

CCS – Views by EU Power Industry

Mr. Juho Lipponen
Head of Unit 'Energy Policy and Generation'
EURELECTRIC

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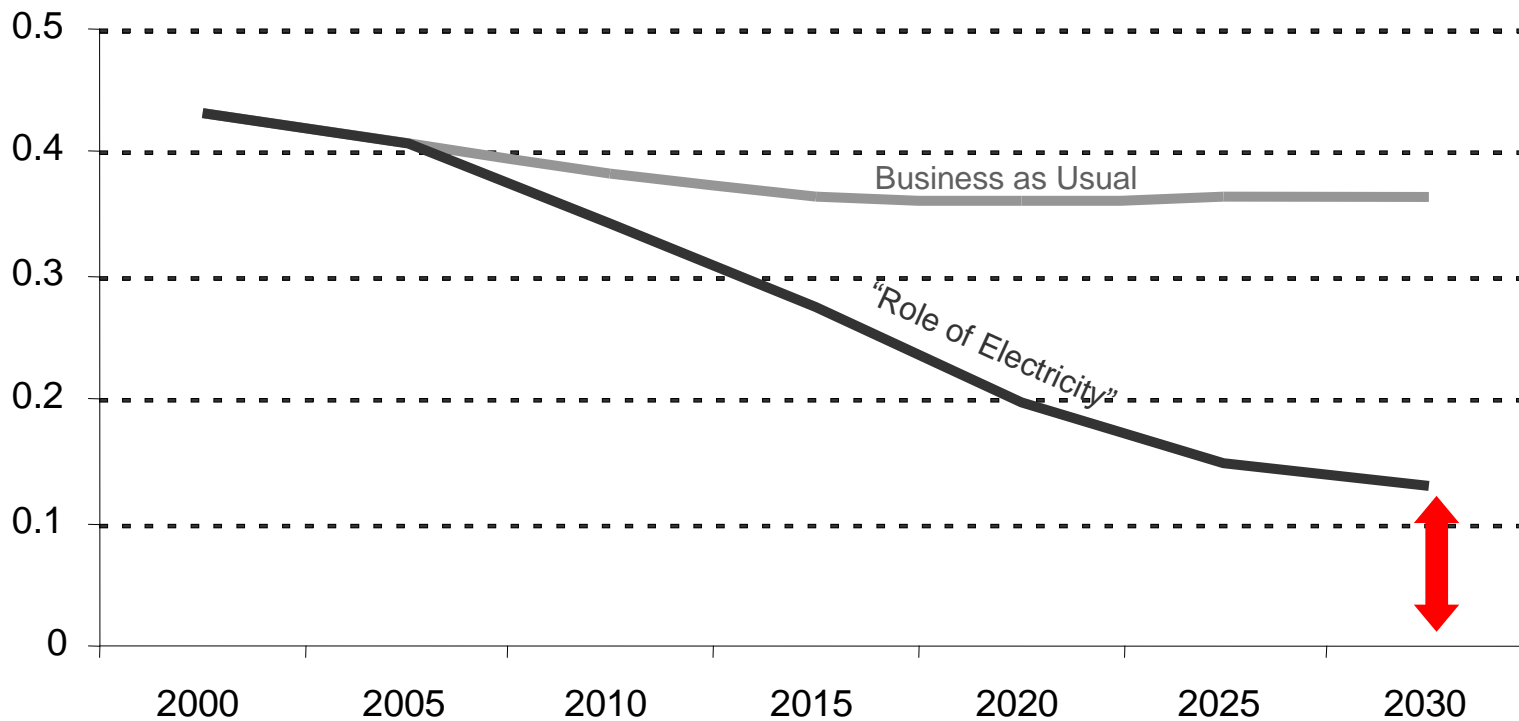
EURELECTRIC

– the association that represents the European electricity industry in the policy-making arena



Vision: carbon-neutral power sector by 2050

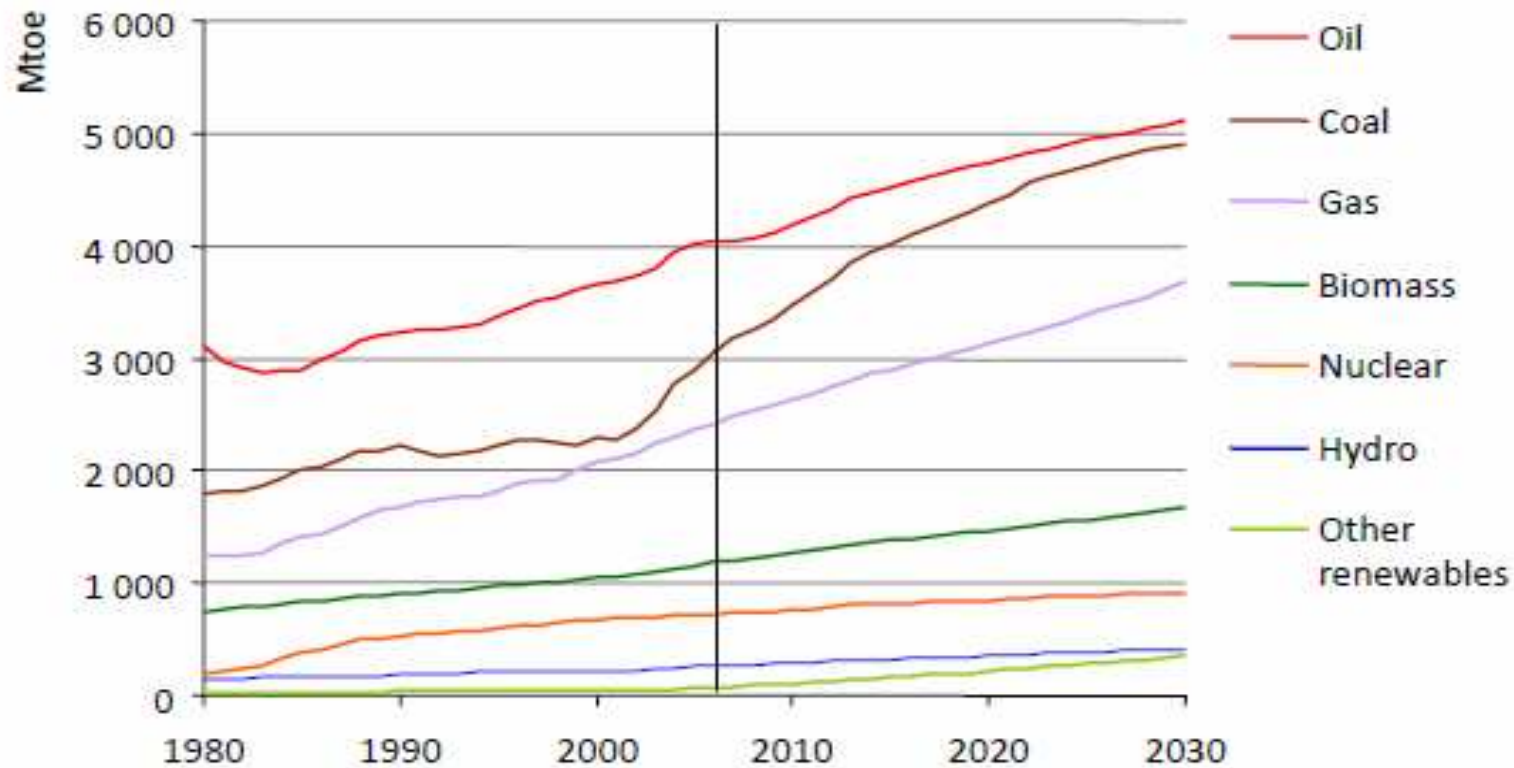
GRAPH: CO₂ emissions t / MWh in EU-27



How do we close this gap by 2050?

World primary energy demand in the Reference Scenario

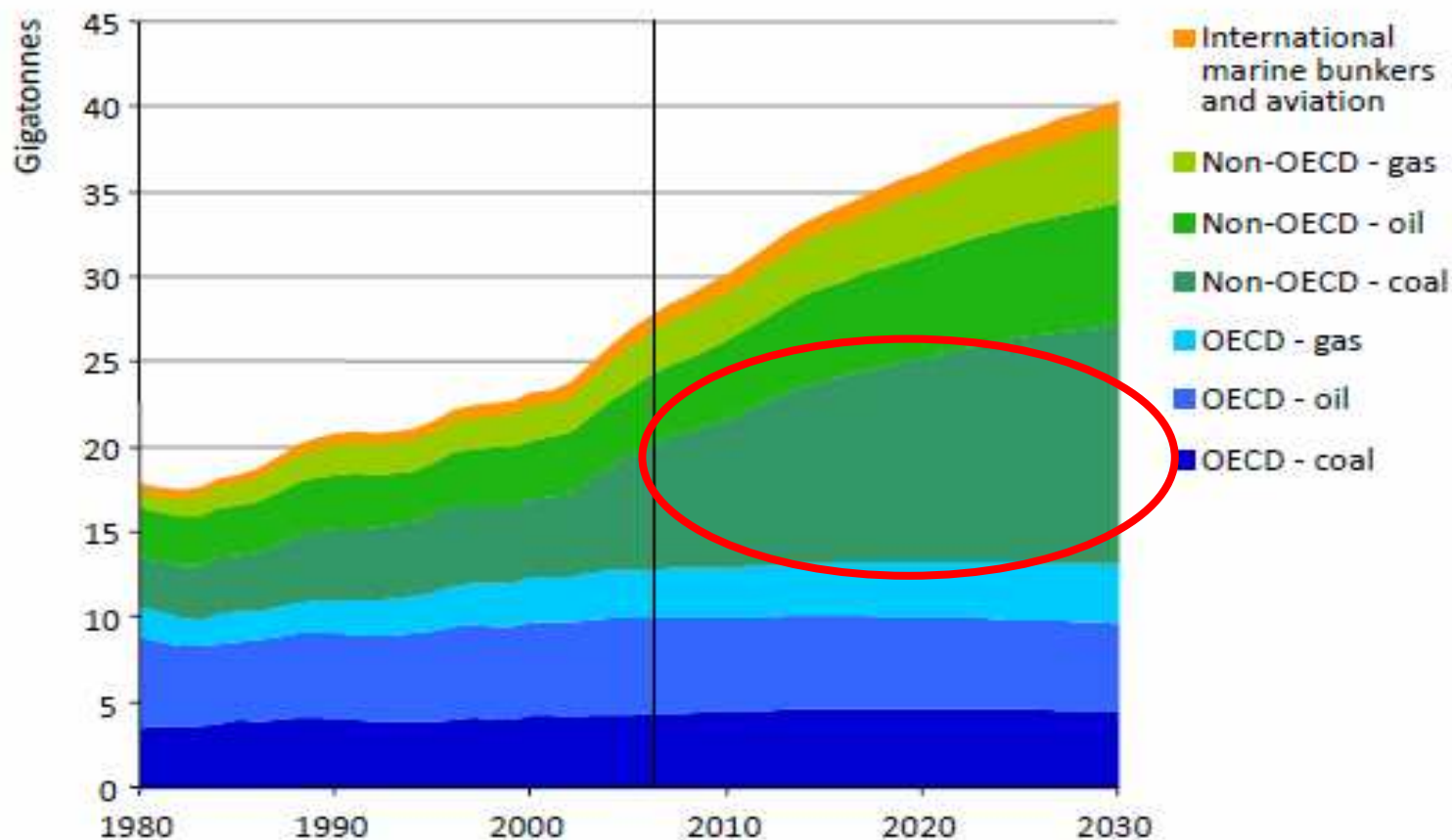
World Energy Outlook 2008



World energy demand expands by 45% between now and 2030 – an average rate of increase of 1.6% per year – with coal accounting for more than a third of the overall rise

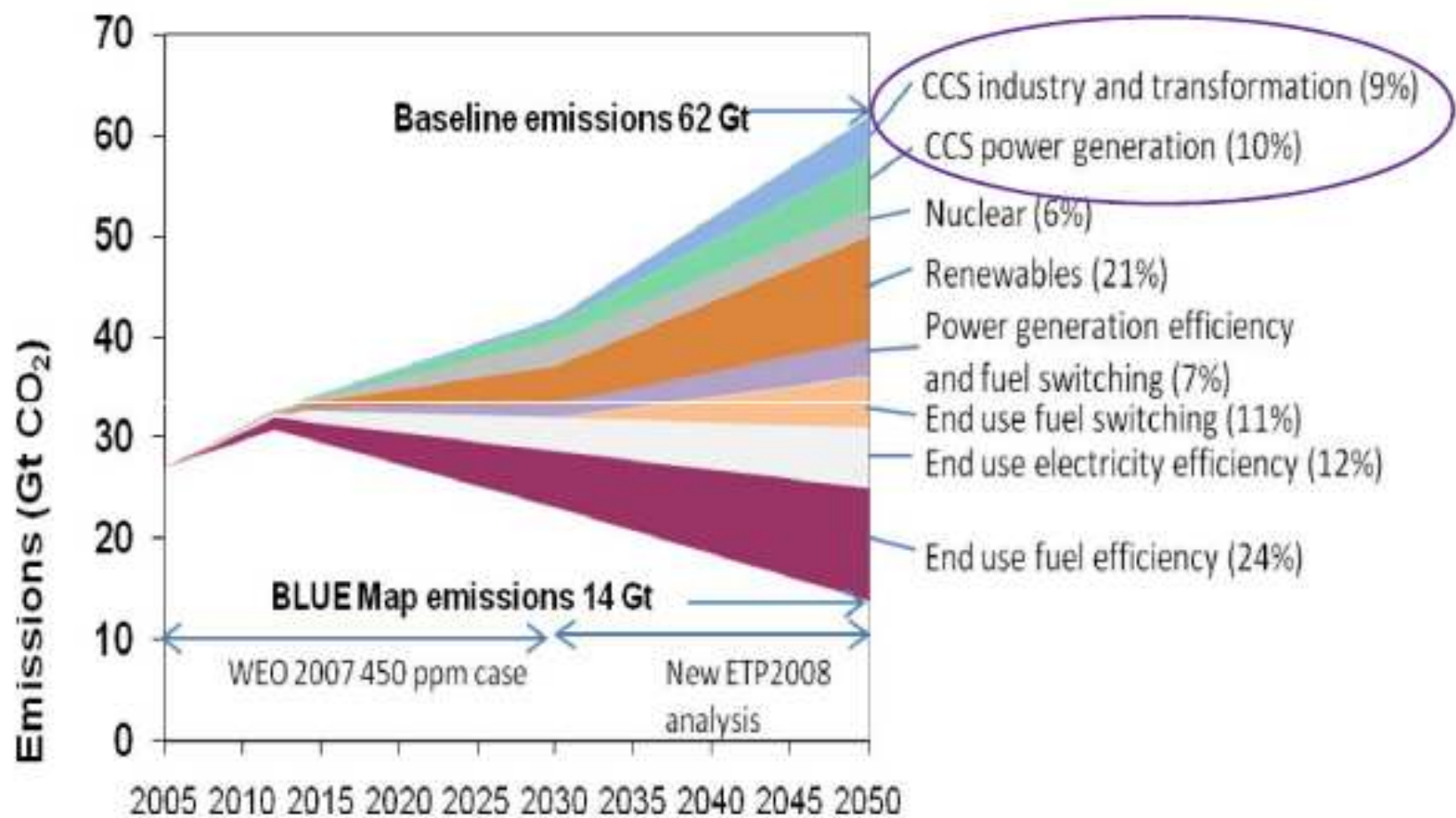
Energy-related CO₂ emissions in the Reference Scenario

World Energy Outlook 2008



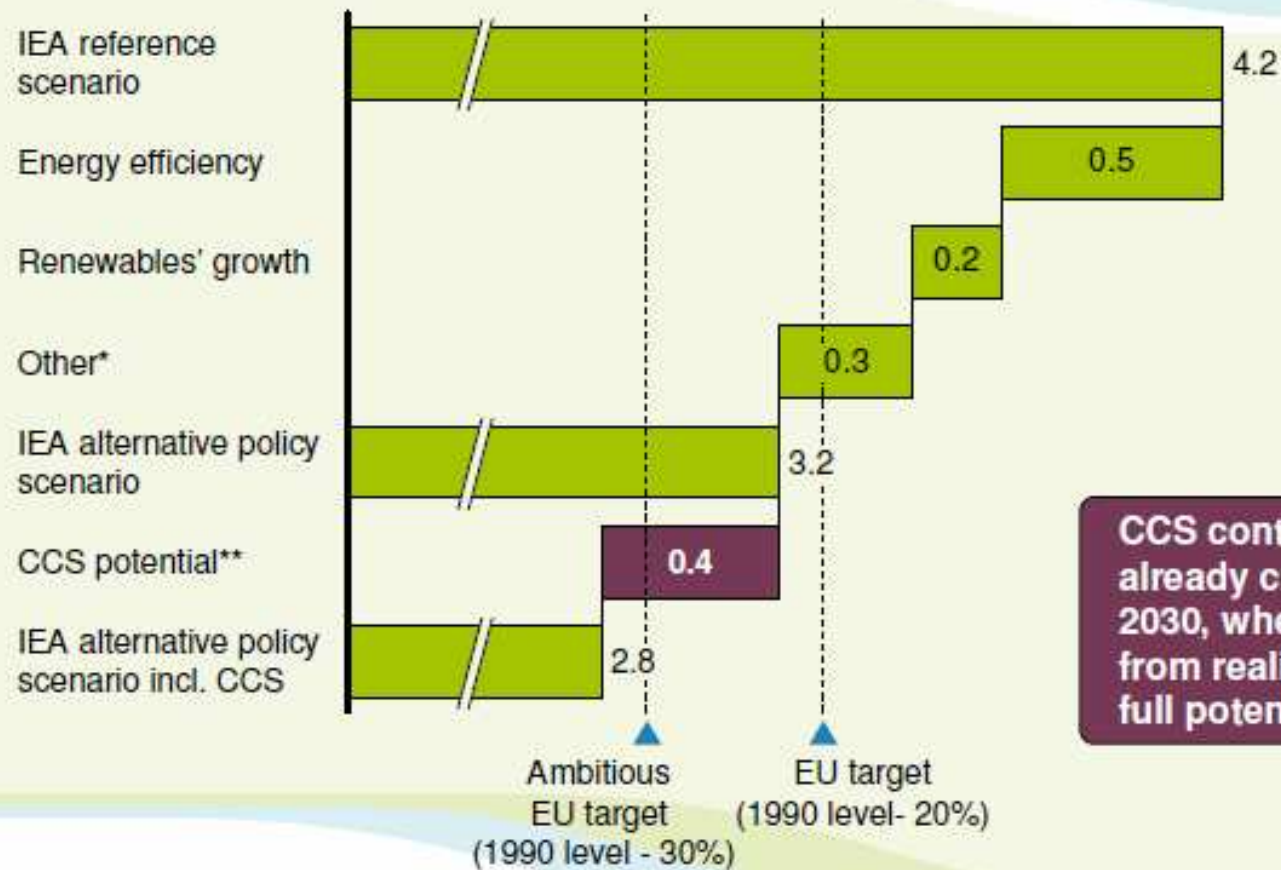
97% of the projected increase in emissions between now & 2030 comes from non-OECD countries – three-quarters from China, India & the Middle East alone

CCS Within a Carbon Abatement Portfolio



CCS is one of the measures required to meet abatement aspirations

EU emissions, Gt CO₂ equivalent/ year, 2030



CCS contribution is already crucial in 2030, when it is far from realising its full potential

* Growth of nuclear, switch to cleaner fuels in both power generation and end use

** As estimated by Bellona in "a Model for the CO₂ capture potential"

Role of CCS in energy security and CO₂ emission reduction

- CCS can play a **crucial role** in any CO₂ reduction scenario towards 2050
- Coal widely available – CCS can benefit **energy security**
- CCS is **one technology amongst others** to combat climate change and ensure supply security
 - A wide portfolio of power technologies is needed
- Full benefit of CCS can only be exploited if the technology is deployed **globally**

EU CCS Directive proposal (23.1.2008)

- Aim: to enable safe transport and storage of CO₂ in the EU
- Capture:
 - CO₂ captured regarded as “non-emitted”
 - New plant to be built “capture-ready”
- Transport:
 - “Fair and open access” to transport and storage sites (= negotiated TPA system)

CCS Directive proposal (23.1.2008) (2)

- Storage:
 - Exploration of storage sites
 - Exploration permits
 - Storage permits
 - Operation and closure requirements (incl. purity of CO₂ stream, leakages etc)
 - Post-closure obligations
 - Transfer of liability to public authorities after closure
- NOTE: EC does not suggest mandatory CCS

CCS legislation: recent developments

- EU Parliament (ENVI Committee): suggestion for emission limit value of 500g CO₂ / kWh for all new electricity generating combustion plant from 1.1.2015
- Effectively imposes ban on new coal plants without CCS
 - Adverse impacts: 1) old installations being kept in operation for longer and 2) increase in import dependency
- Suggestion to use up to 500 million EUAs for CCS demonstration funding
 - Number will be brought down significantly (100-200 million?)

... but legislation alone not enough:

- Need to demonstrate CCS technology on large-scale
- Relevant stakeholders formed “ZEP Platform”: striving to make CCS commercially available by 2020
- European demonstration programme: to exploit European synergies for demonstration
- Demo financing has become a key issue for discussion

Cost of a European CCS demonstration programme

- Exact costs of a programme difficult to define

Rough estimate of costs of a 12-plant demonstration programme:

9 billion €*

* Additional cost to underlying power plant, 300MW size, NPV of overnight investment cost plus extra operating cost over a 15-year period

General principles for CCS demo funding mechanisms

- Any EU support should be **complementary** to national and private sources
 - EU Industry: 11 billion € commitment
- A diversity of technologies, based on **economic and technical** criteria
- Support should be **time-limited**
- Support should be allocated on a **competitive** basis
- **Sharing of knowledge** should be a criterion for funding

Possible EU-level funding mechanisms

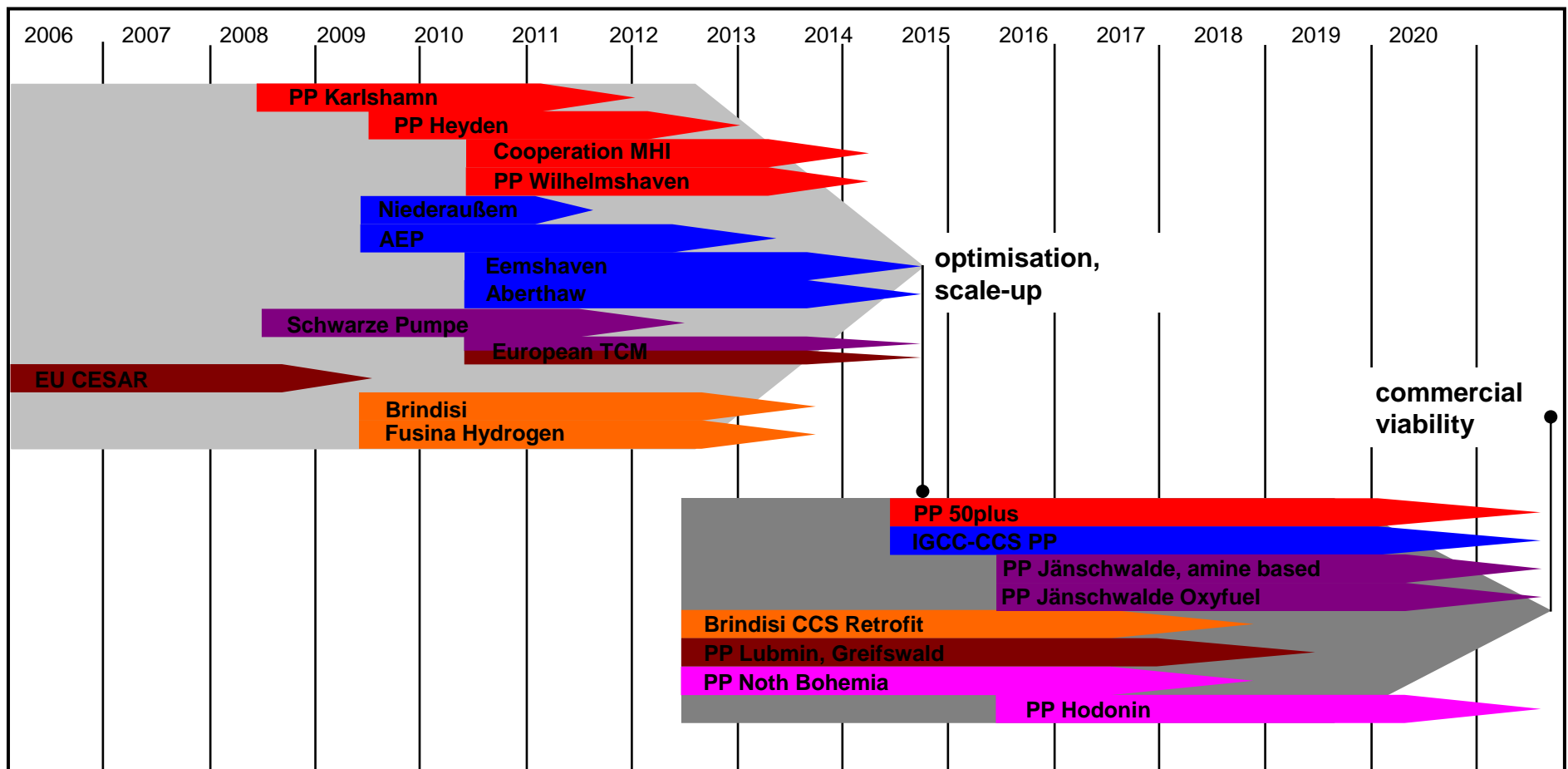
1. Range of EU funding instruments, EBRD, EIB etc.
2. Earmarking of **EU-ETS auctioning revenues** as proposed by the Commission
3. Earmarking of allowances from the **New Entrants' Reserve**, distribution via competitive bidding via:
 - Direct financial support from central auctioning of allowances (“fund approach”), or
 - Handing out allowances

CCS: industry is planning ahead

- All major players have announced their intention to build CCS demonstration facilities and to commit resources
- All technologies being evaluated
 - Post-combustion
 - Oxyfuel
 - Pre-combustion
- “TP ZEP”: Industry and other stakeholders discuss together the R&D, demonstration and policy requirements

CCS Screening

Overview of CCS Pilot and Demo Project activities



Concluding remarks

- CCS can play a crucial role in energy security and in CO₂ emission reduction
- CCS is one of several available options
- Ambitious legislative programme going on in EU: EURELECTRIC lends its general support, except for emission limit values
- CCS does not come for free: need a comprehensive demonstration programme
- Public acceptance has to be tackled

...Coal has a future – CO₂ does not!

Thank you for your attention!

jlipponen@eurelectric.org

Tel: +32 2 515 1014