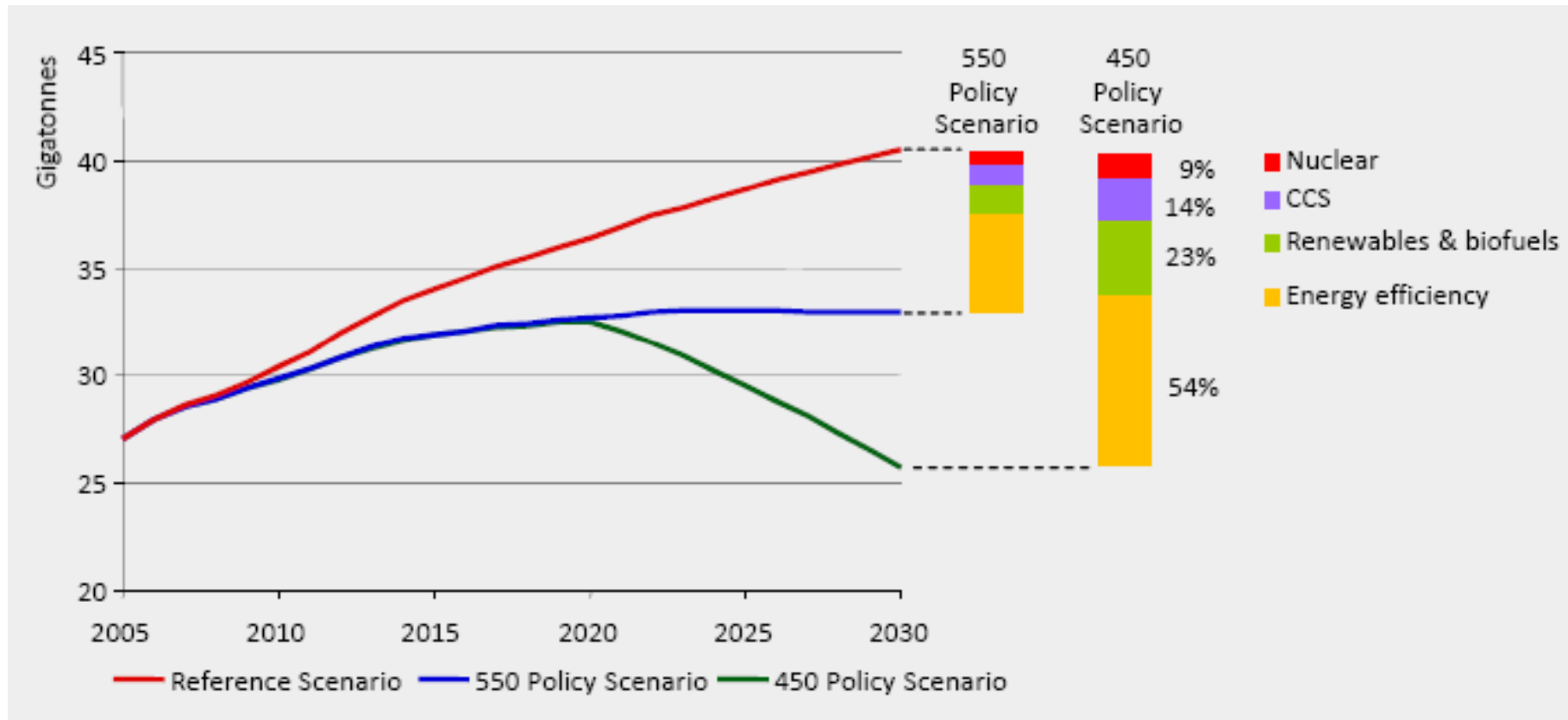


# Integrated Energy

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# More than half of CO<sub>2</sub> reductions in the 450 ppm scenario comes from energy efficiency



Source: IEA, World Energy Outlook 2008

# More efficient and clean coal-fired power plants

## ▪ Efficient production

- High efficient coal-fired power plants, using the world's best technologies
- State-of-the-art, 300bar/600°C coal-fired power plants -aiming at AD700 design code
- At the new Danish coal-fired power plants has a thermal efficiency level is close to 50%
- The power plants can easily switch production between different types of fuel
- Co-firing capability of coal, biomass and waste

# More efficient and flexible power plants

- **Efficient production and CHP**

- Denmark has a unique tradition for combining power and heat generation.
- The surplus heat from generation of power is transmitted to district heating plants, industry and individual users for heating or cooling.
- By using this method utilization level is close to 90%
- This requires a strong infrastructure and symbiosis between CHP and industry

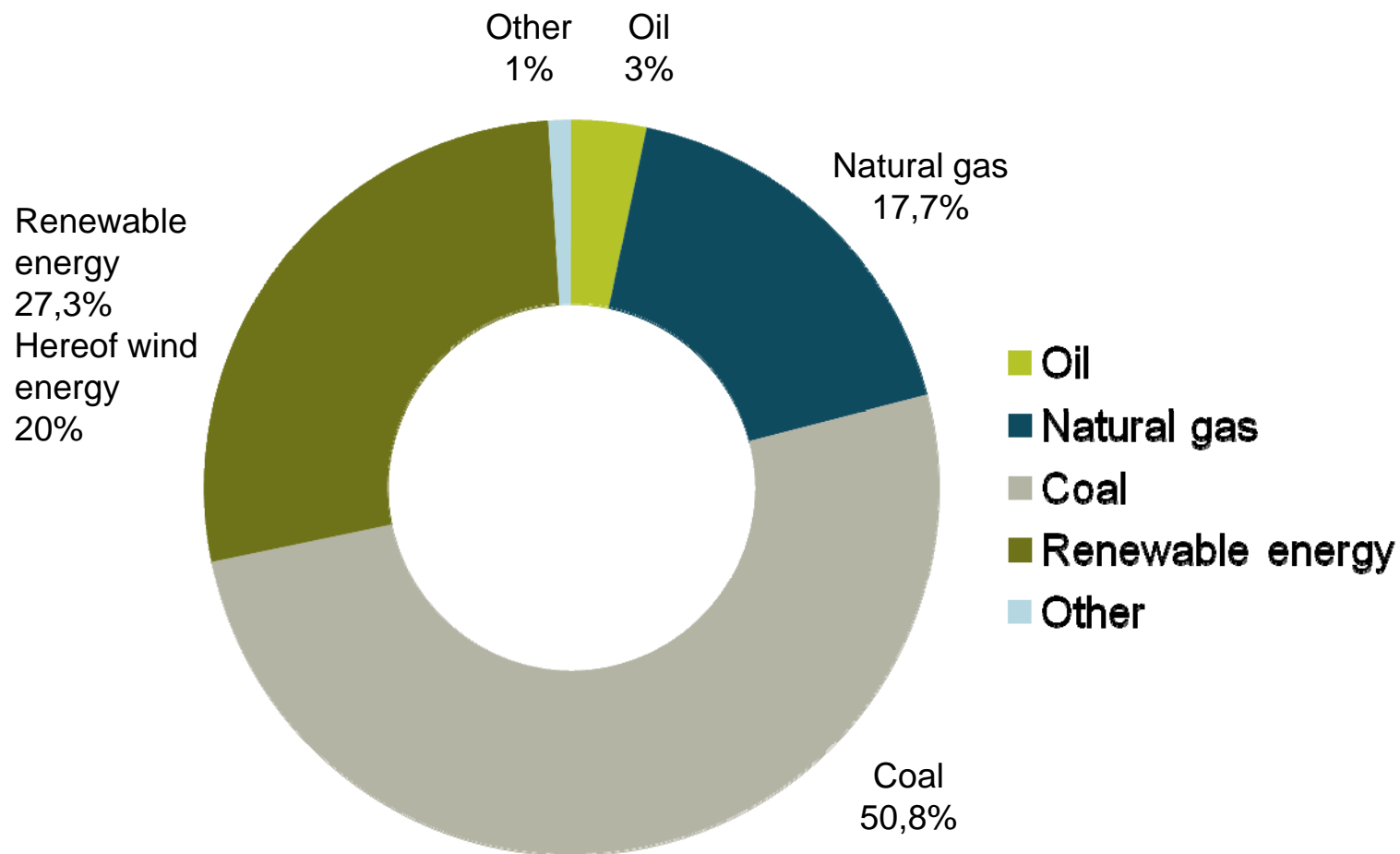
- **Integration of renewable energies**

- Wind
- Flexibility and backup from thermal energy production
- Integration of energy and transportation

- **Developing Carbon Capture and Storage Technologies**

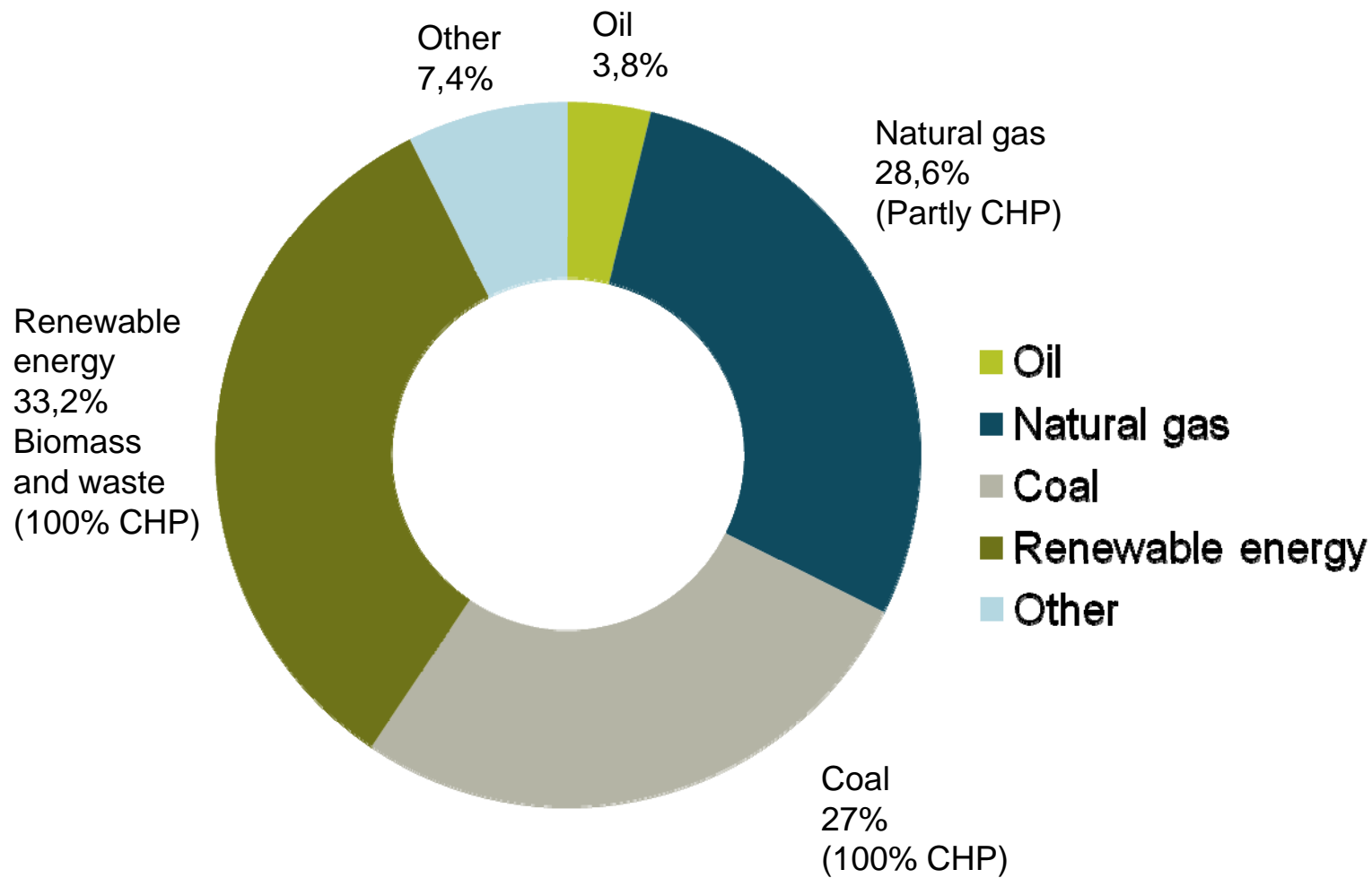
- A long term perspective

# Fuel consumption in production of electricity in Denmark



Source: Danish Energy Agency, 2007

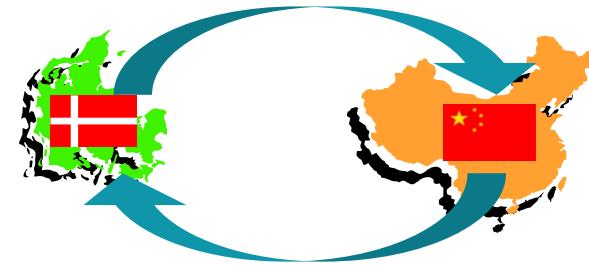
# Fuel consumption in production of district heating in Denmark



Source: Danish Energy Agency, 2007

# Danish solutions in a Chinese context

Solutions implemented in Denmark would have significant impact if adapted in the development of new Chinese infrastructure to meet the demands of a growing economy.



▪ **Thermal efficiency in coal fired power stations** in China in 2030 at current Danish level could reduce CO<sub>2</sub> emissions with **19%** in China and 5% globally. It would save 35% of coal consumption for power generation.

Reduction by replacing 7% coal fired power. Larger reduction if combined with high efficiency and CHP.

▪ Using **biomass** in China in 2030 at current Danish level could reduce CO<sub>2</sub> emissions with **5%** in China and 2% globally

Increasing average efficiency in 2030 from 35% to 55% through high temperatures and CHP

▪ **Wind power** in China in 2030 at current Danish penetration level could reduce CO<sub>2</sub> emissions with **14%** in China and 4% globally.

Replacing 20% coal power require investing in 750 GW wind and **infrastructure for integration.**

▪ **Electric cars** at 20% market penetration in China in 2030 could reduce CO<sub>2</sub> emissions with **1%** in China and 0,3% globally

20% of total car stock of 270 mill. in 2030. Electricity from **renewables enhance the reduction markedly.**

Approximations based on IEA World Energy Outlook 2008 and Danish statistics

**DONG**  
energy