DONG Energy's contribution to the future energy demand

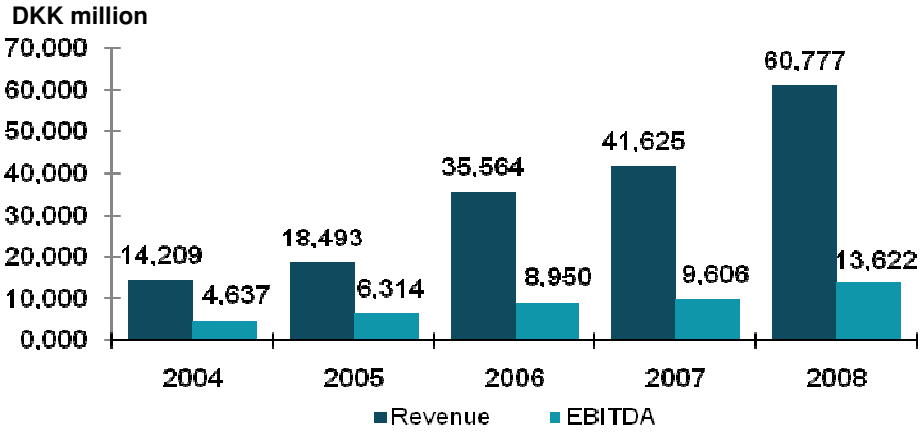
DETF autumn meeting. October 29, 2009
Henrik Stubbe

DONG energy

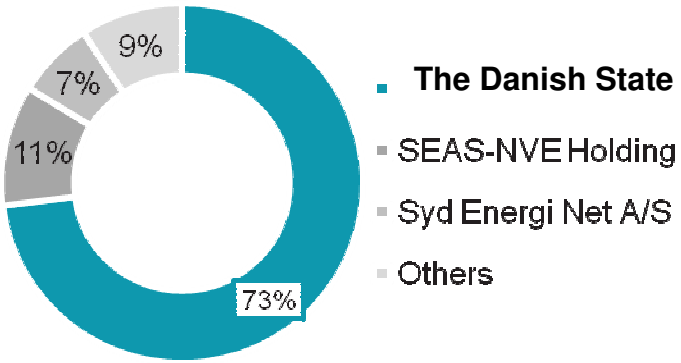
DONG Energy

- Procuring, producing, distributing and trading in energy and related products
- Leading on the Danish energy market
- One of the largest energy companies in Northern Europe
- 5.347 employees
- 73% owned by the Danish State

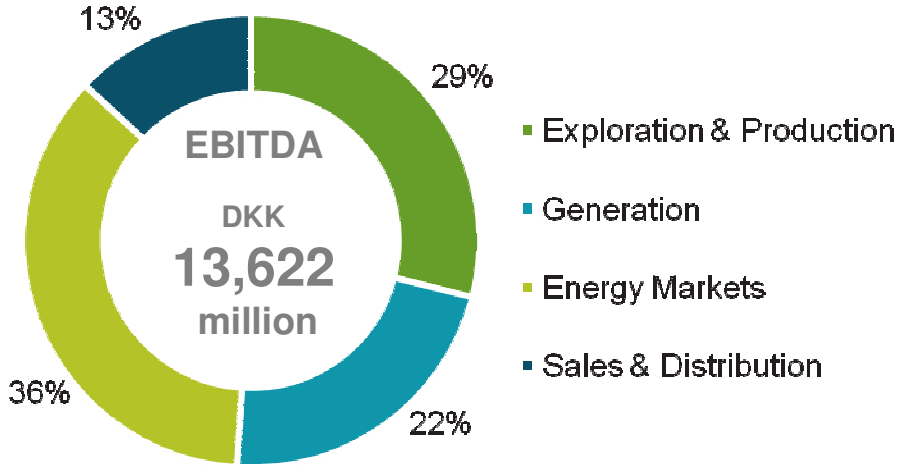
Key Figures



Ownership structure



2008 EBITDA per segment



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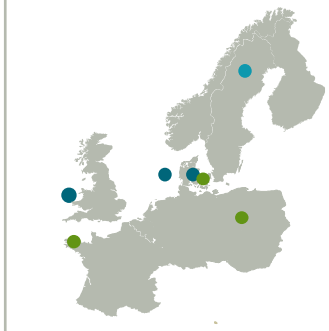
DONG Energy is present across natural gas and power value chains

	Generation		E&P	Distribution	Markets
Revenue[1] **Total: EUR 5.3bn**	EUR 1.0bn (19%)		EUR 0.7bn (14%)	EUR 0.3bn (6%)	EUR 3.3bn (61%)
EBITDA[1] **Total: EUR 1.2bn**	EUR 0.4bn (30%)		EUR 0.5bn (39%)	EUR 0.1bn (11%)	EUR 0.2bn (20%)
	 ● Central power plants	 ● Offshore Wind ● Onshore Wind ● Hydro power	 ● Focus areas	 ● Power distribution ● Natural gas distribution ● Natural gas storage	 ● Natural gas and/or power customers
	The leading thermal generator on Nord Pool	Growing renewables portfolio Market leader in offshore wind	Strong and growing equity gas position Strong exploration portfolio	Leading position in power and natural gas infrastructure	Denmark's largest seller of power and natural gas Growing sales across UK, NL and Germany

Note: 1. Percentage distribution based on Group 2006 pro forma figures before eliminations and other unallocated items

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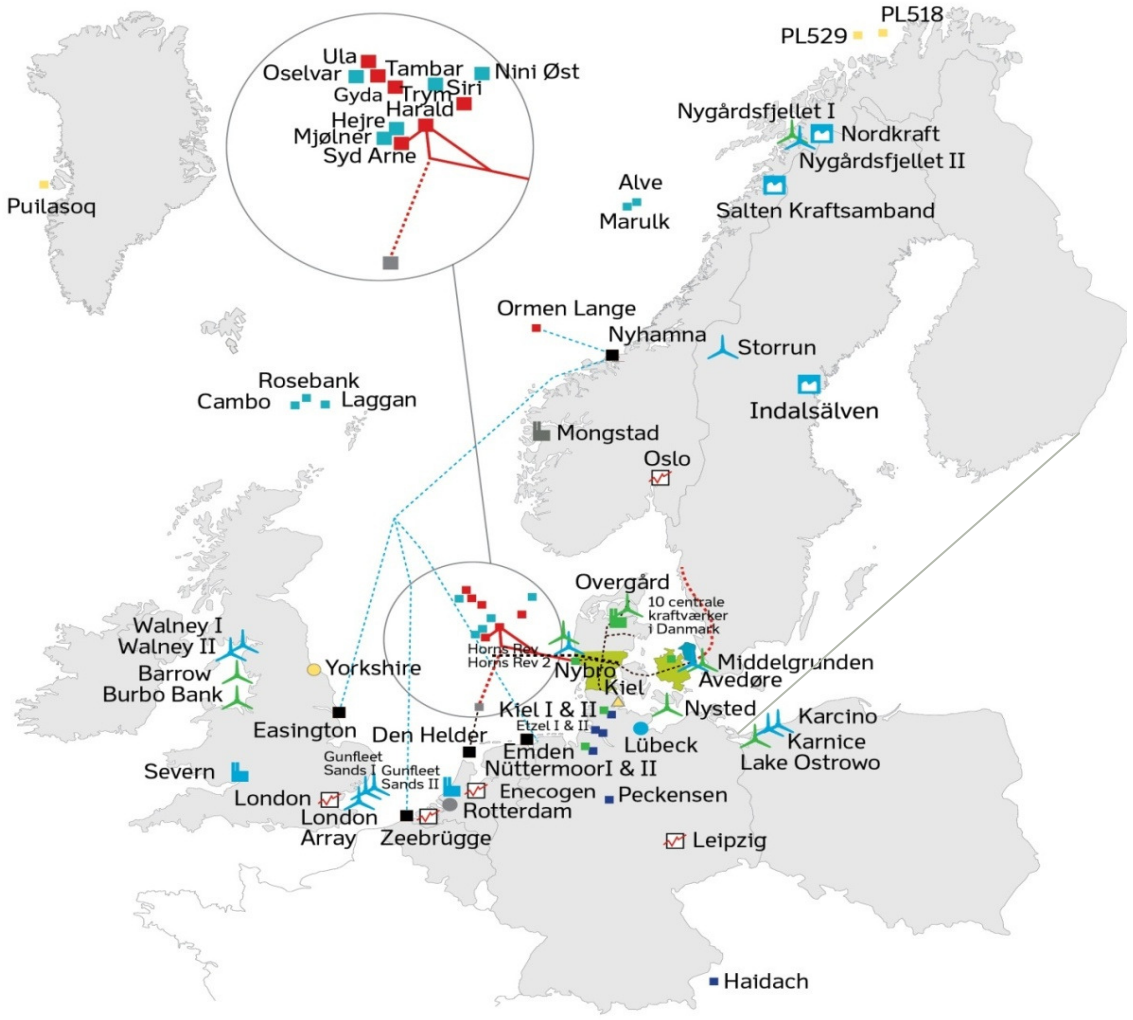
DONG Energy activities



- Exploration and production areas of oil and natural gas
- Natural gas pipeline owned by DONG Energy
- Natural gas pipeline owned by others
- Natural gas pipeline partly owned by DONG Energy
- Gassled natural gas transmission system partly owned by DONG Energy
- Oil pipeline owned by DONG Energy
- Hubs
- Natural gas distribution
- Natural gas storage
- Heat and power production
- Heat and power production project under development
- Power production project under development
- Wind power
- Wind project under development

- Electricity distribution
- Hydro power - partly owned by DONG Energy
- Stadtwerke Lübeck partly owned by DONG Energy
- Energy exchange
- DONG Energy offices
- Carron Engineering & Construction - subsidiary fully owned by DONG Energy
- DONG Energy pipelines GmbH - subsidiary fully owned by DONG Energy
- Liquefied Natural Gas (LNG) terminal, partly owned by DONG Energy, project under development
- Producing oil/natural gas field - partly owned by DONG Energy, DONG Energy is licence partner
- Producing oil/natural gas field - partly owned by DONG Energy, DONG Energy is licence operator
- Producing oil/natural gas field - owned and operated by others

[1] Under construction, commissioning expected in 2010

[2] Awaiting final investment decision

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Global energy demand is expected to double by 2050

- Energy is essential for modern life
- 1 billion people benefit from a modern lifestyle…
- … but 6 billion people also want the modern lifestyle
- Those not yet born will also want a modern lifestyle
- By 2050, population growth will have added another 3 billion to global population

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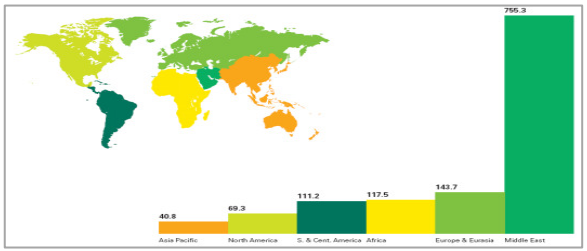
More than 80% of global energy consumption comes from fossil fuels

Fossil fuel reserves are diminishing and will not be replaced

- Estimated world fossil energy reserves at current demand levels
  - Coal: 120 years
  - Natural gas: 60 years
  - Oil: 40 years.
- Global energy demand expected to double by 2050

The world's energy resources are unevenly distributed

- **40 % of oil reserves in Saudi Arabia, Iran and Iraq**
- **50% of natural gas in Russia, Iran, Quatar**
- **60% of the world's coal reserves in USA, Russia, China**



Source:: BP Statistical Review of the World Energy 2009

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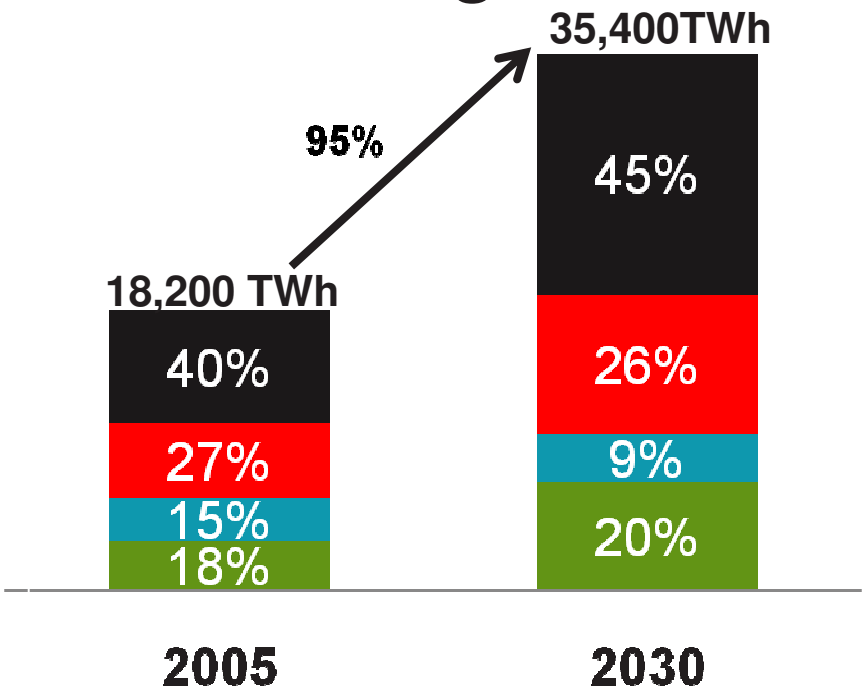
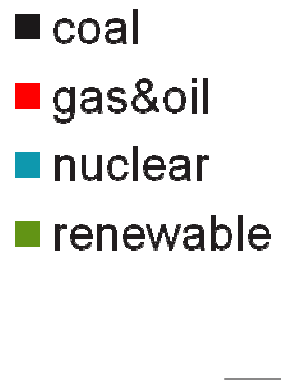
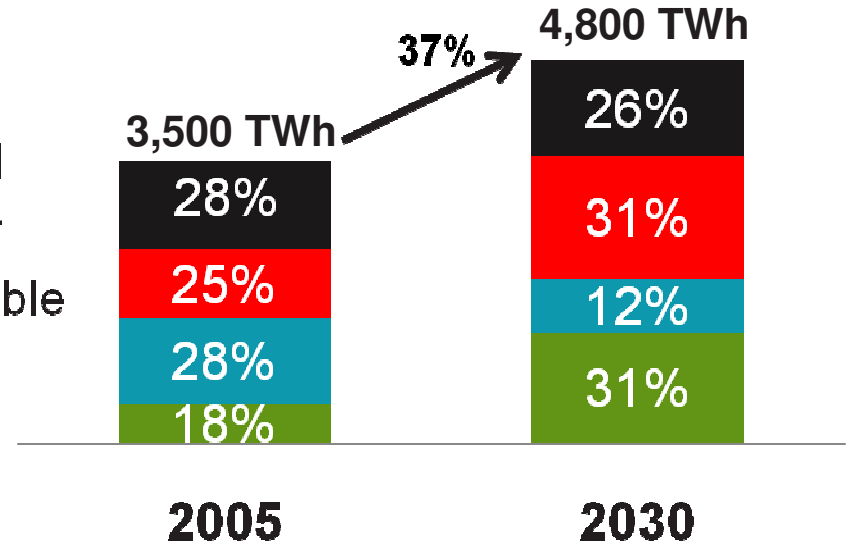
Primary energy sources for electricity generation 2005-2030

Global generation





European generation



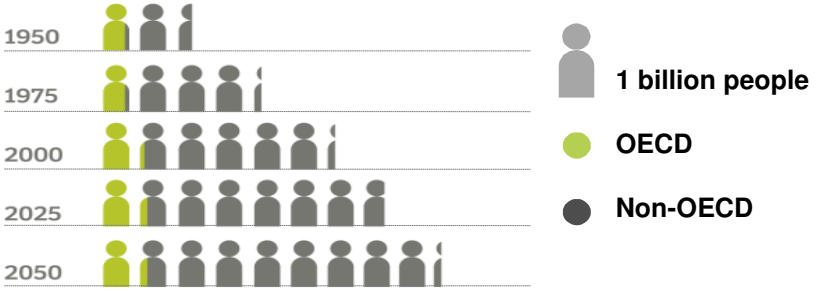
World Energy Outlook, 2007, Reference Scenario, World and OECD Europe

DONG Energy Power Production 1.half, 2008

The world faces a climate and an energy challenge

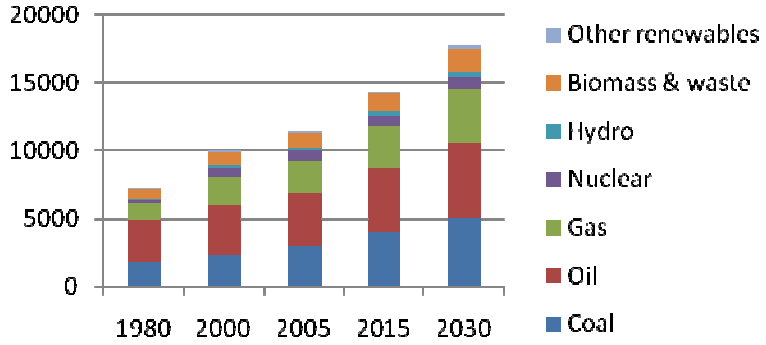
FACT

A growing population and a spread of modern life facilities leads to increased energy consumption



FACT

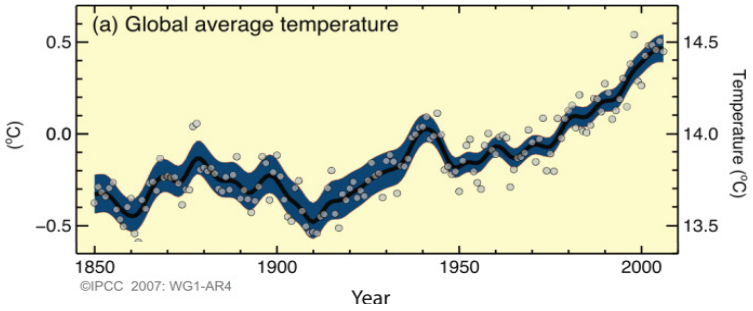
The increased energy consumption will primarily be met by energy production based on fossil fuels



The global challenge: To produce more energy with reduced climate impact

FACT

Already today, the energy consumption has led to climate change



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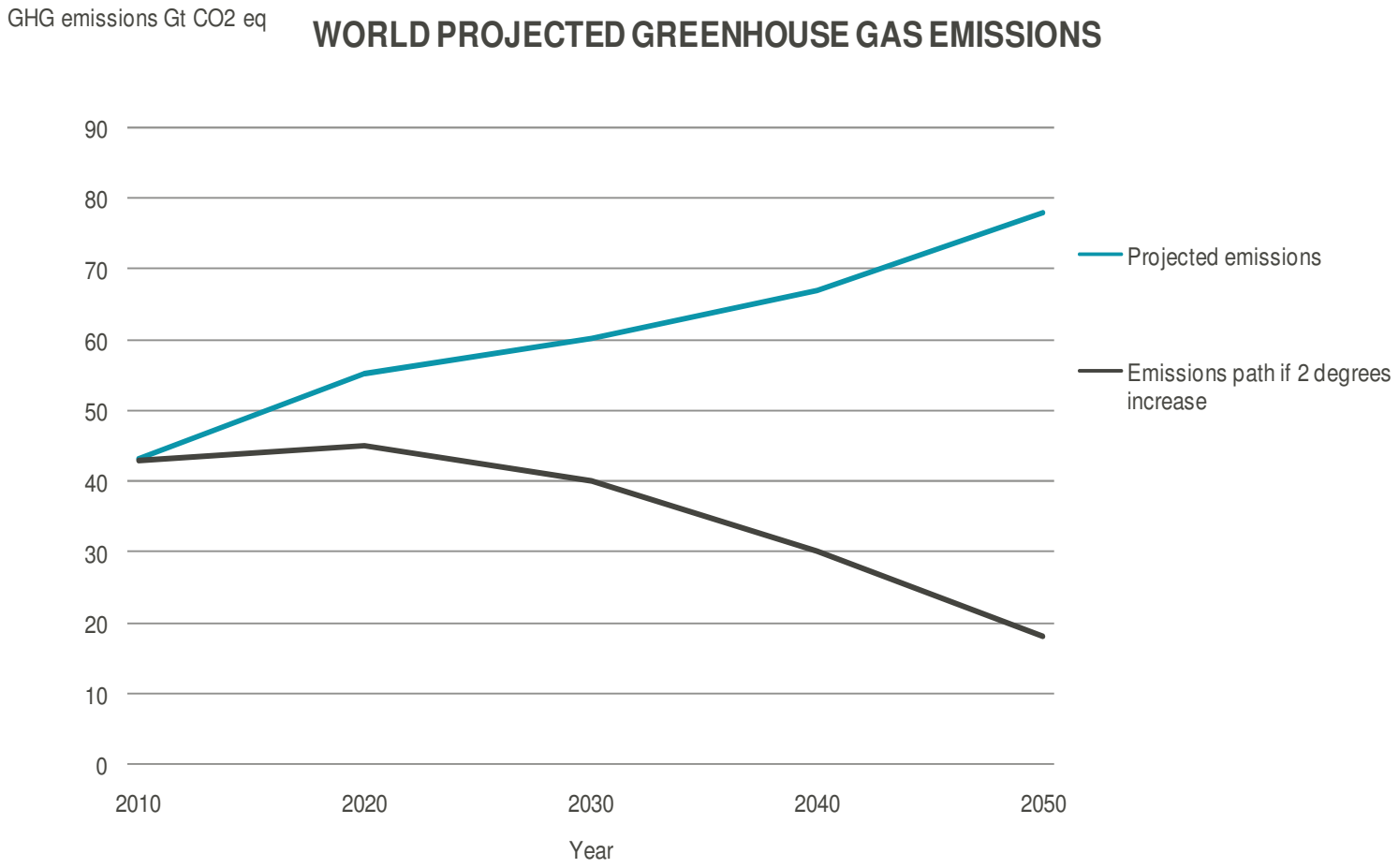
… leading to CO_2 emissions way above levels necessary to limit temperature rises if we continue "business as usual"



Source: IPCC, Climate Change 2007 Synthesis report

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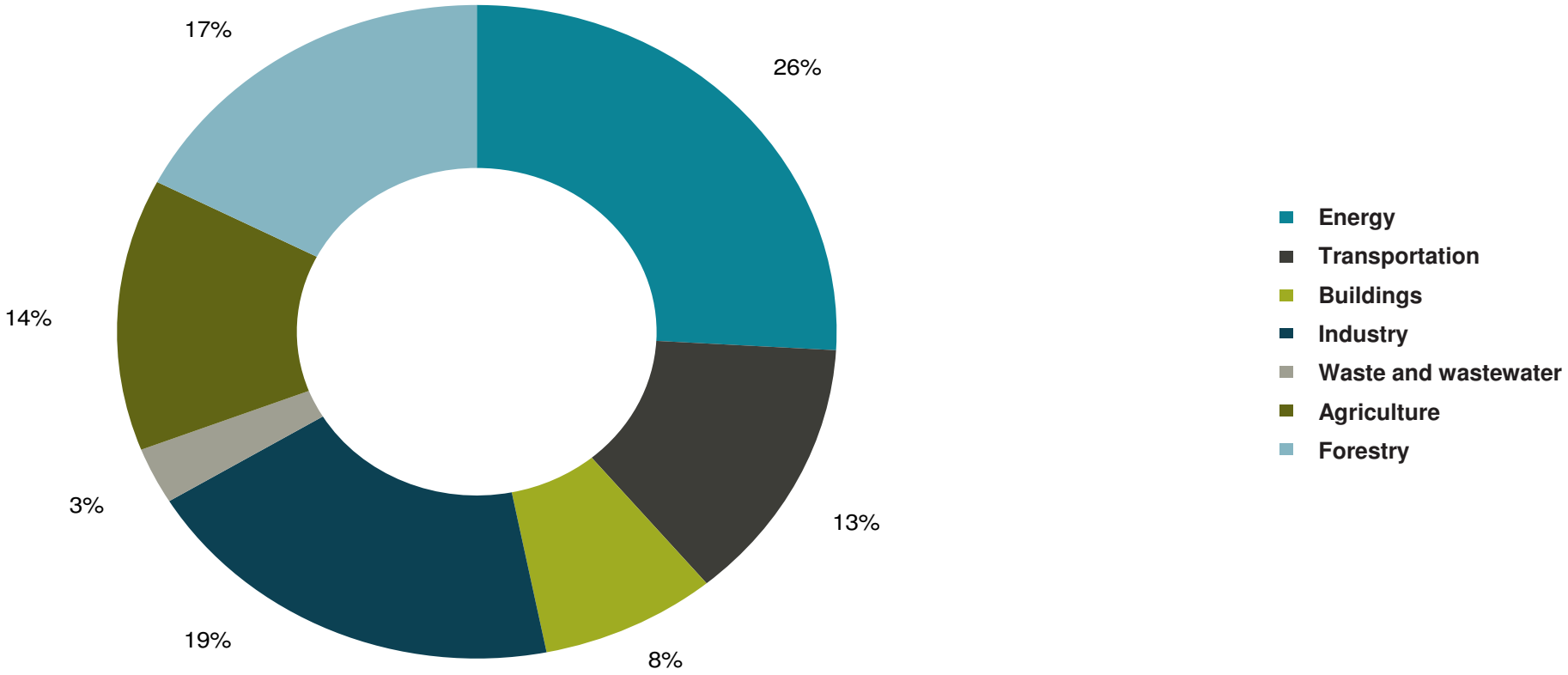
All sectors need innovative climate solutions

Global CO_2 emission per sector



Source: IPCC 2007

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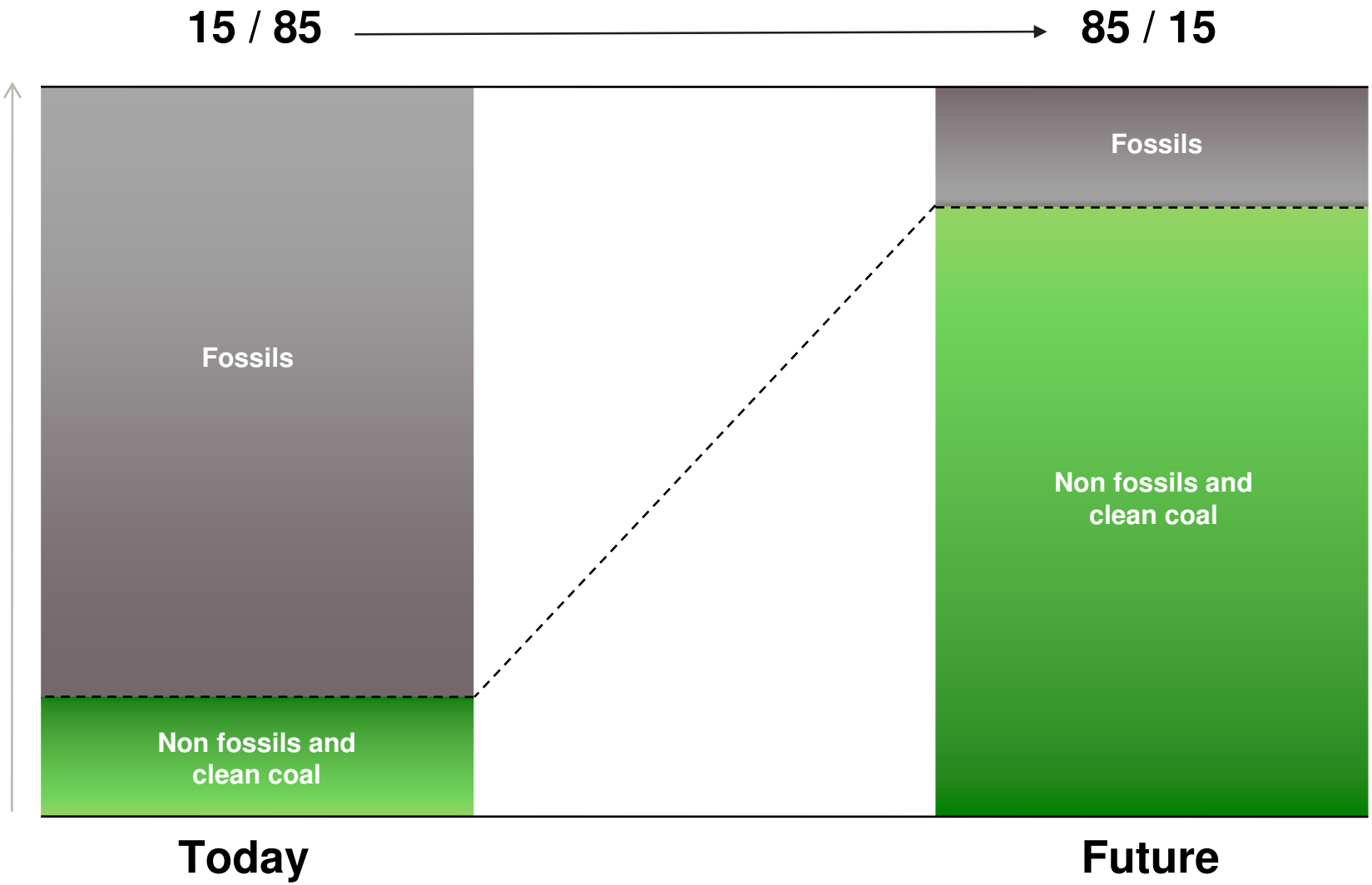
DONG Energy's transforming to a Low Carbon Future



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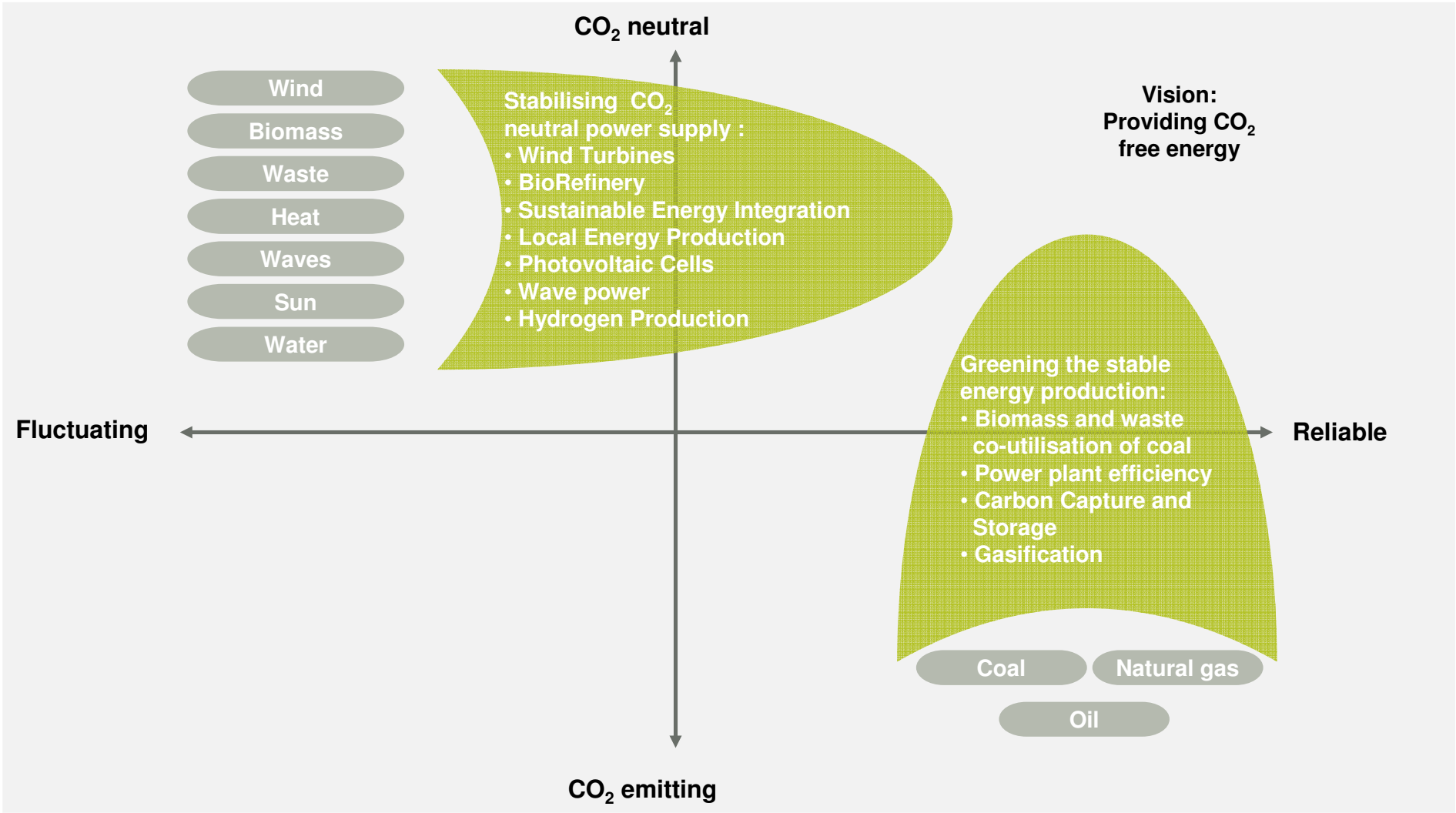
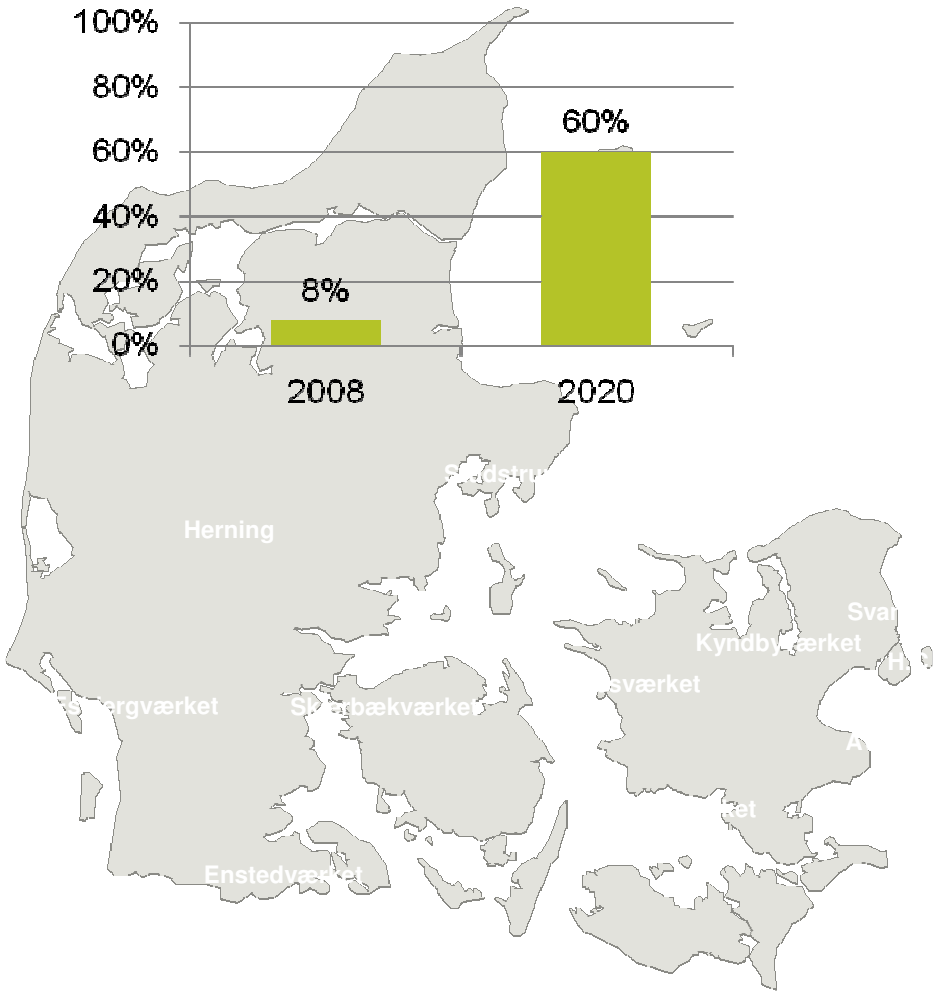
DONG Energy's vision for reliable energy supply without CO_2 emission

DONG Energy combines different resources to provide reliable and CO_2 neutral energy



Biomass has a substantial potential to reduce carbon in Denmark and abroad



- DONG Energy is leading in combined heat and power production
- DONG Energy is leading in biomass combustion
- Biomass projects in Denmark and abroad will sustain our position
- Biomass sourcing will be a mix of domestic and foreign biomass
- Only a small fraction of the global biomass potential is used (less than 0.5% of yearly wood harvest residues are converted to wood pellets)

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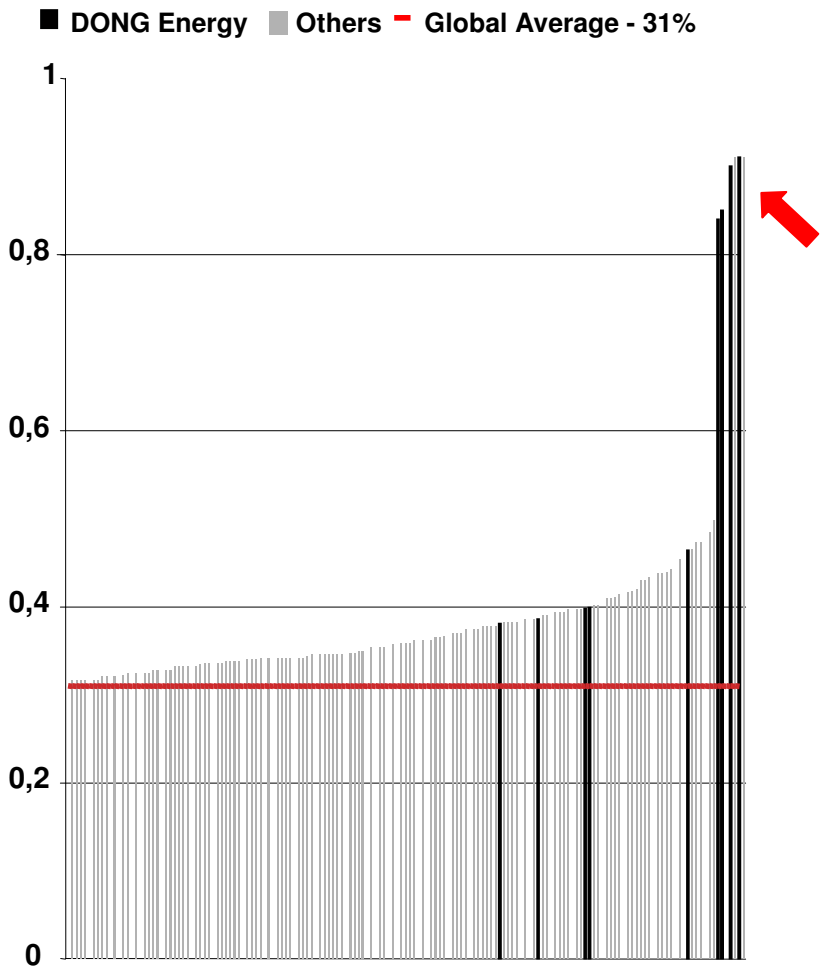
The World's energy can be produced much more efficiently

Imagine if all power plants in the World were as efficient as DONG Energy's…

- ✓ Global CO_2 emissions from coal: 30% ⬇
- ✓ Global CO_2 emissions: 9% ⬇



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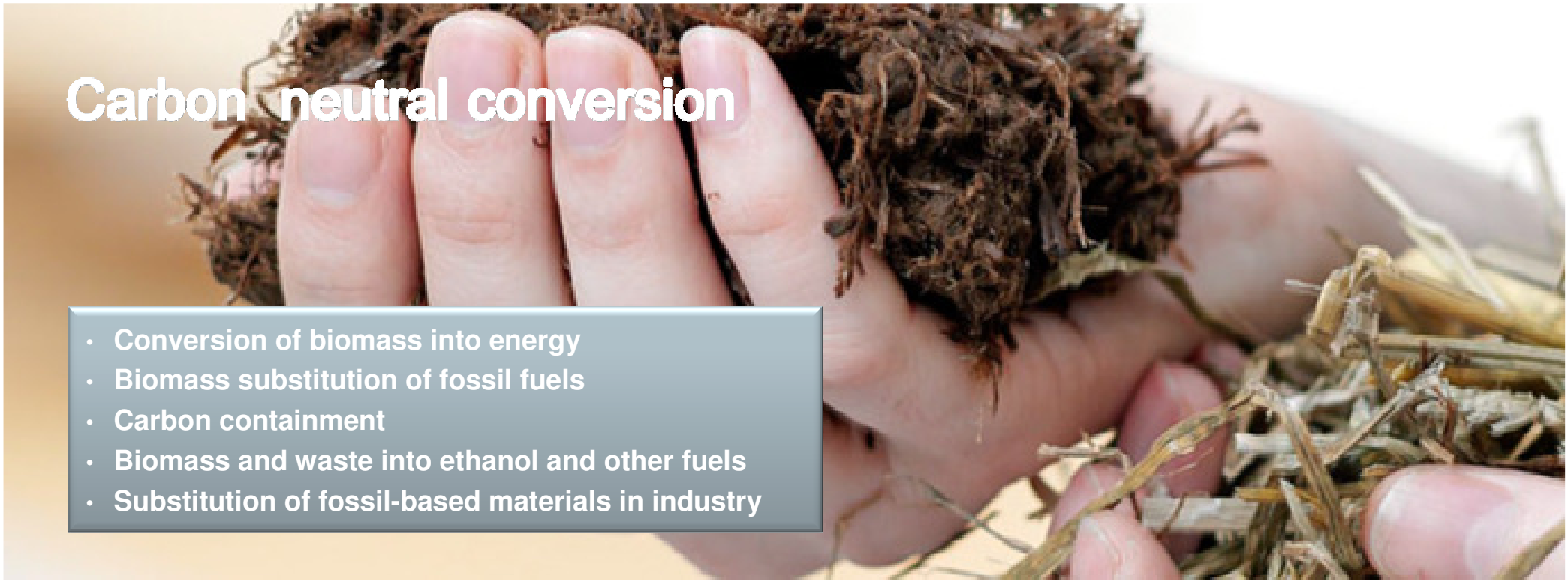
Carbon neutral conversion



- Conversion of biomass into energy
- Biomass substitution of fossil fuels
- Carbon containment
- Biomass and waste into ethanol and other fuels
- Substitution of fossil-based materials in industry

Existing Projects

- Improved co-combustion of biomass and waste
- High-efficiency flexible power plants
- New sources and types of biomass
- Carbon capture, CASTOR
- Biomass sourcing and logistics
- Inbicon 2nd gen bioethanol demonstration plant
- REnescience household waste utilisation

Future Innovation Challenges

- How can we get access to much larger volumes of biomass?
- How do we improve the efficiency of biomass utilization?
- How do we contain carbon economically?
- How can we increase the value of the biomass resources?

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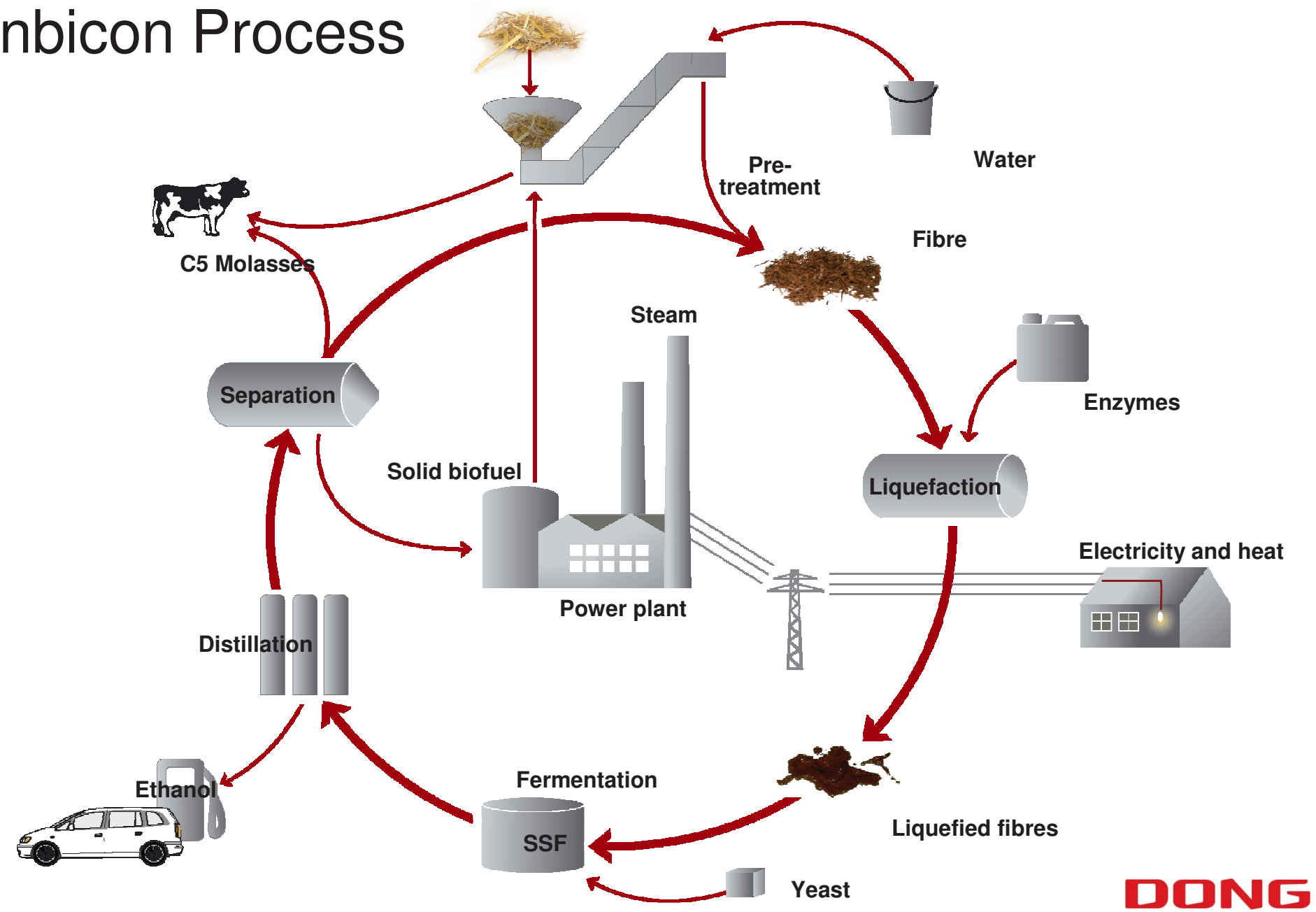
Inbicon Process



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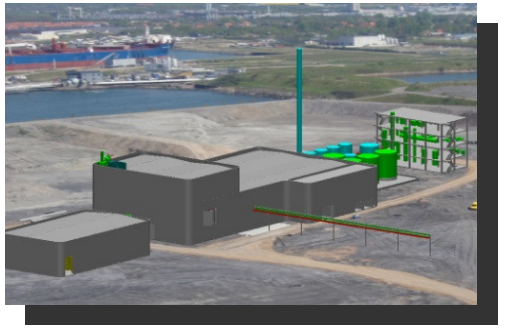
Inbicon's proven technology

2009: 100 MT/day

Input:
30,000 MT Wheatstraw

Output:
5,4 mill. liters ethanol
8,250 MT biofuel
11,250 MT C5-melasse



Pre-qualified enzyme suppliers:
Danisco Genencor and Novozymes

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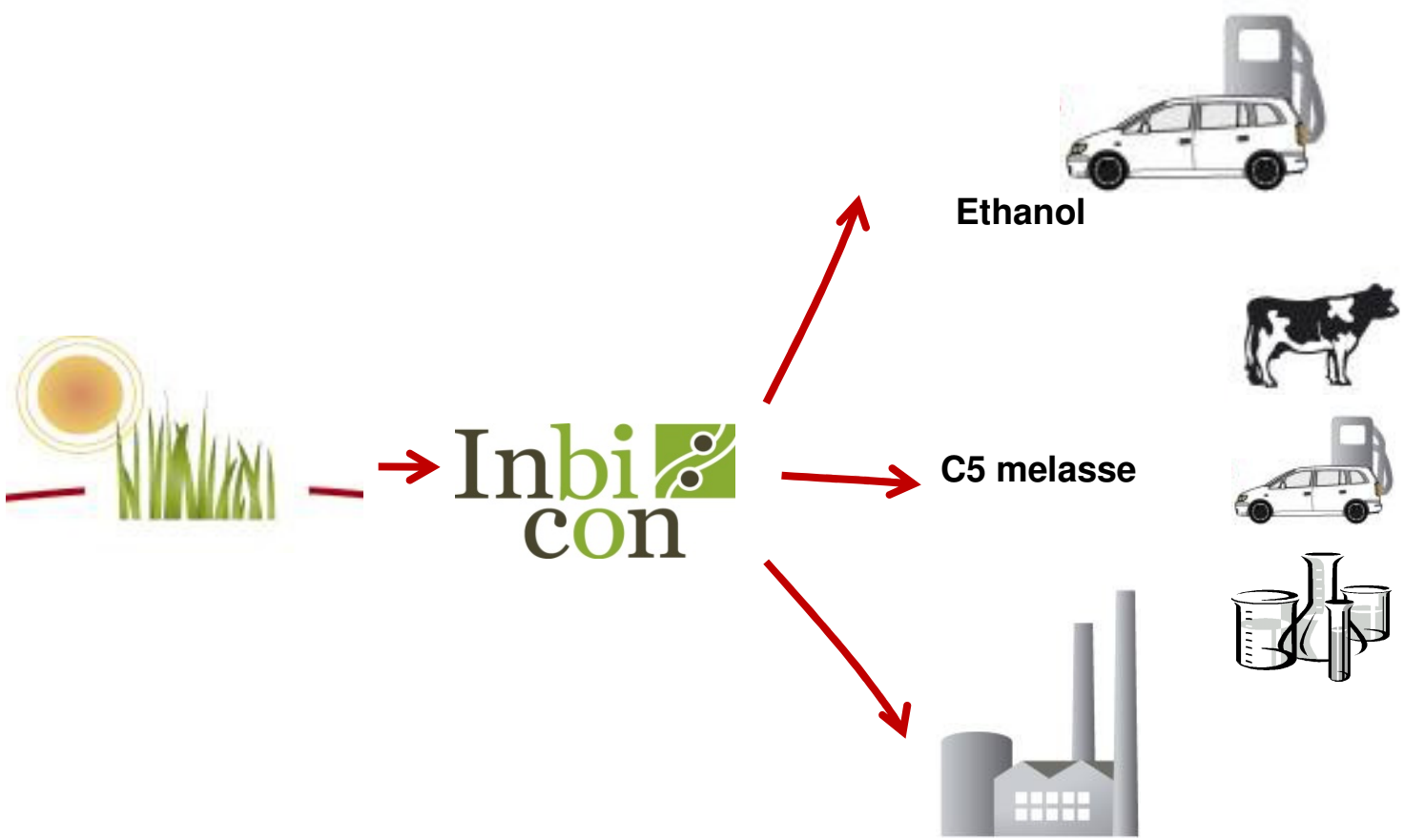
Inbicon's intelligent use of biomass



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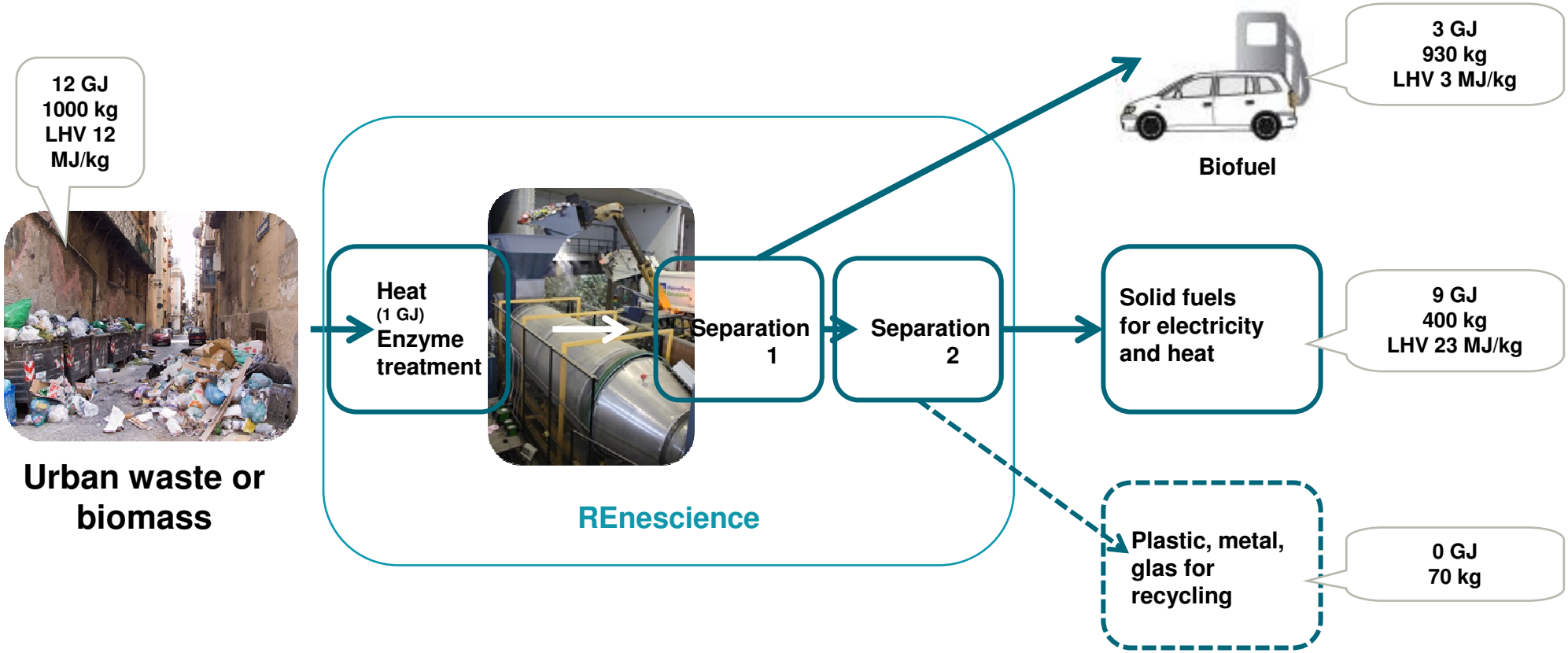
New technologies to reuse urban waste



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Energy from Natural Forces

- Windpower
- Wave and tidal energy
- Solar power and heat
- Exploiting offshore operations

Existing Projects

- New offshore foundations for windpower
- New installation concepts
- Windpower resource modeling, wind farm lay-out, production forecasts
- Wave energy, Wavestar, Poseidon
- Efficient offshore operations and maintenance

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DONG Energy and windpower

- We have participated in the establishment of 5 of 8 large offshore installations in the world
- We operate 4 offshore installations
- We are expanding
- Horns Rev 2 – offshore, Denmark
- And an additional 4 offshore installations and several onshore projects.
- Purchase of 500 new windmill to offshore projects– total capacity of 1800 MW

- Wind capacity today: 500 MW
- Additional 3.000 MW capacity installed by 2020
- Equivalent to an investment of EUR 5 billion
- We will maintain the leading position

- Horns Rev II –the World's largest offshore wind power installation.
- Will provide capacity to supply app. 200.000 households with electricity
- Equivalent to 2% of Denmark's aggregate electricity consumption
- Without CO_2

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Powering transport

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Flexible customer solutions – Smart Mobility

•DONG Energy is concentrating on electricity in transport.

•Main activities are:
•Better Place (concept & infrastructure),
•Etrans (user driven concepts),
•Edison (technology- and system-study)

•We are designing and constructing infrastructure for deployment and controlling EV´s in Denmark.

•We are focusing on concepts for first movers and early adopters.

Business concepts with existing technology (Verification and maturing)

2009 - 2010

Construction of base of intelligent EV´s (ready for Better Place)

2010 - 2012

Establishing advanced optimisation and control of EV´s through VPP

2012 -

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Energy for transportation is a challenge

Electric cars can utilise excess wind power and recharge at night using cheap electricity

→Electric cars make it possible to utilise more renewable energy

→ A single 2 MW wind turbine can provide 3,000 electric cars with energy

The electric cars will primarily be recharged at night when excess wind power production is often available

→ Batteries are four times more effective as an energy provider compared to hydrogen

→ Even if all electricity were provided solely by coal-fired power plants, the CO_2 emission per car would be only 50% that of a traditional car.

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"Buy a car, subscribe to kilometres"

- → The customer acquires an electric car excl. a battery
- → Better Place Denmark leases the battery to the customer
  - The customer has made no investment and takes no risk as regards the battery. Payment for recharge and battery replacement can be included in the subscription.
- → Better Place Denmark installs communication unit in the car
  - Optimises the car's recharge times compared to the customer's consumption pattern and with the option of ad hoc control.
- → Daily transport needs are covered by recharging on the grid
- → Long-distance needs are covered by battery switch at battery replacement stations

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The Better Place electric vehicle - specifications

- ✓ Renault-Nissan is first supplier, others have been invited
- ✓ Medium sized car with performance and top speed as a normal car - top speed 140 km/h
- ✓ Acceleration from 0 to 100 km/h under 10 sec.
- ✓ Battery capacity at 150 km
- ✓ Load: 4-5 passengers and boot – just as a normal car
- ✓ Sound: a silent humming
- ✓ New battery technology with optimal safety

- ✓ Local exposure: no pollution
- ✓ Long-term environmental exposure: The batteries are returned and redeployed
- ✓ Climate exposure: CO_2 emissions 50% less than a normal car

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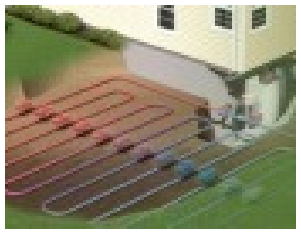
Flexible customer solutions – Smart Housing

Directions:

- Locally produced energy is becoming cheaper
  - Mass production
  - Technology development enhances the efficiency
- The customers
  - focus on energy savings and energy choice
- Centrally produced energy is becoming more expensive
  - use climate-friendly solutions
- There are many local energy-technologies
- many suppliers and knowledge domains involved
- It is a business opportunity to bundle solutions and services together

Micro wind turbine

Photo voltaic



Earth varmth

Heat pump

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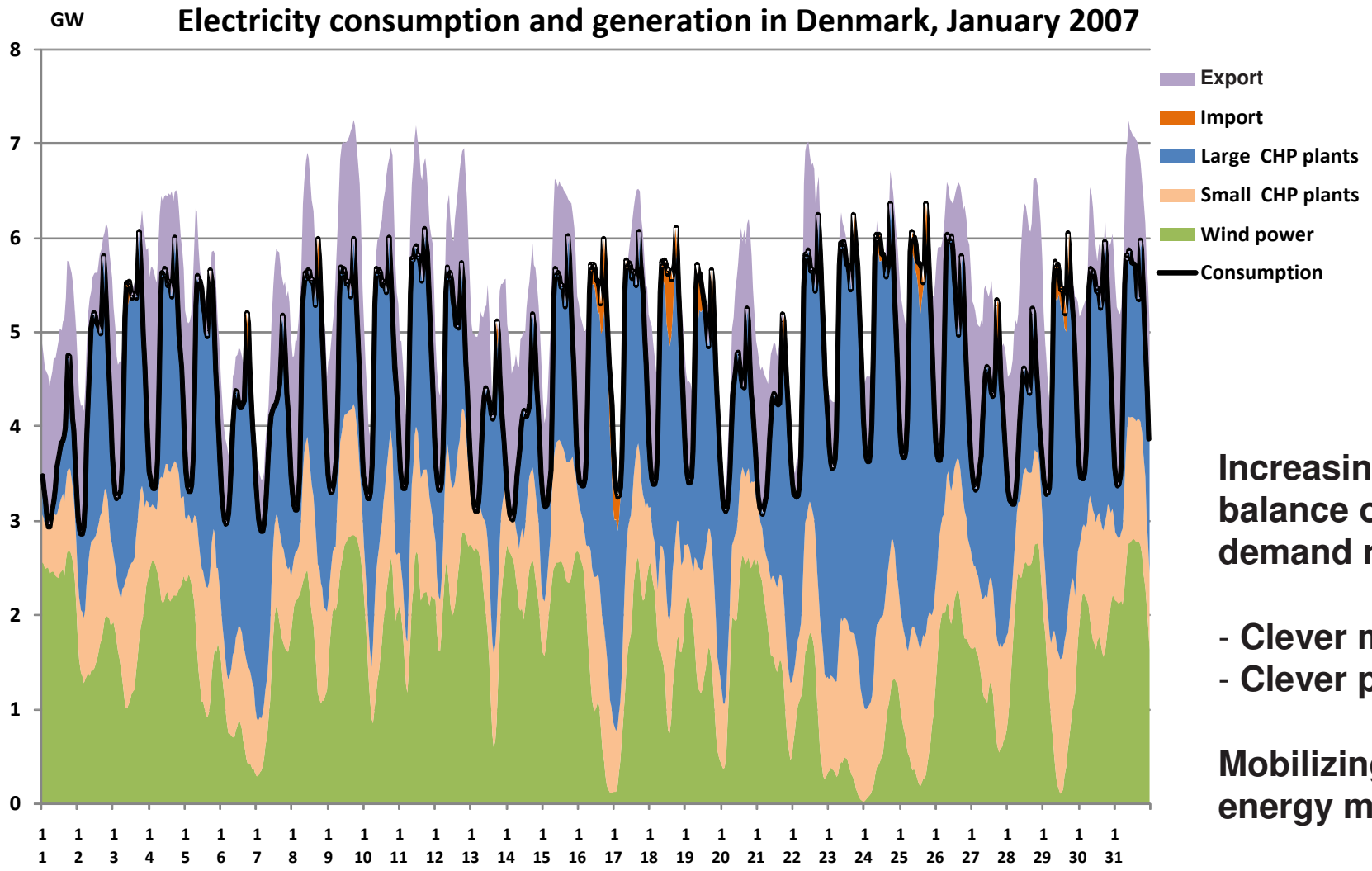
Integrating wind power in Denmark



Increasingly challenging balance of supply and demand requires

- **Clever markets**
- **Clever policy**

Mobilizing intelligent energy management

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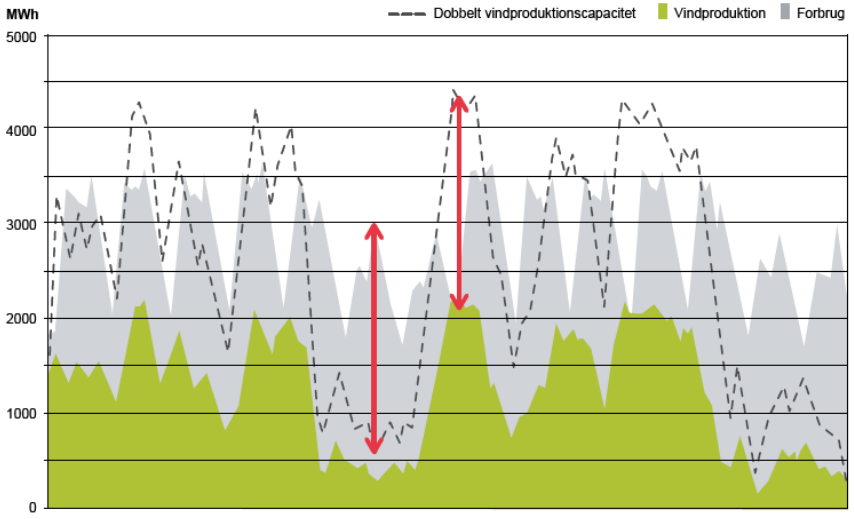
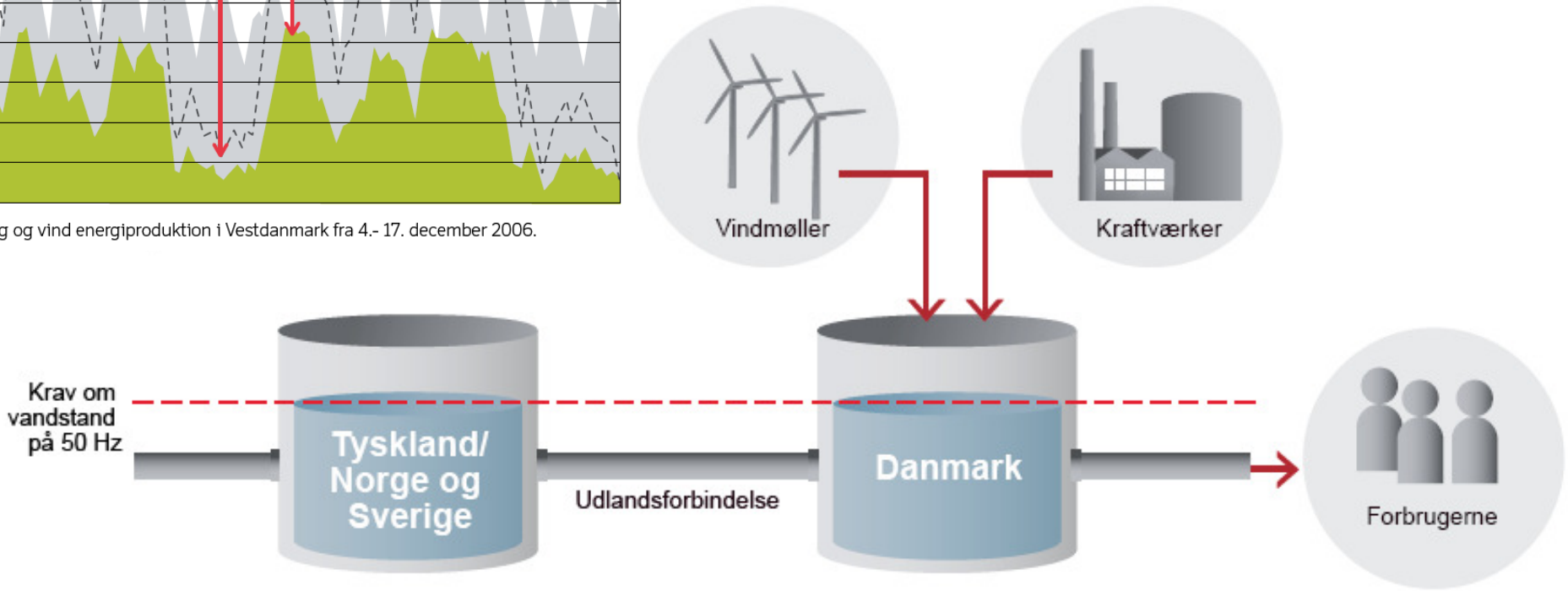
The challange on integrating large amounts of vindpower



Forbrug og vind energiproduktion i Vestdanmark fra 4.- 17. december 2006.



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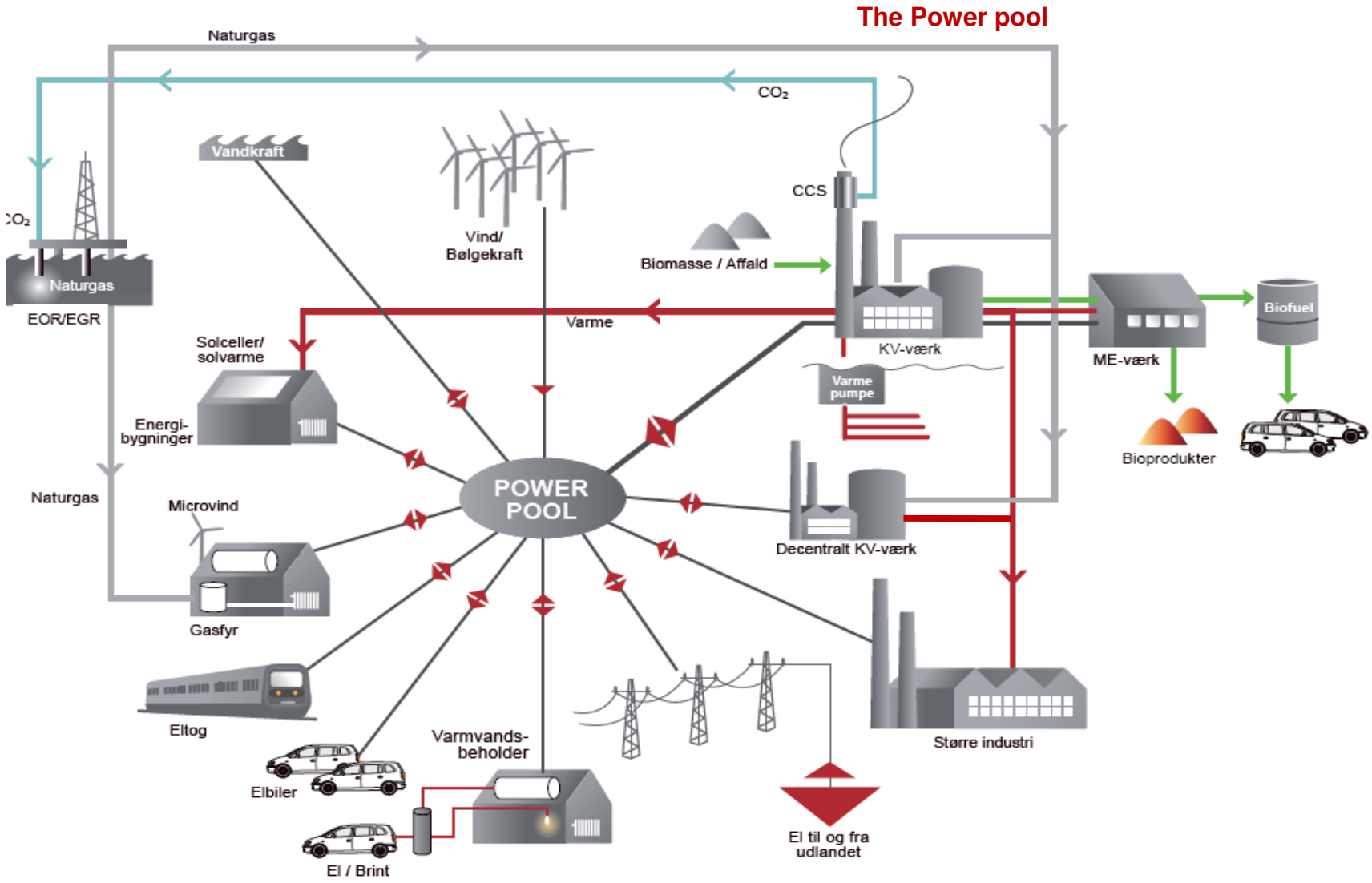
The energy system tomorrow



The intelligent energy system with mobilized local assets

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Thank you for your attention

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