

Transforming the Energy system to Achieve the 2°C Target: Investment Risks and Policy Challenges

„New Coal From a Generator's Perspective“

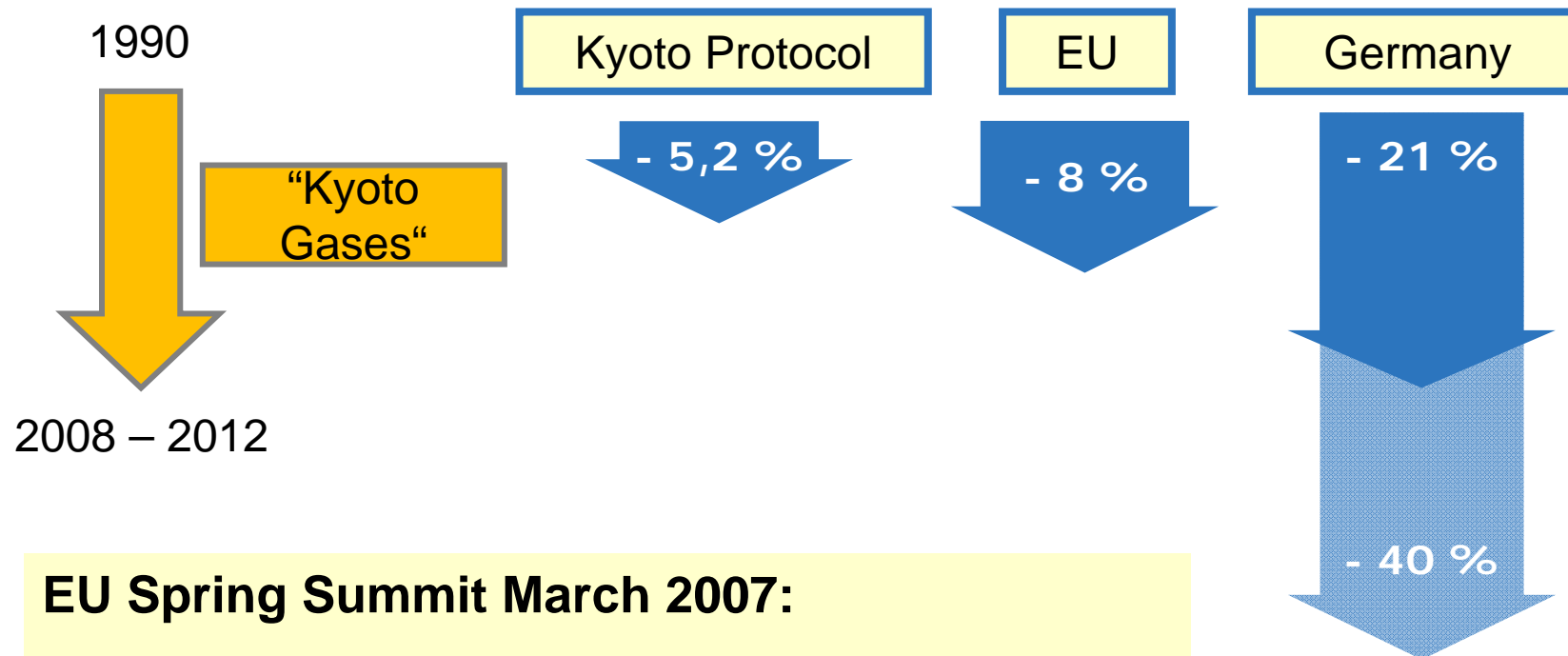
Wolfgang Dirschauer, Vattenfall Europe

Vattenfall: A Leading European Energy Company

- Europe's fifth largest generator of electricity and the largest producer of heat
- Net sales 2008: EUR 15,041 million
- Operations in Sweden, Finland, Denmark, Germany, Poland, the Netherlands, Belgium and the UK with a total of 7.4 million electricity customers and 5.6 million network customers
- Electricity: generation, transmission, distribution and sales
- Heat: production, distribution and sales
- Gas: distribution and sales
- Energy trading and lignite mining
- Consulting and contracting activities in the energy sector
- 40,000 employees
- Vattenfall AB is wholly owned by the Swedish state



Political ambitions, targets and obligations



EU Spring Summit March 2007:

"Climate Consensus"

- 20 % unilateral emissions reduction, 30 % conditional
- Germany: 40% unilateral reduction (legally non-binding)

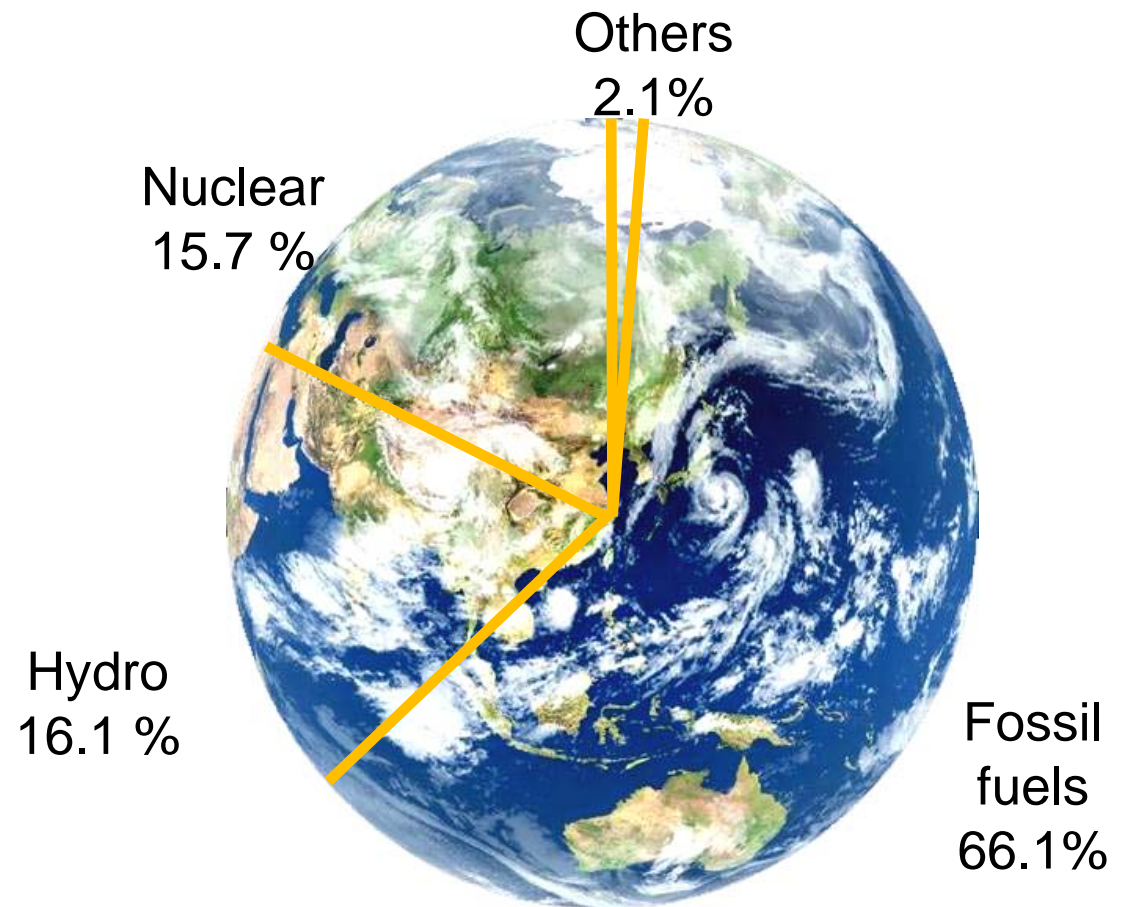
CCS – A Global Perspective

global electricity supply - 2008

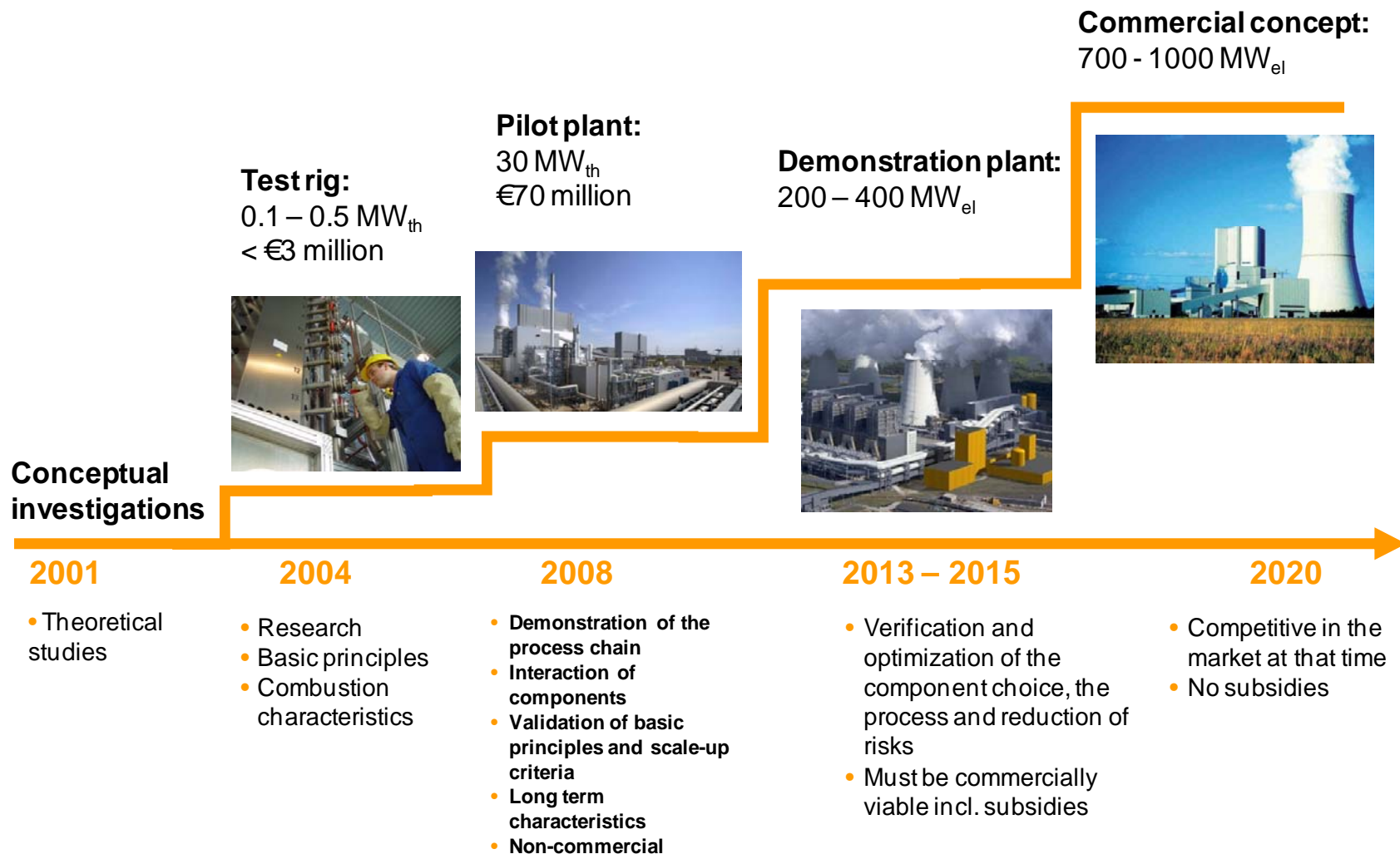
The world will not stop using fossil fuels.

Coal is the one fossil fuel which combines the greatest potential with the strategic optimum
Coal enjoys a global renaissance.

CCS is **THE** key technology for developing a CO₂ lean energy system based on the reality of fossil fuels – especially coal



CCS – Our Roadmap



Oxyfuel Pilot Plant in Schwarze Pumpe



- » operating hours oxyfuel: 3.100
- » operating hours air mode: 1.500
- » hours oxyfuel: 1.600
- » captured amount of CO₂: 1.400 t

Investment: approx. € 70 million plus operating expenses of €10 million € p.a.

Demo Plant Jämschwalde by Numbers



- Existing plant, 3000 MW in total, 6 x 500 MW Units
- Feasibility Study completed (April 2009)
- Installation of two CCS Technologies:
 - Oxyfuel (equivalent to 260 MW_{el})
 - Post combustion capture (equivalent to 125 MW_{el})
- Up to 2.7 million t CO₂ capture p.a.
- Real carbon reduction
- Planning process initiated
- Assessment of various potential storage sites
- Start of operation is planned in 2015

Challenges and Show-Stoppers

Legal and regulatory framework

speedy transposition of EU CCS directive

Financing

Jämschwalde demonstration plant project investment costs ~ €1.500 million

- € 180 Mio: EEPR?
- € ??? Mio: NER300 (Art. 10 a para 8) ETS directive (2009/29/EC)

Acceptance

- role of government/politicians, science & research
- NIMBY, NUMBY, NOMBY, and BANANA

**"Coal is here to stay - either with or without
CCS. We make the difference.,,**

Thank You for Your Interest!