EURACOAL

European Association
for Coal and Lignite

The Future of Coal in Europe

Helsinki – 18th March 2010

Dr. Thorsten Diercks, Secretary-General

The Future of Coal in Europe

Agenda

- About EURACOAL
- Facts around coal – globally and in Europe
- Major current coal issues in Europe
  - Continuous Modernisation *and* CCS
  - Industrial Emissions Directive
  - Access to Resources
- Outlook till early 2011

EURACOAL's Targets and Tasks

Targets

- Securing coal's position in the European energy mix through appropriate regulations
- Co-operating in achieving equilibrium between
  - energy policy requirements,
  - market and
  - environmental policy initiatives

EURACOAL Members (as at 31/12/2009)

- 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)
- Hornonitrianske Bane Prievidza a.s. (SVK)
- VDKI - Verein der Kohlenimporteure e.V. (GER)
- CoalImp - 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)
- 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)

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European Association for Coal and Lignite
An international association of partners with equal rights

General Assembly

Coal producers, coal-based power producers, coal traders, research institutes

Executive Committee

Discussions, opinion forming, work targets

President: Petr Pudil

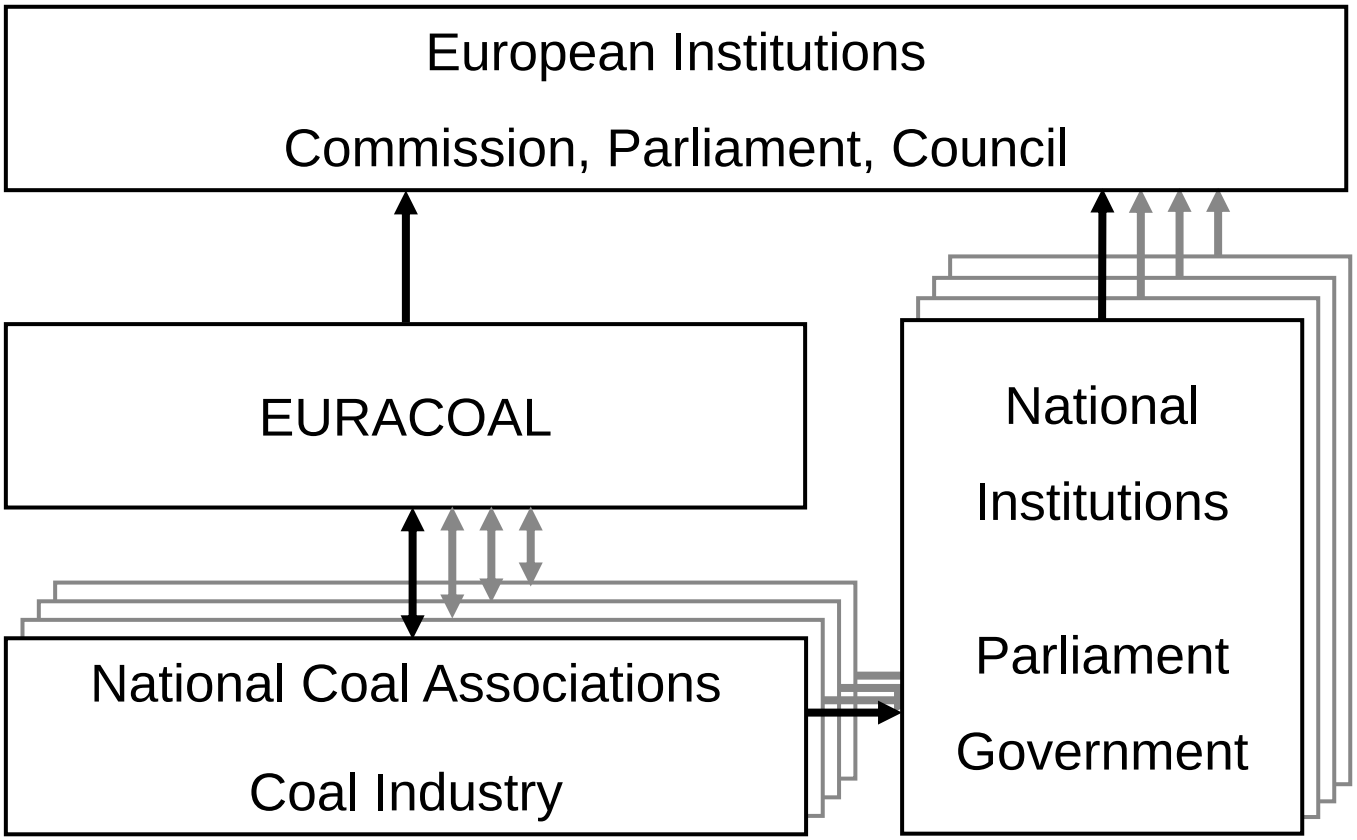
Secretariat:

Secretary-General: Dr. Th. Diercks

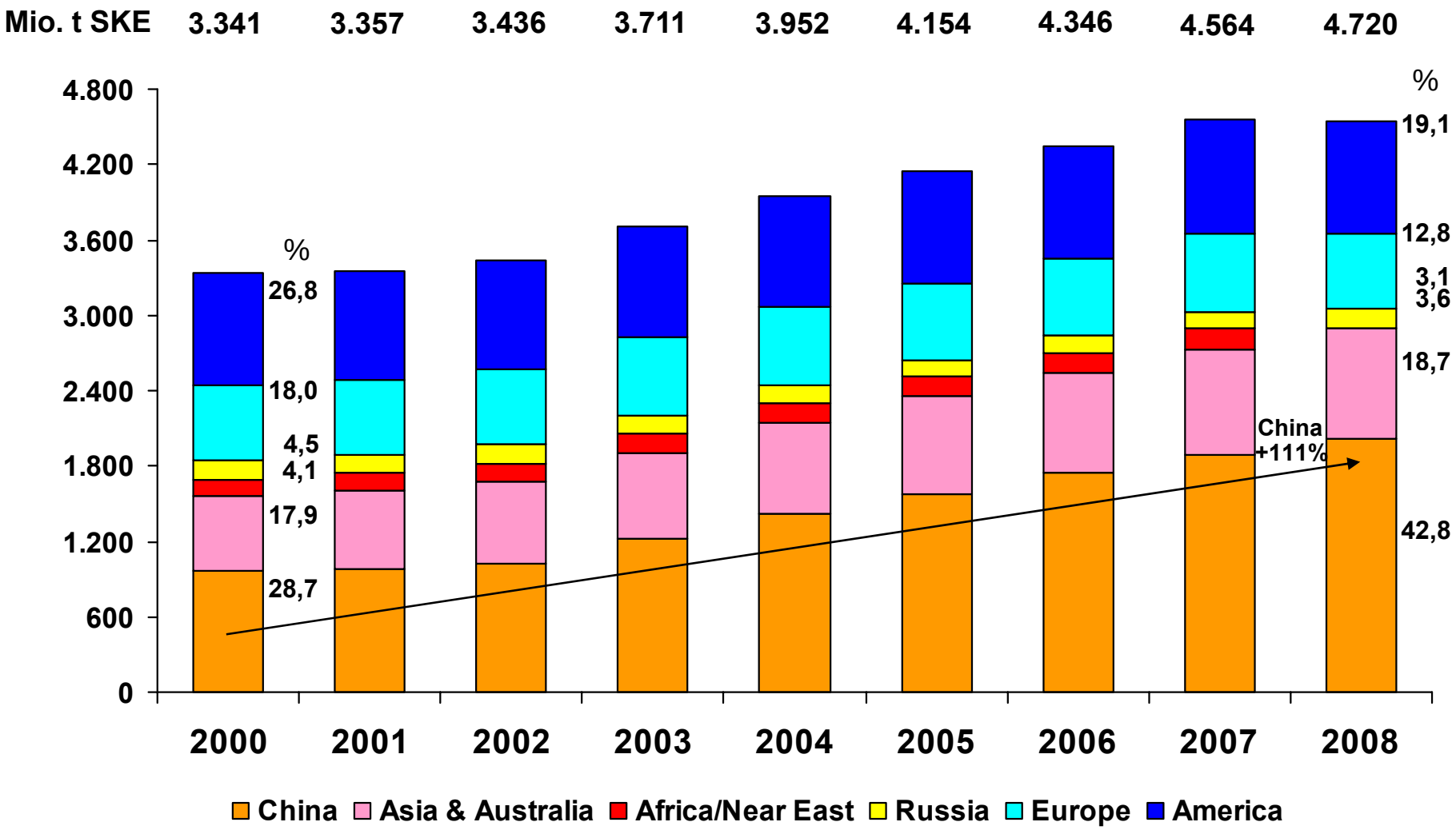
National delegations

Committees:
-Energy Policy Committee:
Dr. George Milojcic
-Technical Research Committee:
Dr. Jürgen Czwalinna
-Environmental Committee:
David Brewer
-Market Committee:
Nigel Yaxley

EURACOAL: Contact Point and Interest Representation of Coal in Brussels



World coal consumption increasing
+ 41 % from 2000 to 2008



Source: BP, Statistical Review of World Energy, Juni 2009

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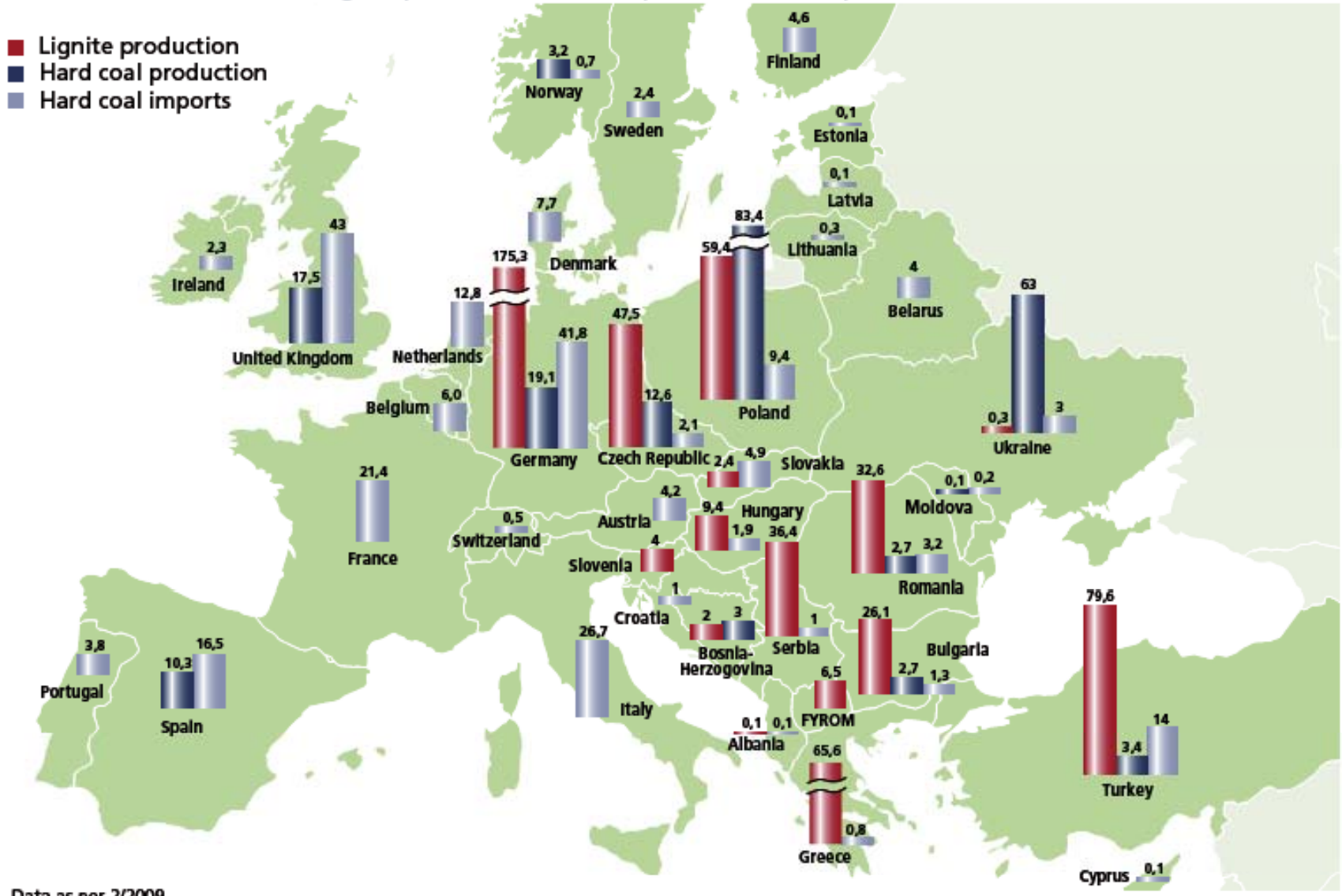
Coal in Europe

Lignite production, hard coal production and imports in Mt in 2008



Data as per 2/2009

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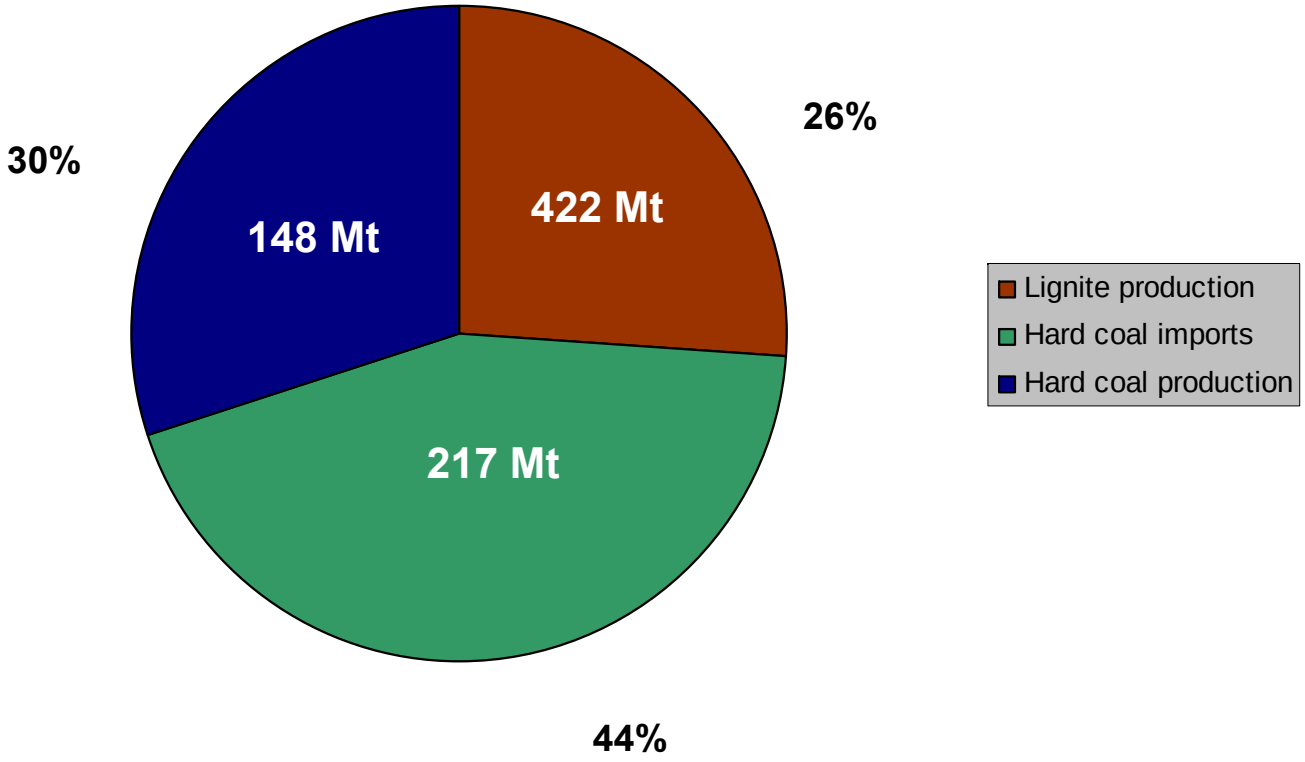
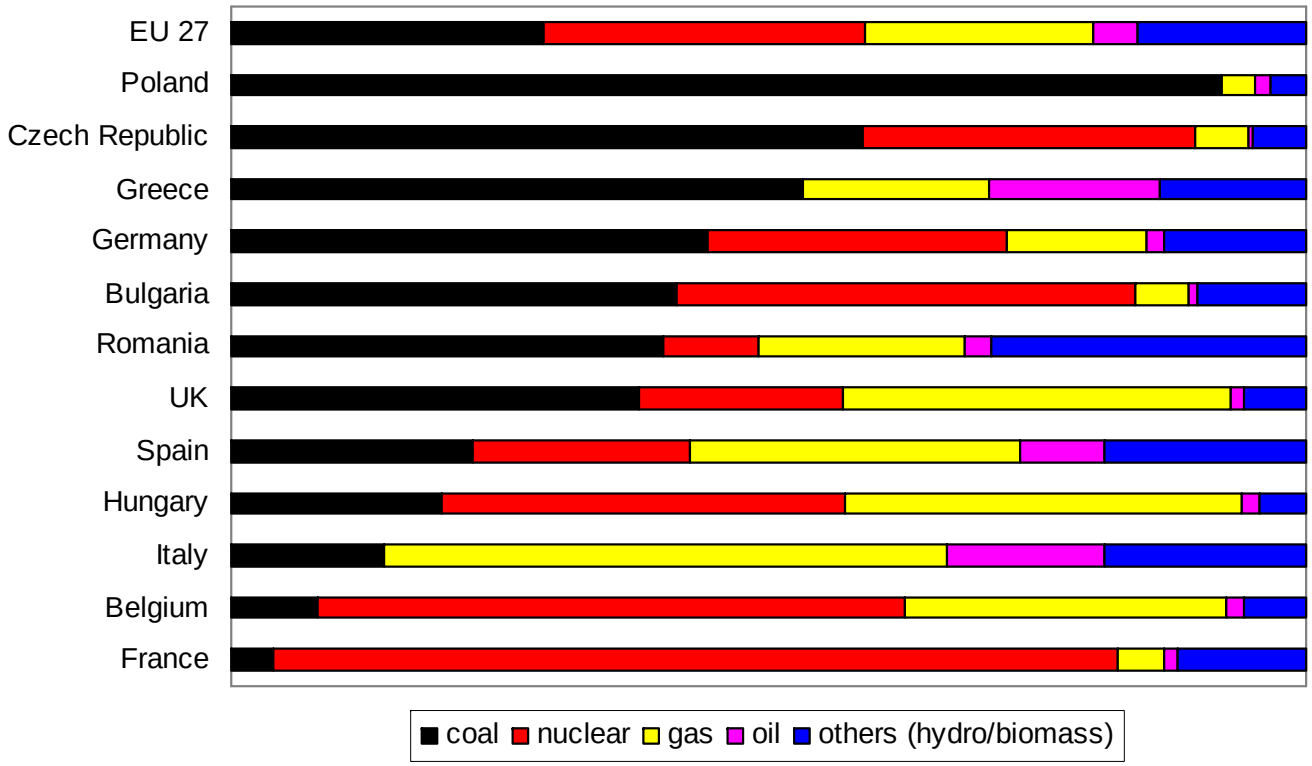
Both imported and indigenous coal make a major contribution to our supply

EU Solid Fuel Supply 2008 (adjusted for calorific value)



Source: EURACOAL

Power generation structure in selected EU 27 Member States



	Gross power generation TWh	Share of coal in %
EU 27	3.357.958	29
Poland	161.743	92
Czech Republic	84.361	59
Greece	60.789	53
Germany	636.600	42
Bulgaria	45.843	41
Romania	62.698	40
UK	398.327	38
Spain	303.007	22
Hungary	35.859	20
Italy	314.122	14
Belgium	85.535	8
France	574.473	4

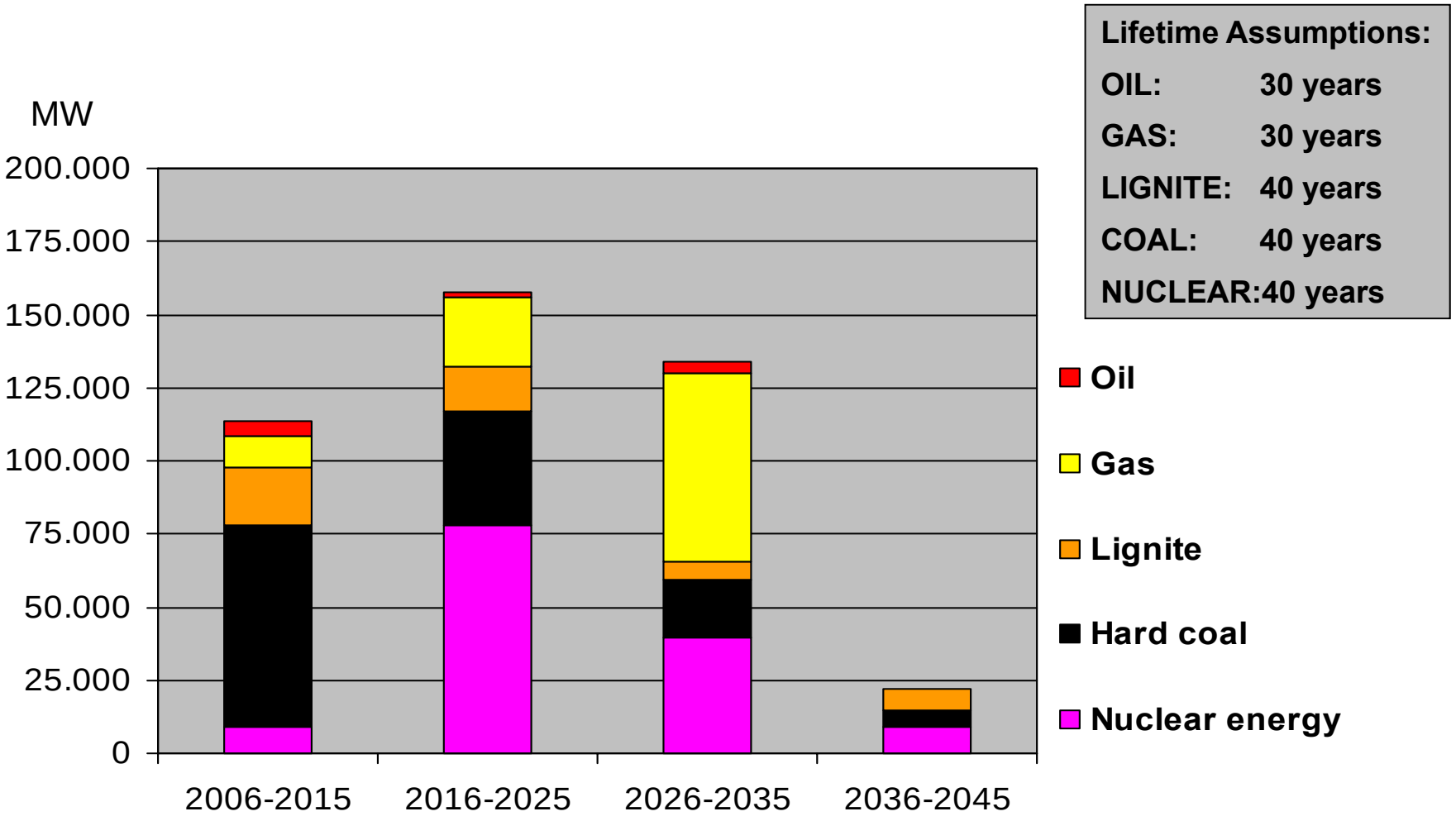
Source: EUROSTAT – Energy / Yearly Statistics 2006

Published 9/2008

Major Current Coal Issues in Europe

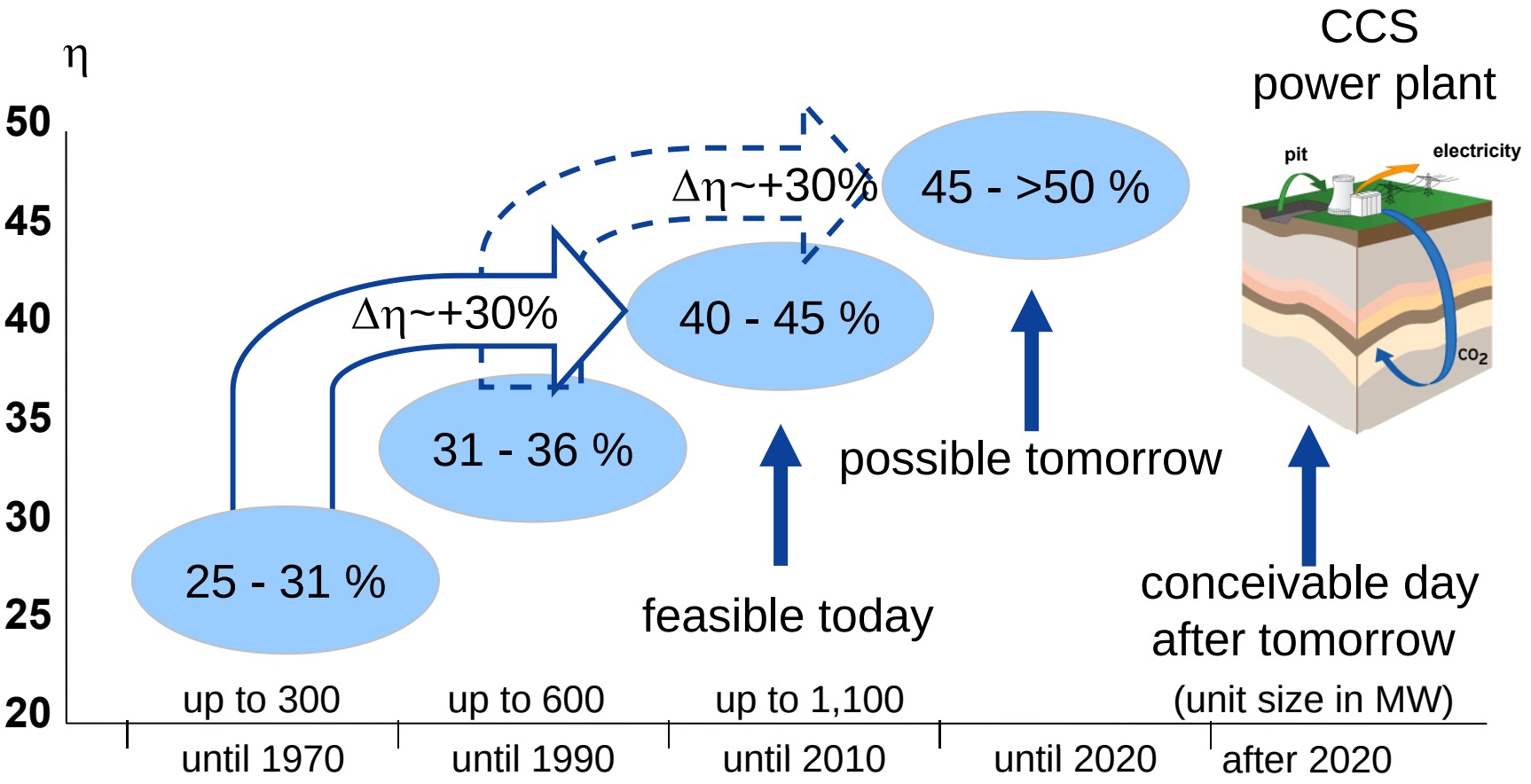
- Investment in new and retrofitted coal-fired power plants, if possible CCS ready
- Demonstration of Carbon Capture and Storage (CCS)
- Draft Directive on Industrial Emissions - formerly Large Combustion Plant Directive – 2nd reading in the European Parliament
- Draft Directive on Energy Taxation
-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

Electricity generation: significant capacity needs to be replaced in the short to medium term



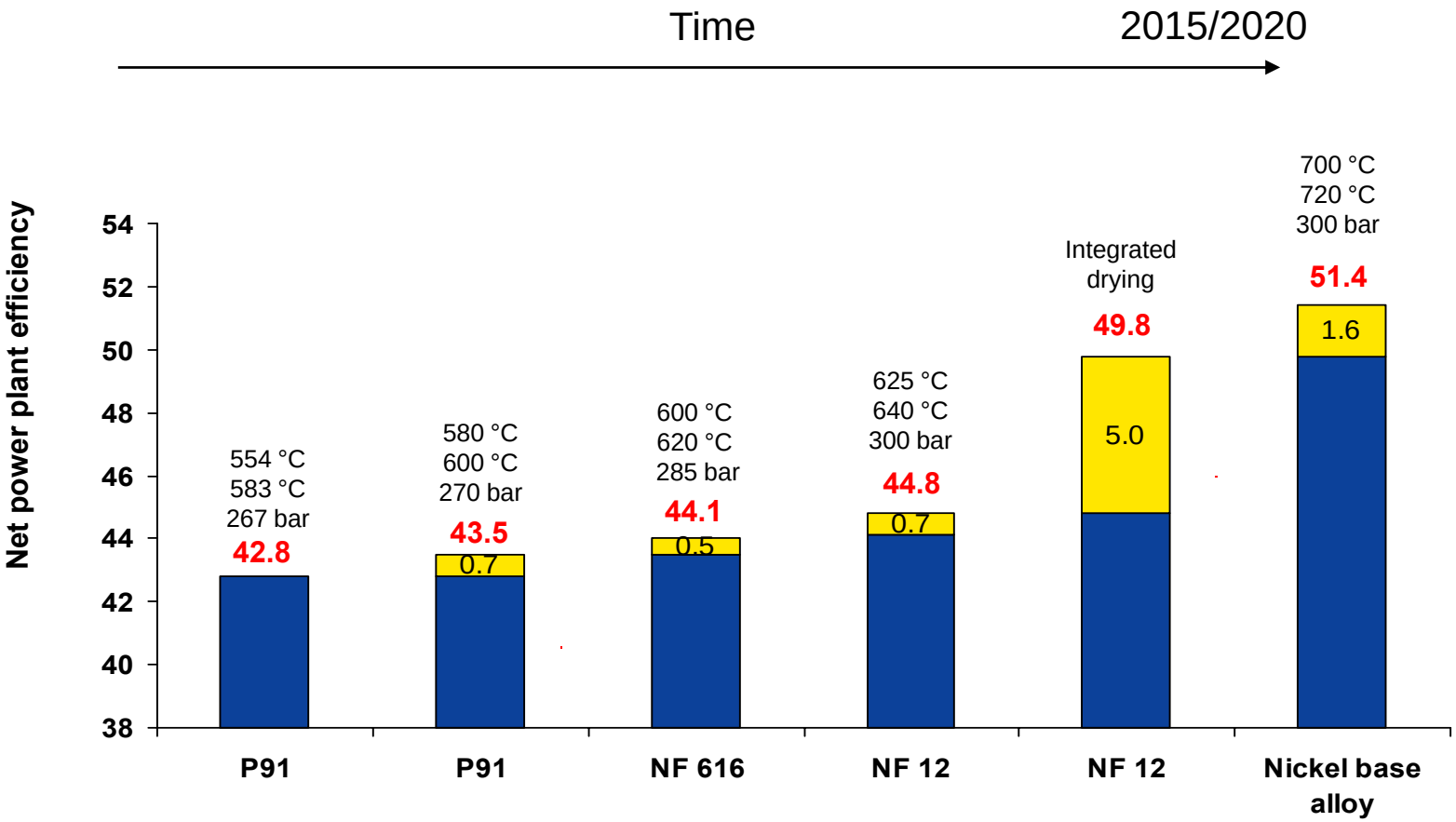
Source: Prognos, EU-25

Important coal policy issues - Modernisation and increased efficiencies



The right base: continuous power plant modernisation/renewal

Power Plant Efficiency Can Be Increased



Source: Vattenfall Europe, efficiency of lignite fired power plants

Continuous modernisation remains important

Germany – STEAG AG / EVN AG

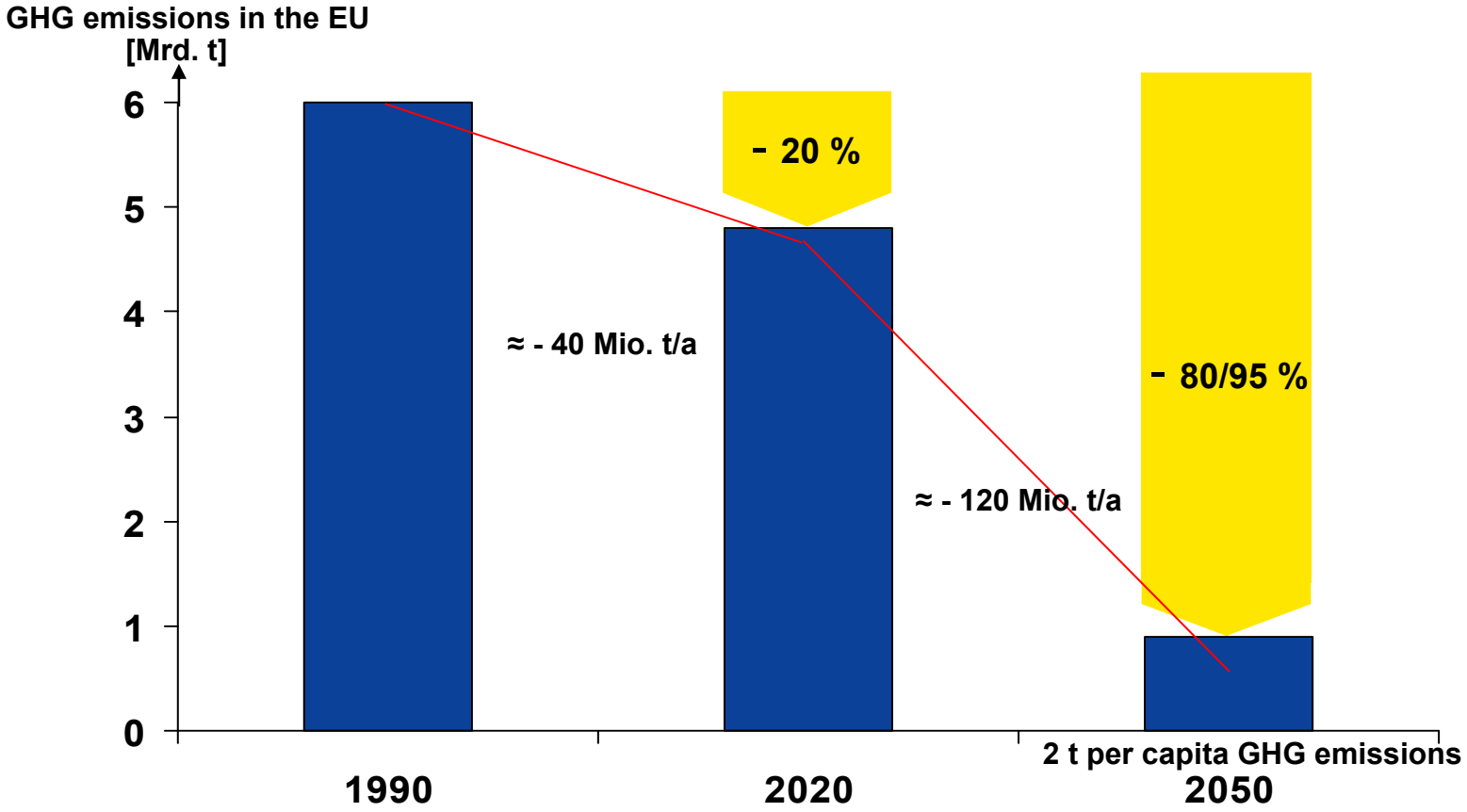
DUISBURG - WALSUM 10

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

Continuous modernisation and efficiency increase are a precondition for CCS.

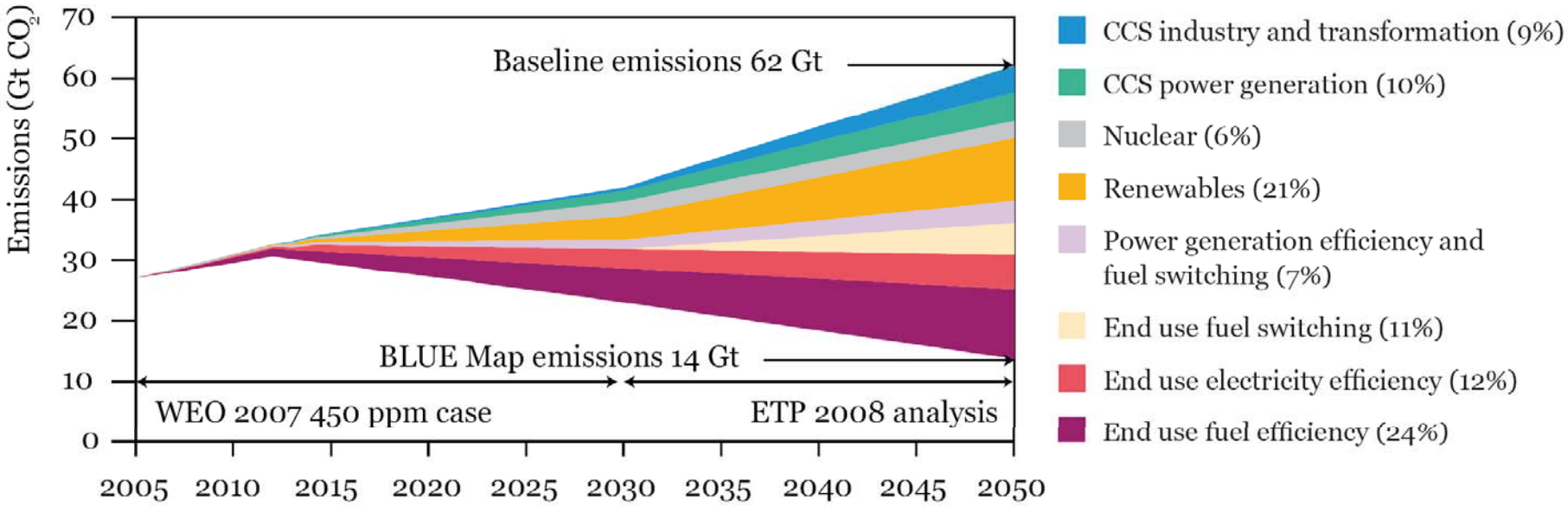
Climate protection in the EU

Two phases – two speeds



Conclusion: For the EU, this means that GHG emissions of 5,8 billion t/a in 1990 must be limited to ca. 4,6 billion t in 2020 and ca. 1 billion t/a in 2050.

CCS – important contribution to CO_2 mitigation



Contribution to 50% emissions reduction by 2050 (BLUE Map Scenario)

EURACOAL on CCS

- CCS is a **highly promising technology** within climate protection policies
- The demonstration **project network** proposed by the Commission and industry / the ZEP Technology Platform must be put into practice as soon as possible, best by 2015
  - Project selection - criteria and modalities to be definitely established by the Comitology procedure
  - Encourage Member States to co-finance the projects from emissions trading auctioning revenues
- Retrofit with CCS after 2020: in some places, top efficiencies may be the best option; any retrofit is subject to proportionality
- Capture-readiness as defined in the CCS Directive is backed

Germany - RWE and Vattenfall

RWE: CCS DEMONSTRATION PLANT IN HÜRTH

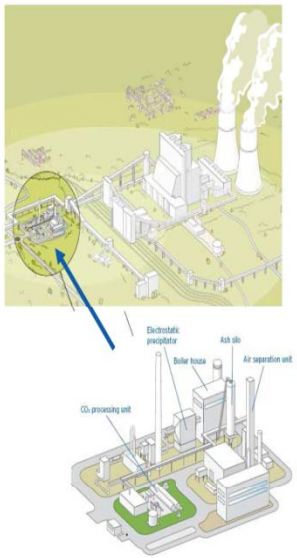
- Basic technology: IGCC (Integrated Gasification Combined Cycle)
- Electr. capacity: 450 MW_{gross}
- Capture rate: approx. 90% of CO_2
- Carbon capture: approx. 2.6 mill. t/a in deep saline formations in north Germany
- Commissioning: End-2014 with optimal underlying conditions

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

Worlds first pilot including the whole chain/components:



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

VATTENFALL

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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

Poland – BOT and PKE/ZAK

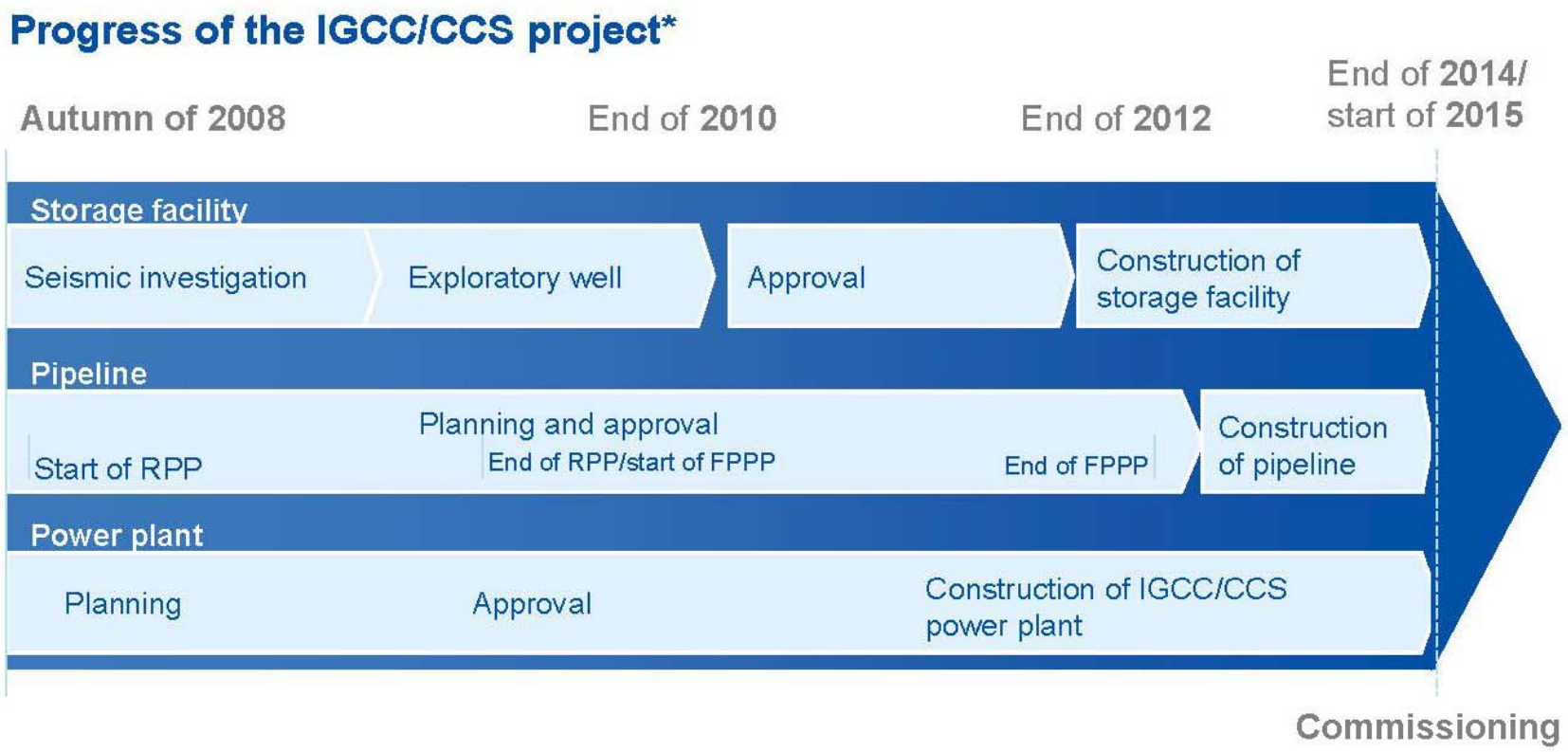
BELCHATOV, BOT, PGE and others

- 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 MWel, polygeneration, 2014

CO_2 transport and storage – CCS depends on approval procedure – RWE example



**Depending on the actual duration of the approval procedures.*
RPP = Regional planning procedure FPPP = formal public planning procedure

CCS – Open Issues

- Technological issues
- Implementation of the CCS Directive into national law
- Financing the CCS demonstration projects and the further development towards market penetration of CCS
- CCS infrastructure, see below
- Public acceptance of CCS

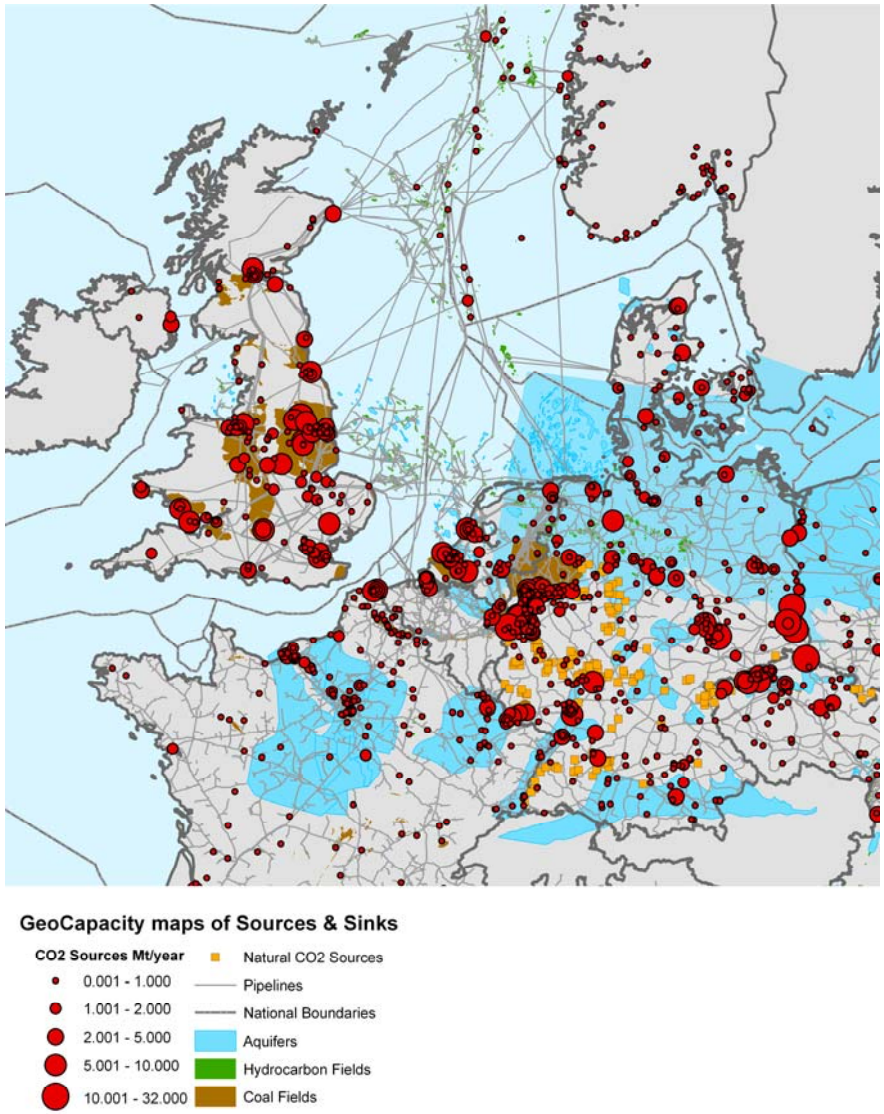
The - 80% and more GHG case

- If climate protection objectives of - 80 % emissions and more are necessary, all fossil fuels are to be used in industrial installations with CCS only
- CCS becomes a general obligation for industry in Europe – step by step between 2020 and 2050
- Operators of installations must pay for capture, transport and storage, regardless of the type of fossil fuel used
- CCS in Europe – 20 million t / year by 2020; quickly rising after that

The Geocapacity project – sources and sinks at different places

Example:

North West Europe



The - 80% and more GHG case

- The CCS infrastructure (transport and storage) is needed by around 2020 - benefits:
  - Transport infrastructure problem solved, it cannot be solved by individuals. Therefore: planning security for CO_2 capture plants
  - Balanced energy mix possible. Therefore: better security of energy supply for the EU
  - A positive production location factor for Europe: industrial activity secured
  - Linking sources and storage sites via infrastructure is economical if quadrupling transport capacity only results in 50 % more costs. Risk of high and / or volatile CO_2 transport prices reduced. Therefore: CO_2 transport costs easier to calculate.

A functioning CCS infrastructure is of general interest.

Industrial Emissions Directive – EURACOAL Position

The Coal Industry fosters four issues

- **Future establishment of ELVs**: The relevant Best Available Technology Documents (BREFs) must observe the investment cycles of the power industry. Existing plants' BAT usually differs from new plants' BAT. Regular upgrading of power plants due to new BREFs to be avoided.

- **Flexibility instruments**: The Council's concept allows for flexibility to avoid security of supply difficulties; including Transitional National Plans. It is a fair compromise – the EP should accept it.

- **Sulphur-rich indigenous coals**: An ambitious desulphurisation rate instead of an ELV.

- **CO_2 ELVs should be rejected:** The EP has already agreed to a review in 2015; no BAT available; double regulation besides ETS.

Access to Resources

Coal extraction: Access to Resources

- Member States should emphasize that ensuring access to resources is a common task of the EU, Member States and industry in order to secure energy supply
  - No hasty closing down of mines on the basis of short-term considerations
  - The legal system must ensure that access to resources (opencast and underground) remains possible also in practice – this refers mainly to regional planning as well as environmental approval procedures

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Thank you for your attention!

Photos courtesy of:

- **E.ON**
- **STEAG**
- **Vattenfall**
- **RWE Power**
- **CEZ**
- **PKE/ZAK**