

EURACOAL

European Association
for Coal and Lignite



THE FUTURE OF COAL IN EUROPE

“Future of Miners”
Budapest – 9th – 13th June 2010

Gitta HULIK
EURACOAL

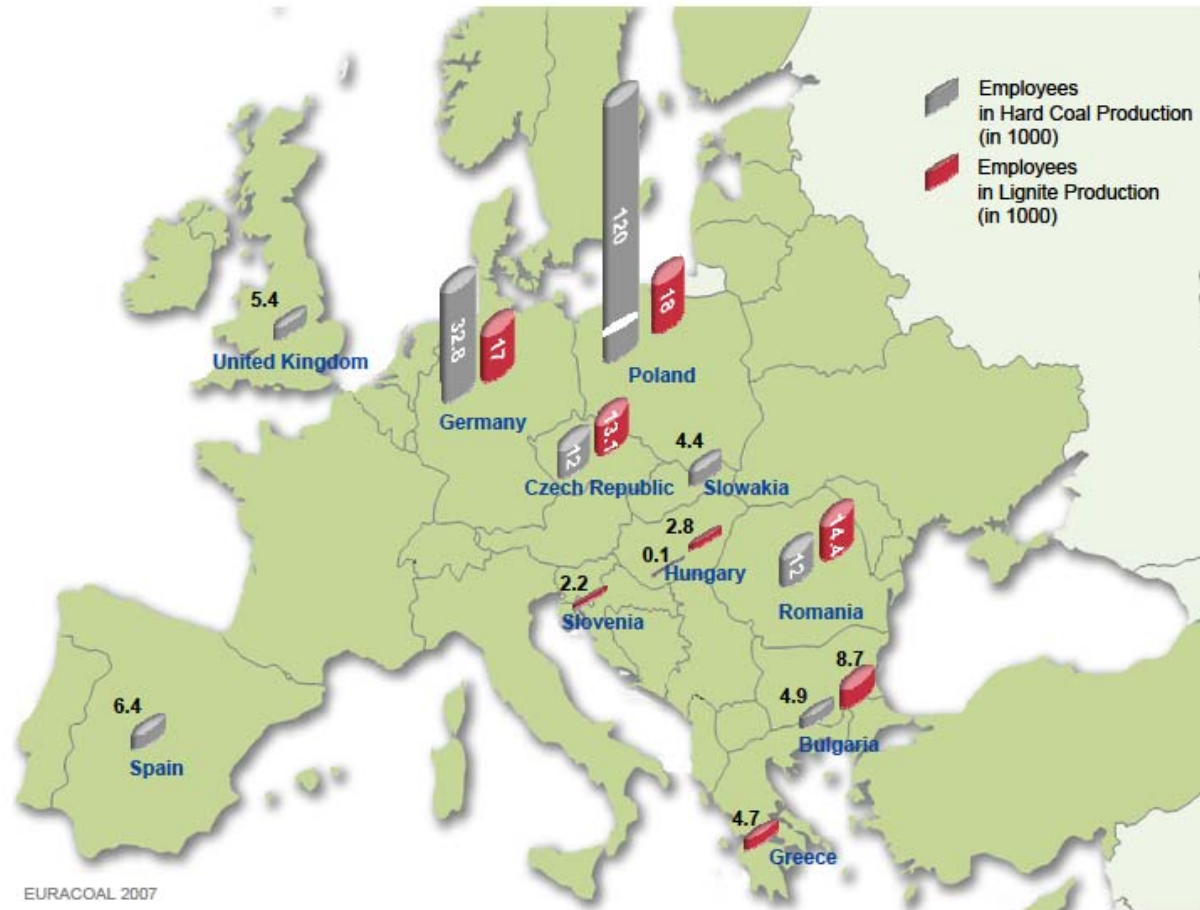
EURACOAL Members

- DEBRIV - Deutscher Braunkohlen-Industrie-Verein e.V. (GER)
- GVSt - Gesamtverband Steinkohle e.V. (GER)
- COALPRO - Confederation of UK Coal Producers (UK)
- ZPWGK - Polish Hard Coal Employer's Association (POL)
- PPWB – Employer's Confederation of the Polish Lignite Industry (POL)
- PPC - Public Power Corporation (GR)
- ZSDNP – The Employer's Association of Mining and Oil Producers (CZR)
- CARBUNION - Federation of Spanish Coal Producers (SP)
- MATRA - Matra Kraftwerk AG (HUN)
- Mini Maritsa Iztok EAD (BUL)
- PATROMIN - Federation of the Romanian Mining Industry (ROM)
- DTEK – Ukrainian Coal Producer (UKR)
- Hornonitrianske Bane Prievidza a.s. (SVK)
- VDKI – Verein der Kohlenimporteure (DE)
- Coallmp - Association of UK Coal Importers (UK)
- Swedish Coal Institute (SWE)
- Premogovnik Velenje d.d. (SLO)
- All-Ukrainian Coal Employers Association (UKR)
- TKI - Turkish Coal Enterprises (TUR)
- EPS - Electric Power Industry of Serbia (SER)
- RMU Banovici Coal Company (BiH)
- Vagledobiv Bobov dol EOOD Bulgarian Lignite Producer (BUL)
- ISSeP - Institut Scientifique de Service Public (BEL)
- University of Nottingham (UK)
- Rock Mechanics Technology Ltd. (UK)
- Coaltrans Conferences Ltd. (UK)
- BRGM – Bureau de Recherches Géologiques et Minières (FRA)
- CERTH/ISFTA – Centre for Research and Technology Hellas/Institute for Solid Fuels Technol. & Applic. (GR)
- KOMAG Institute of Mining Technology (POL)

Current coal-related EU policy issues

- Investment in new and retrofitted coal-fired power plants, if possible CCS ready
- Demonstration of Carbon Capture and Storage (CCS)
- Draft Directive on Industrial Emissions - formerly Large Combustion Plant Directive – 2nd reading in the European Parliament
- Draft Directive on Energy Taxation
- Maintain access to resources for indigenous coal

Coal industry – creating jobs and life quality

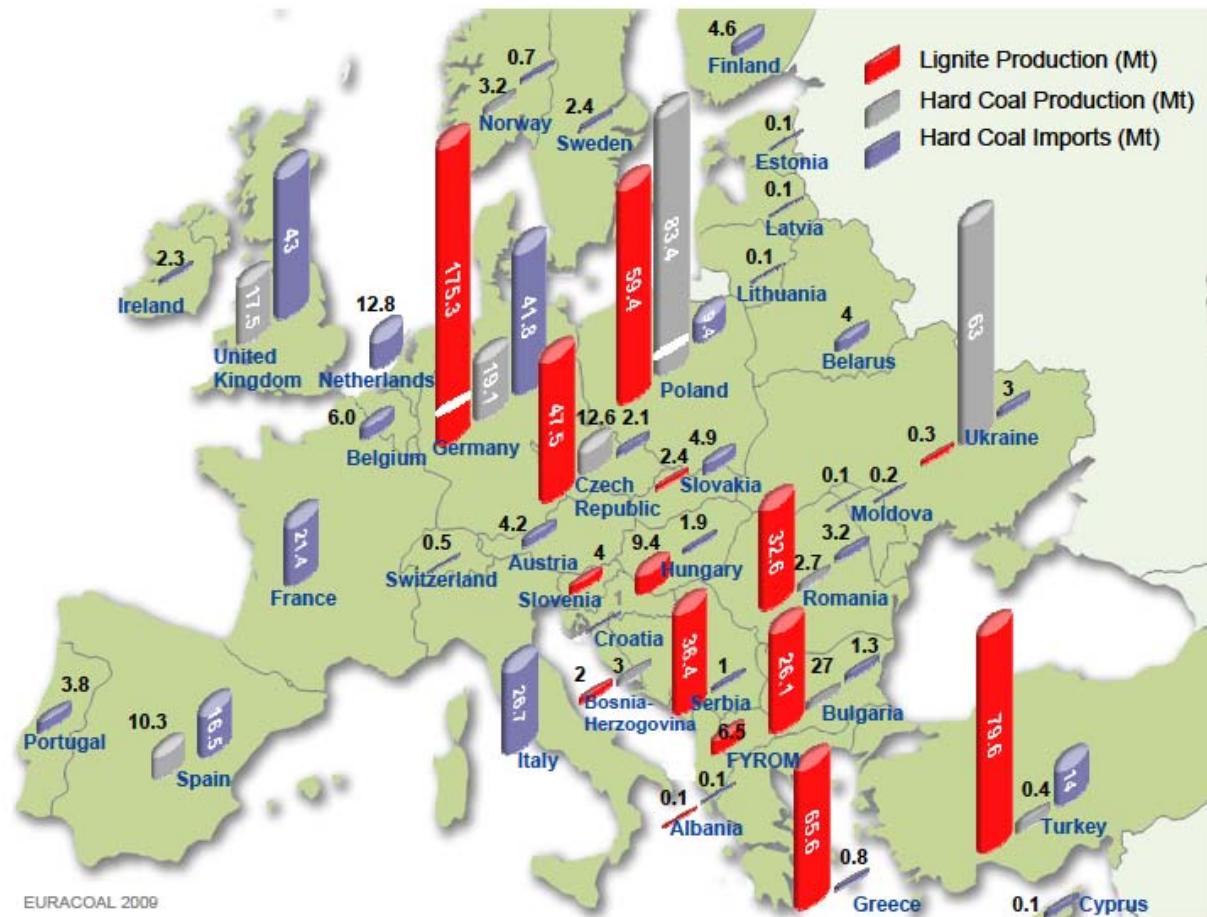


Some 250'000 people work in the coal industry which in total creates some 750'000 jobs in Europe

Why coal?

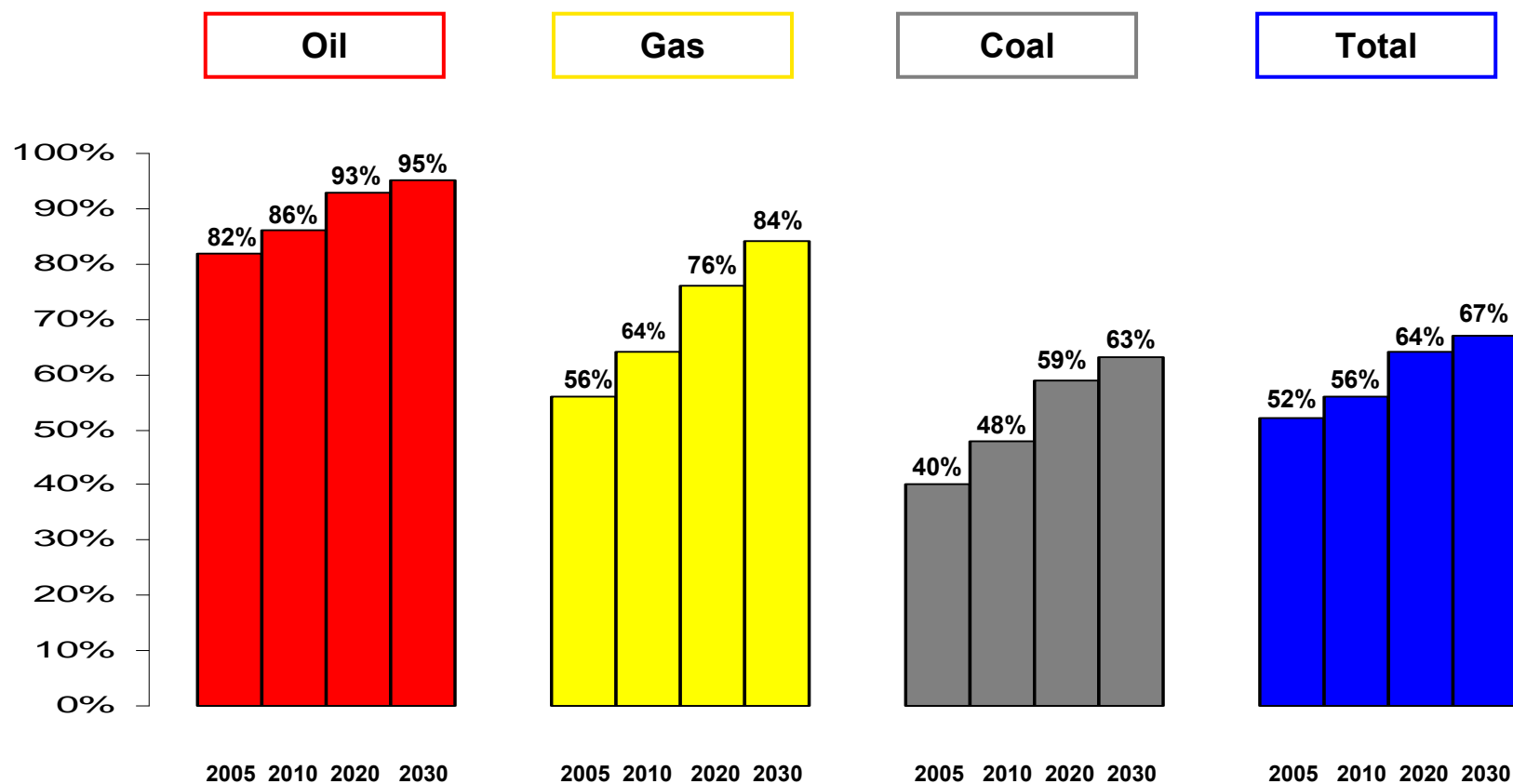
- Hard coal and lignite represent approximately 80% of EU reserves of fossil fuels
- Coal provides safe, reliable, affordable and sustainable energy and will therefore be very much needed in the decades to come. On a global scale coal is and will remain the basis for power generation
- The EU should advocate a balanced energy mix at European and national levels, including a considerable share of coal

Coal production in Europe 2008



Coal contributes to economic prosperity and creates added value in the mining regions

EU import dependence



Source: European Commission, EU Trends to 2030, update 2007

The use of coal reduces import dependence

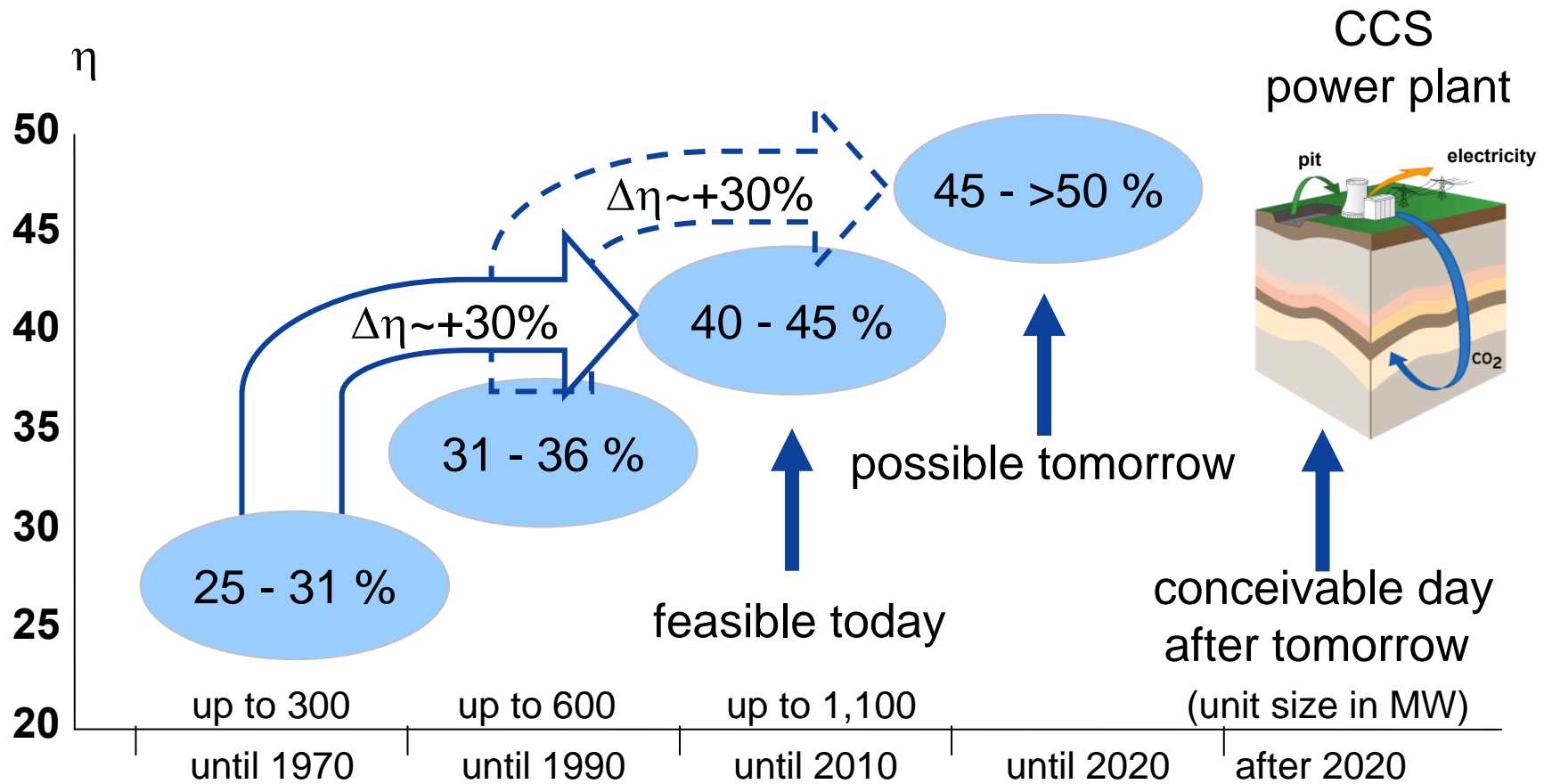
Budapest, 9 – 13 June 2010, Figure 7

EURACOAL

Till 2020 – Are lower emissions from coal possible?

- Coal-fired power plant technology still has substantial potential for development
- Cost-efficient climate protection is already possible today by replacing old, low efficient coal-fired power plants built in the 60s by new highly efficient installations based on BAT which can save one third of the emitted CO₂
- Decision-makers should increase the potential for new coal-fired power plants by creating a stable, long-term framework

Modernisation and increased efficiencies



The right base: continuous power plant modernisation/renewal

Continuous modernisation remains important

Germany – STEAG AG / EVN AG

DUISBURG - WALSUM 10



- New 750 MW hard coal-fired power plant
- Efficiency: > 45%
- 2010

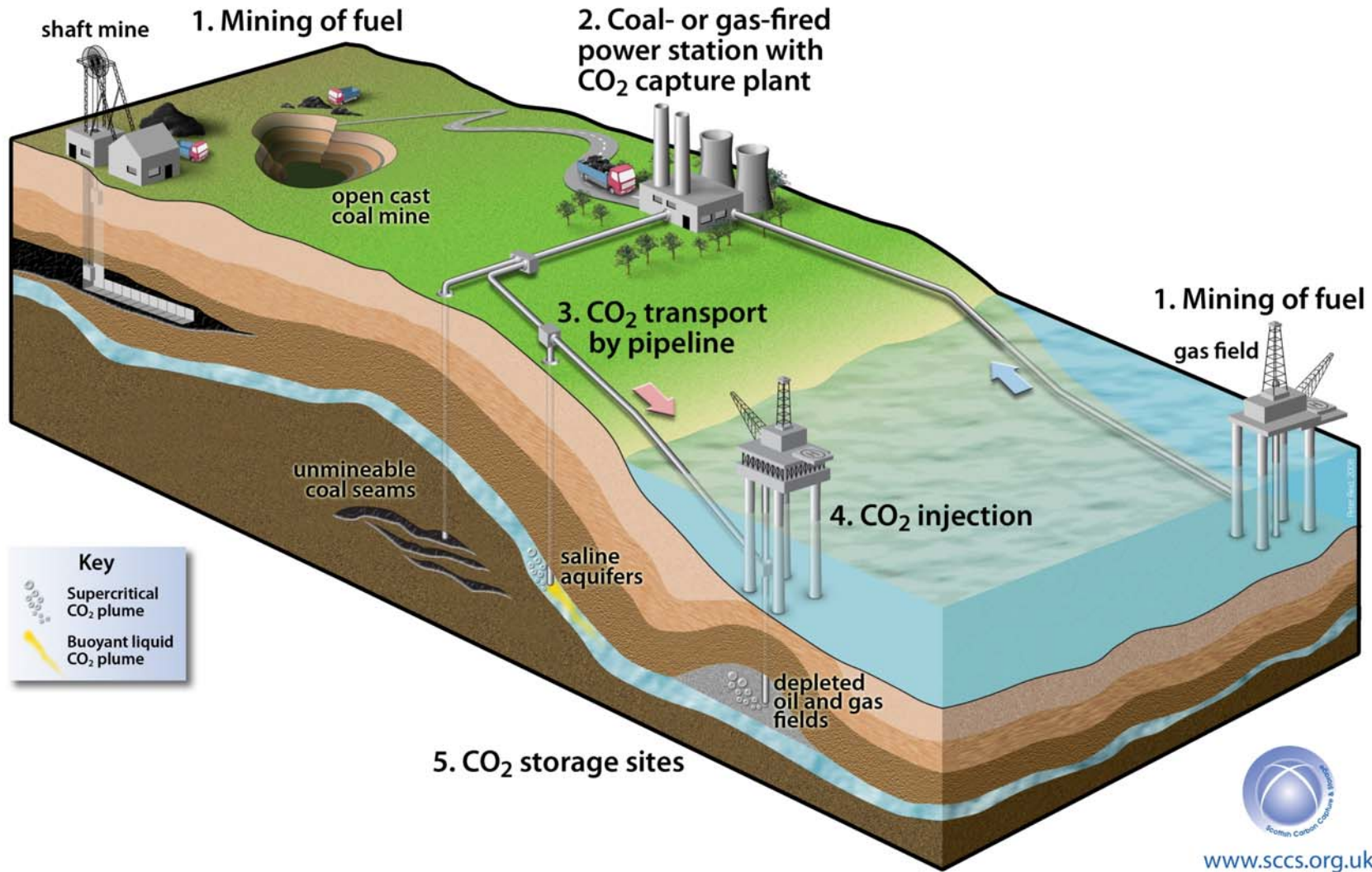


Continuous modernisation and efficiency increase are a precondition for CCS.

Will CCS deliver?

- Carbon Capture and Storage is important for international climate protection policies; it is expected to deliver one fifth of very ambitious GHG reductions by 2050
- For CCS to become commercial in the next decades, an EU CCS demonstration network has to be created in the current decade

Carbon capture and storage – How it works



Germany - RWE and Vattenfall

RWE: CCS DEMONSTRATION PLANT IN HÜRTH



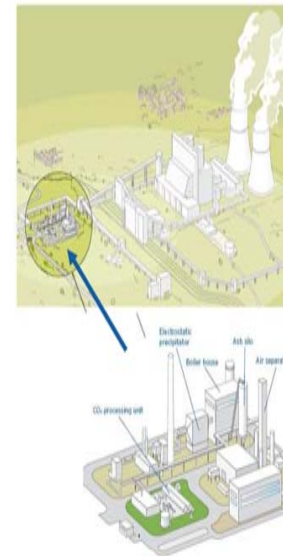
- Basic technology: IGCC (Integrated Gasification Combined Cycle)
- Electr. capacity: 450 MW_{gross}
- Capture rate: approx. 90% of CO₂
- Carbon capture: approx. 2.6 mill. t/a in deep saline formations in north Germany
- Commissioning: End-2014 with optimal underlying conditions

RWE Power has its own power plant and gasification know-how and RWE Dea has the basic know-how required for carbon storage.

VATTENFALL: OXYFUEL PILOT PLANT SCHWARZE PUMPE

Vattenfall 30 MW oxyfuel Pilot Plant in Germany

World's first pilot including the whole chain/components:



Air separation
Boiler 30 MWth
Ash treatment
Electrostatic precipitator
CO₂ processing unit



Poland – BOT and PKE/ZAK

BELCHATOV, BOT, PGE and others



- New 858 MW lignite-based, post-combustion capture, 2015, 1/3 CCS

KEDZIERZYN, Poludniowy Koncern Energetyczny/Zaklady Azotowe Kedzierzyn

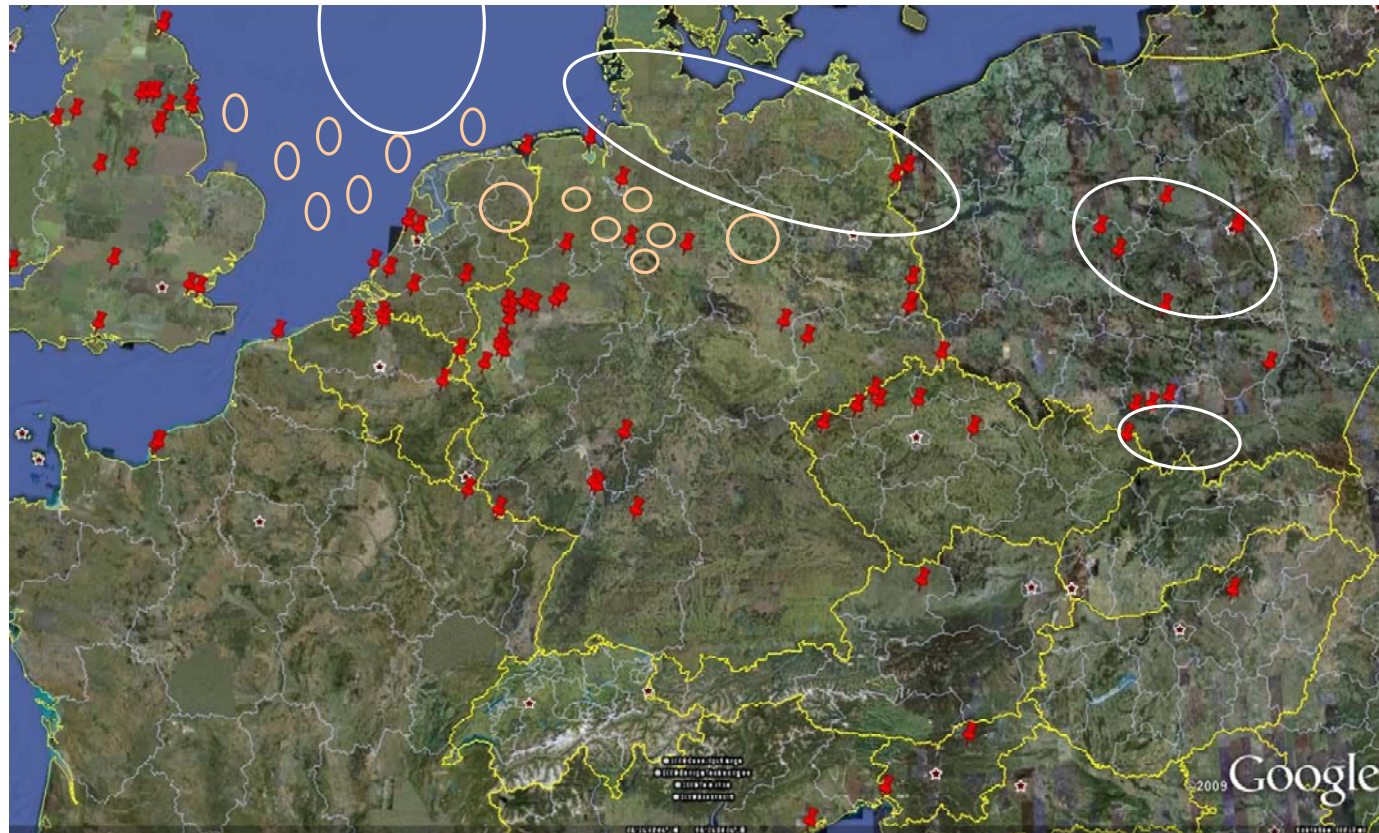
- New 500 MW syngas and 250 MWeI, polygeneration, 2014

CCS infrastructure – Who will take care?

- An efficient and affordable CO₂ transport network can better be established at European than at national level
- The EU should actively promote the creation of a CO₂ infrastructure together with EU Member States; it must be included in the up-coming EU energy infrastructure package


CO₂ sources and potential storage sites


CO₂-Sources > 3 Mio. t/a and potential storage areas




Quelle: EPER 4/2009 – Daten für 2004

Slide 9

 CO₂-Speicherformationen

 Öl-Gas-Felder

 Schwerpunkt
CO₂-Emissionen

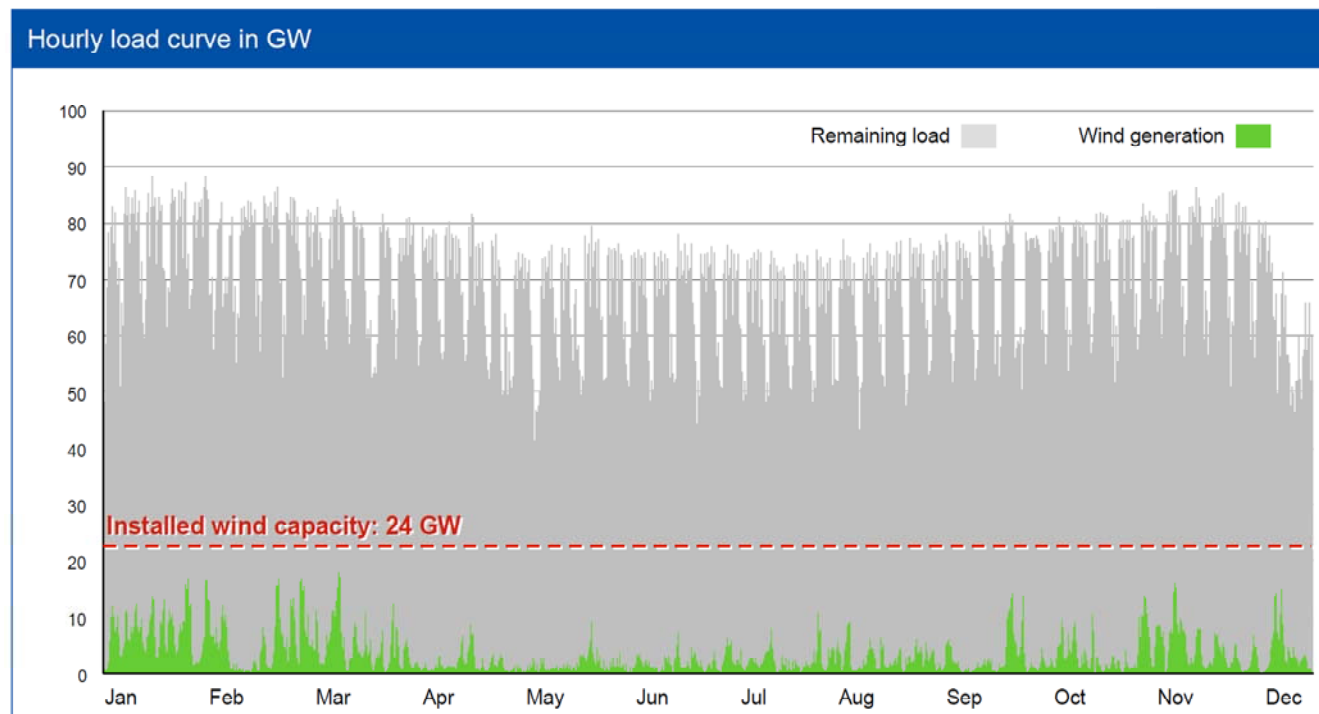


Bundesverband Braunkohle

Coal and renewables – Partners?

- Coal utilisation can co-exist with the development of power generation based on renewables
- New coal-fired power plants will be more flexible and better adapted to cover supply gaps caused by the unstable power production from renewables

Power generation from wind in Germany in 2008



Source: RWE.

Czech Republic - ČEZ GROUP

NORTH BOHEMIA CLEAN COAL PROJECT



- New power plant
- 660 MWe & supercritical steam parameters
- Lignite
- 2015

HODONIN CO2 SEPARATION PROJECT



- Existing power plant
- 105 MWe (2 x FBC, 1996-7)
- Lignite + biomass
- 2015

Combined heat and power – with coal

- A combined heat and power plant (CHP) produces both electricity and heat, thus making maximum use of the energy obtained from the fuel
- Especially in Eastern Europe and in Scandinavia, coal is used in combined heat and power plants. There are opportunities to further extend coal-based CHP and to foster reliable, sustainable and affordable energy production for industry and for households

Combined heat and power plant in North Bohemia

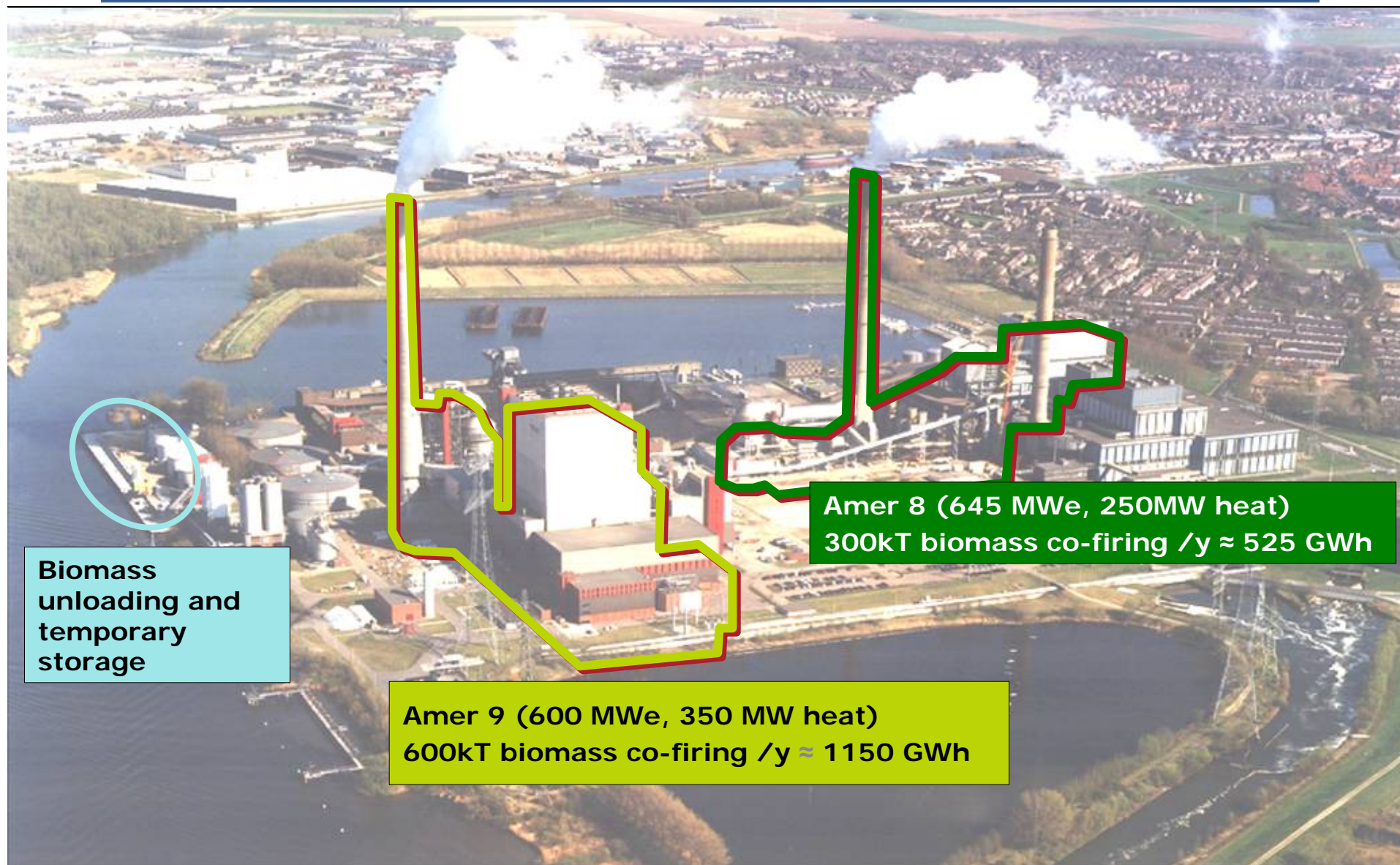


CHP – a stable and affordable fuel for industry and households

With coal – higher efficiency for biomass

- The utilisation of biomass in coal-fired power plants helps to reduce CO₂ emissions, both because less coal is used and also because the efficiency of the used biomass is increased compared to dedicated biomass generation

Amer: the largest European co-firing power plant



Conclusions

- European societies will need hard coal and lignite in their energy mix for decades – coal can contribute to the energy mix due to its vast resources in many EU Member States
- Indigenous coal production demonstrates global best practice for mining, environmental protection and safety at work
- Security of fossil fuel supply and access to resources must therefore stay a priority for future EU energy policies
- New capture-ready power generation capacity helps achieving the climate protection goals and the security of supply objectives

Coal is a part of the solution to Europe's energy policy issues