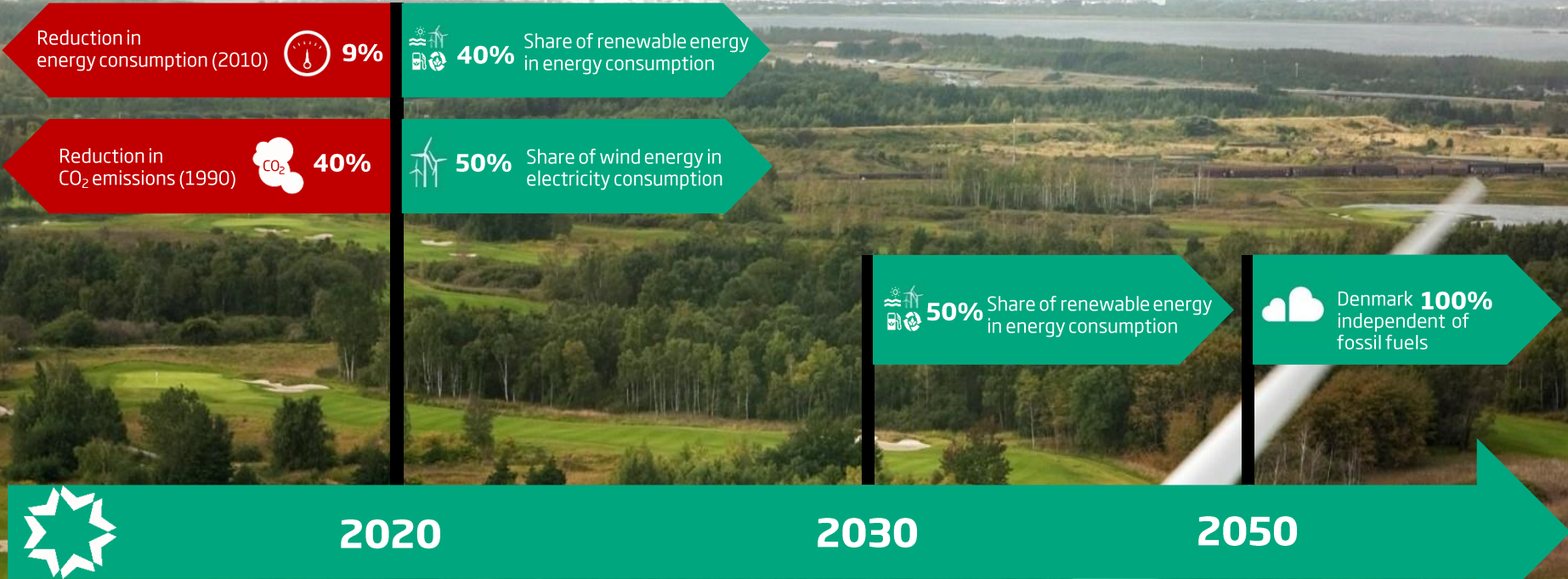
➤ 100% independent of fossil fuels by 2050

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Denmark a fossil fuel independent society by 2050



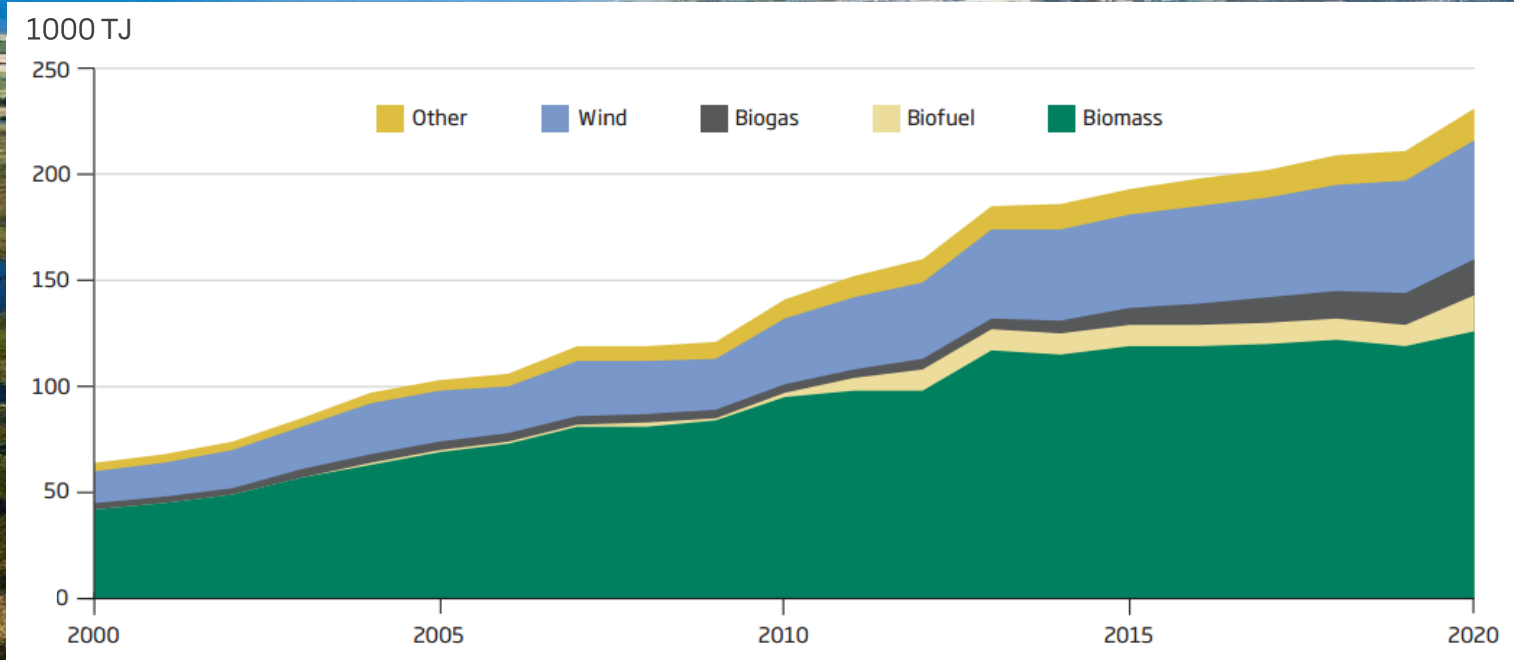
2020

2030

2050



Denmark's RE mix towards 2020

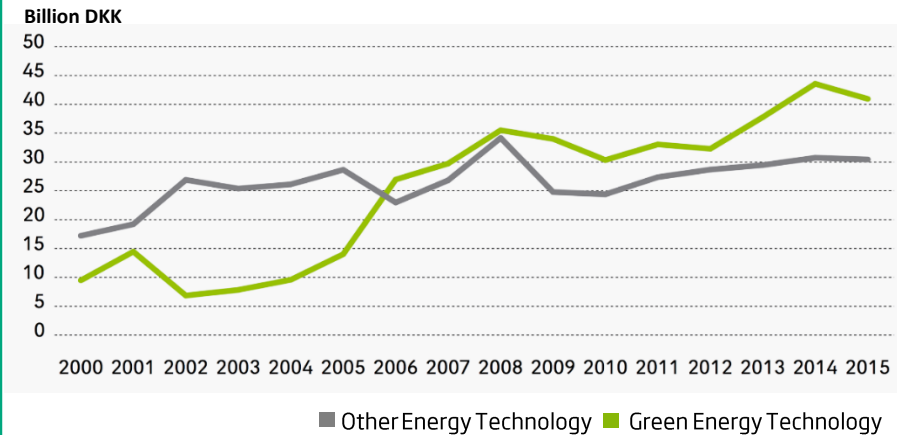


With a significant increase in solid biomass, biogas as well as biofuels, bioenergy will continue to make up the majority of total Danish renewable energy consumption in 2020.



Green Business is Good Business

- Exports of 'Green Energy Technology' in 2015: EUR 5.50 billion (DKK 40.9 billion) 6.4% of total Danish exports.
- Since 2000, exports of 'Green Energy Technology' have increased by more than 300%.
- Post-COP21: Increased demand for green technologies and solutions.
- Need for stable energy supply



Note: Exports in current prices and excluding oil rigs
Source: Eurostat and calculations by the Confederation of Danish Industry, The Danish Energy Association and the Danish Energy Agency

Green impacts on Danish society

59,000
green jobs in
2014

2.8%
of total
employment
in Danish
companies

11%
of Denmark's
total
industry
employment

**EUR 23.3
billion**
Turnover for
Danish
companies'
green goods +
services in
2014

**EUR 9.6
billion**
Export of
energy
products and
services in
2014





Wind Energy - Balancing the grid

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Wind Energy in the Danish Grid



In 2015, the Danish capacity of wind energy reached 5 GW

By 2020, 50% of Danish electricity consumption will be supplied by wind energy

37.6% of Denmark's electricity consumption covered by wind in 2016

Wind covered on average 110% of the electricity consumption on 24-25 December 2016

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Offshore Wind in Denmark - Moving Ahead

Many offshore projects in the Danish wind energy pipeline before the end of 2021

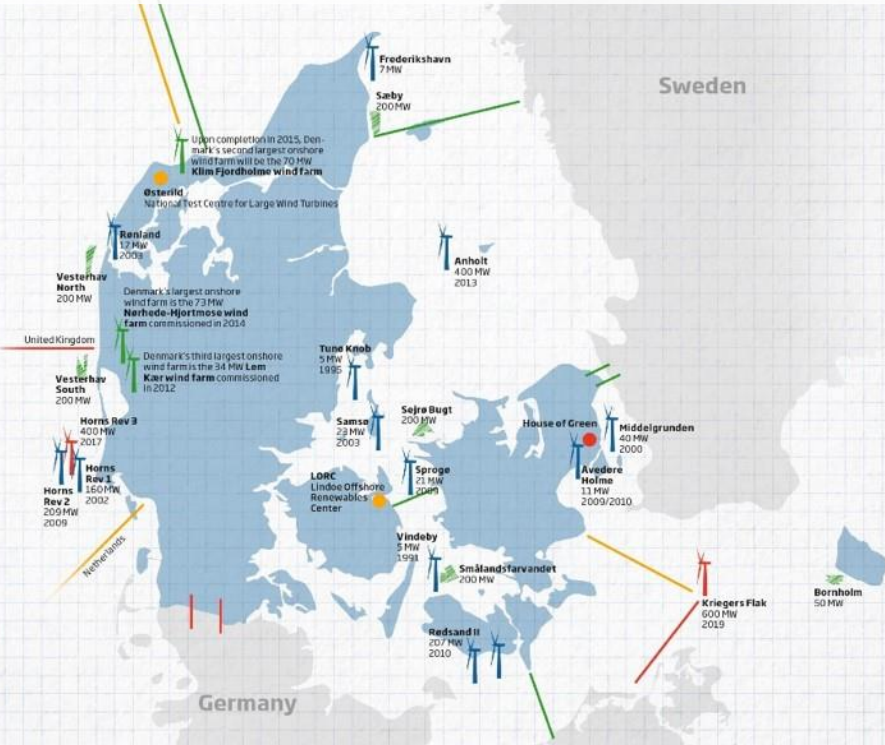
- › Horns Rev 3 (400 MW, bid of EUR 0,103/kWh, DKK 0.77/kWh)
- › Kriegers Flak (600 MW, bid of EUR 0.05/kWh, DKK 0.372/kWh)
- › Vesterhav Nord (170 MW, near shore)
- › Vesterhav Syd (180 MW, near shore)
- › Nissum Bredning (28 MW, test and demonstration offshore)

Vattenfall tender bid for Kriegers Flak (EUR 0.05/kWh, DKK 0.372/kWh) is the lowest ever for offshore wind globally

Grid Connections Ensure Flexibility

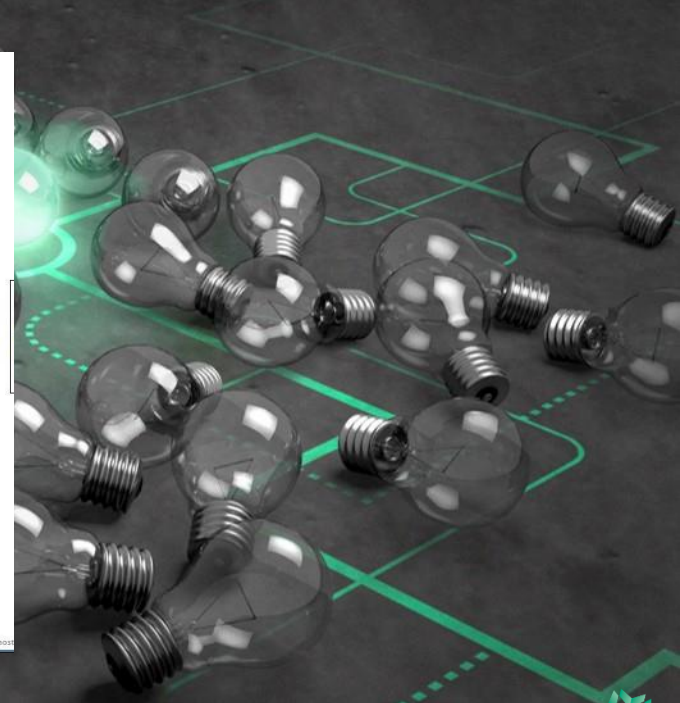
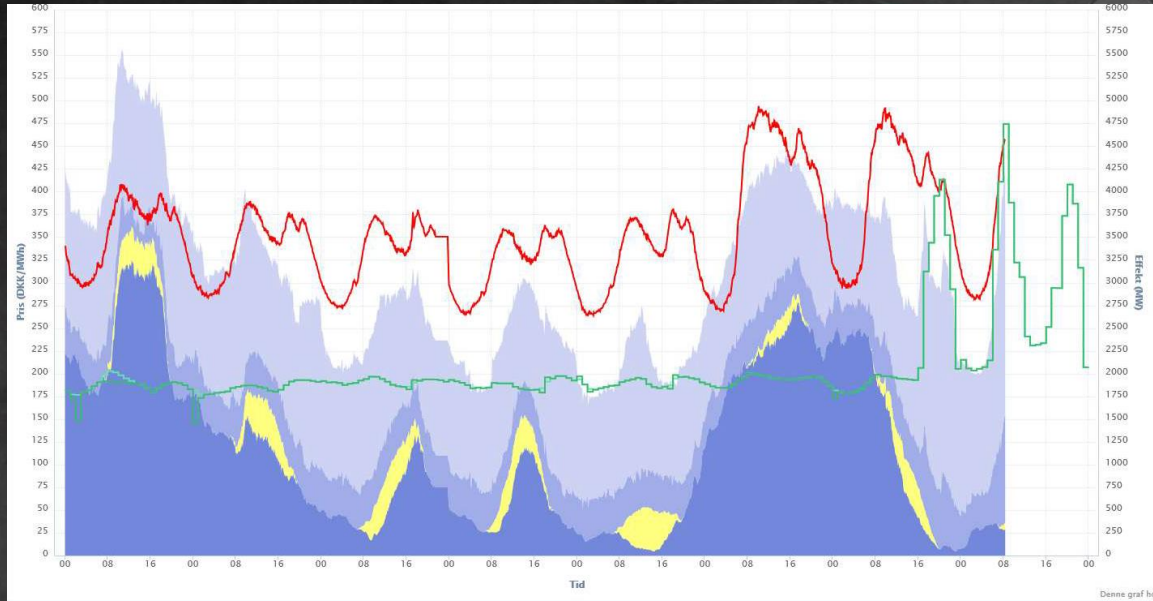
The power exchange Nord Pool ensures that Denmark can sell wind energy when we have excess capacity and buy electricity from the neighboring countries, when there is no wind

Danish security of supply is very high - electricity is available more than 99.99% of the time



- Selected onshore wind farm
- Offshore wind farm (Commissioned)
- Offshore wind farm (Planned)
- Cable connections (Current)
- Cable connections (Planned)
- Cable connections (Proposed)
- Test facility
- Place of Interest
- Near shore area
- Possible installed capacity

Balancing supply and demand - today



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Thank you for your attention

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WIND POWER

Denmark was the first country to install wind turbines more than 30 years ago and has been first mover in the wind industry for decades. On- and offshore wind turbines provide more than 33 per cent of Denmark's electricity consumption today.

START HERE

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SOLUTION GREEN BOXES

As the official green brand for Denmark, State of Green is excited with presenting Danish green technology and solutions abroad at trade fairs, conferences, and high-level business promotion trips. To...

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- RESEARCH, TEST & DEMONSTRATION IN WIND POWER

Connect with Danish expertise:
www.stateofgreen.com

Get in contact with State of Green:
+45 7210 0179
info@stateofgreen.com

Please take some materials and leave your name
and impressions in our guestbook