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The role of subsidies to facilitate transitions to low carbon technologies. Case study CCS

Climate Policy Initiative (CPI) Launch Event

„The Road to Copenhagen"

Felix Chr. Matthes

Berlin, 12 November 2009

Transition to ultra-low-carbon economies
Increasing role of complex systems

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- **Complex systems play an crucial role in ambitious climate policies**
  - Electric mobility ↔ fundamental changes in the electricity supply systems (renewable energies, decentral load management, etc)
  - Decarbonzation of (freight) transport systems ↔ availability of sustainable biomass
  - CO2 capture and storage ↔ capture, transport & storage
  - etc, etc
- **Climate policy strategies and implementation policies and measures must reflect these complexities**
- **CCS is an interesting case study on this**

CCS in the comprehensive policy mix

$T \cdot (I^2+C) \cdot I \cdot m(F,L,P) + s(B,P,T) + (I_i+M_i)$

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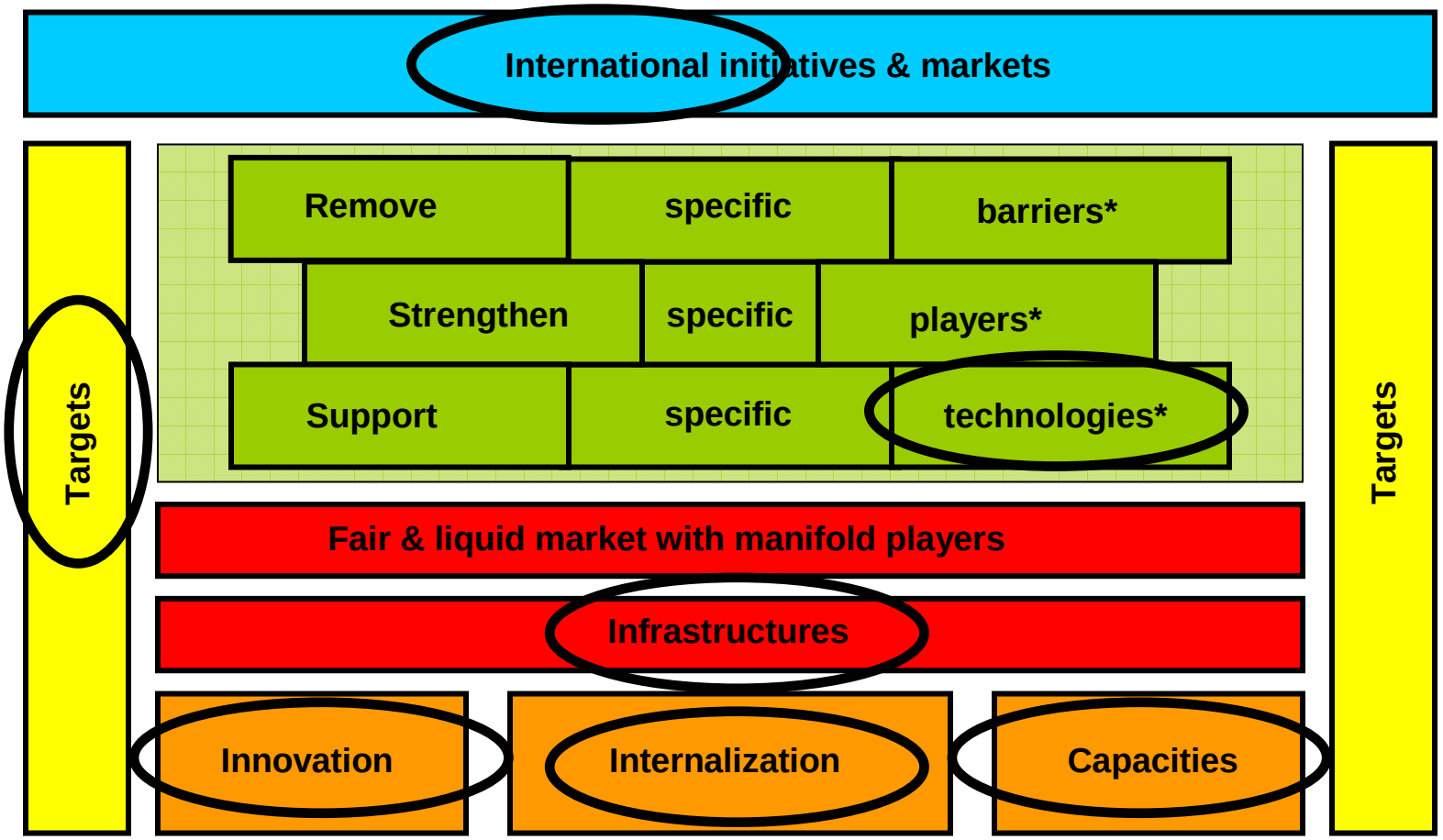

* Evaluate, modify & eliminate specific policies, if necessary

CCS – CO_2 Capture and Storage
Its role in ambitious climate policy

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- **Decarbonisation of fossil fuel use**
  - "Residual" supply from fossil fuels (capacity, energy, competitiveness, grid stability, energy security, fallback, etc.)
    - OECD, EIT und DC
    - Coal and gas
- **Process emissions**
  - Iron & steel, cement (DE ~ 80 Mt CO2, globally 2.5 Gt CO2)
  - There is no alternative (for some processes)
- **Additional net sinks**
  - Biomass & CCS = net sinks
  - Power sector, biofuel production
  - Could avoid the LULUCF switch from sinks to sources (DE ~2005)
  - There is no alternative
- **Abatement potential: DE ~150 Mt CO2, global 5…10 Gt CO2**

EU ETS and power prices
Building the economic case for CCS?

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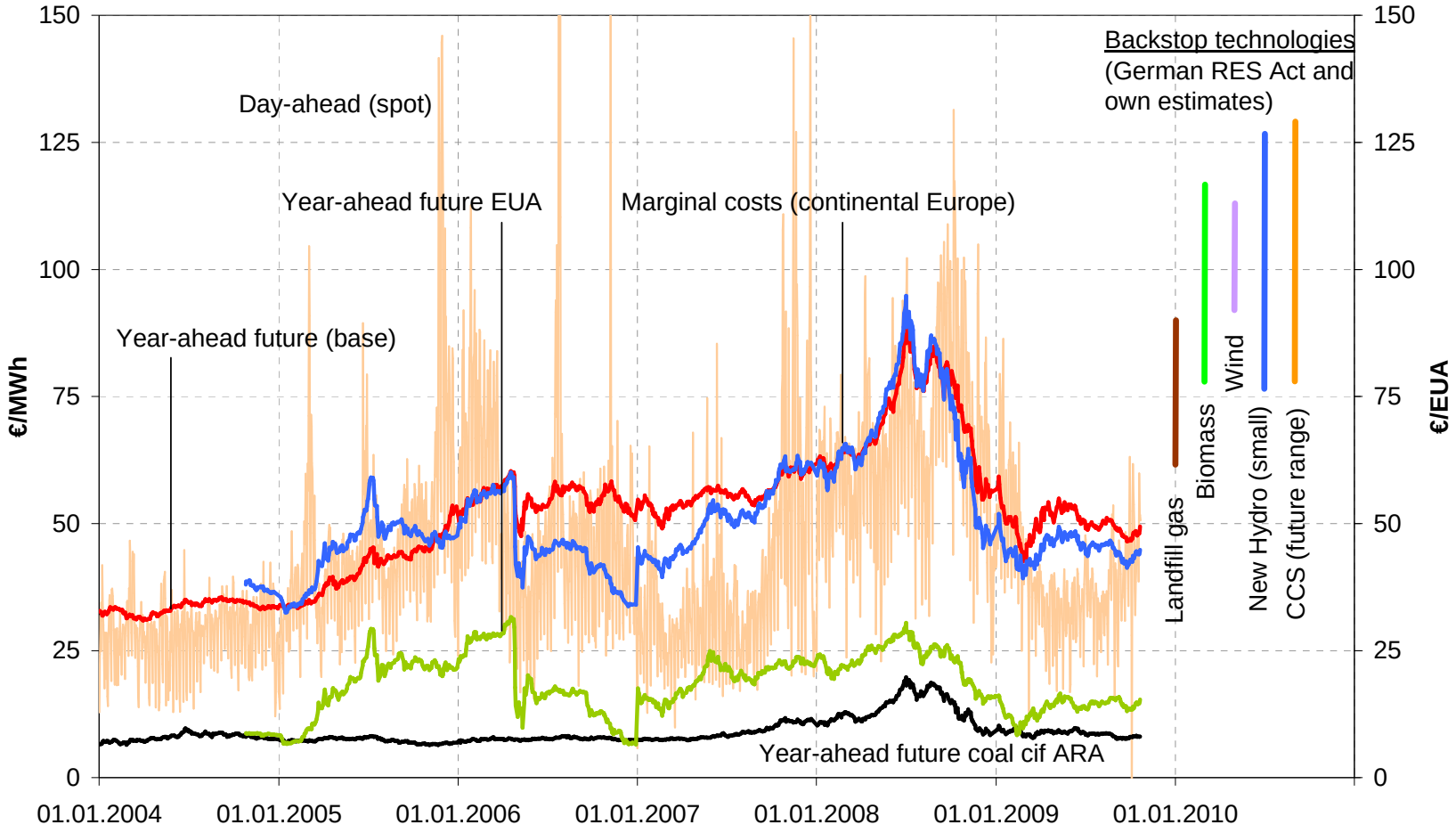

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Planning a CCS infrastructure
Potential infrastructure design

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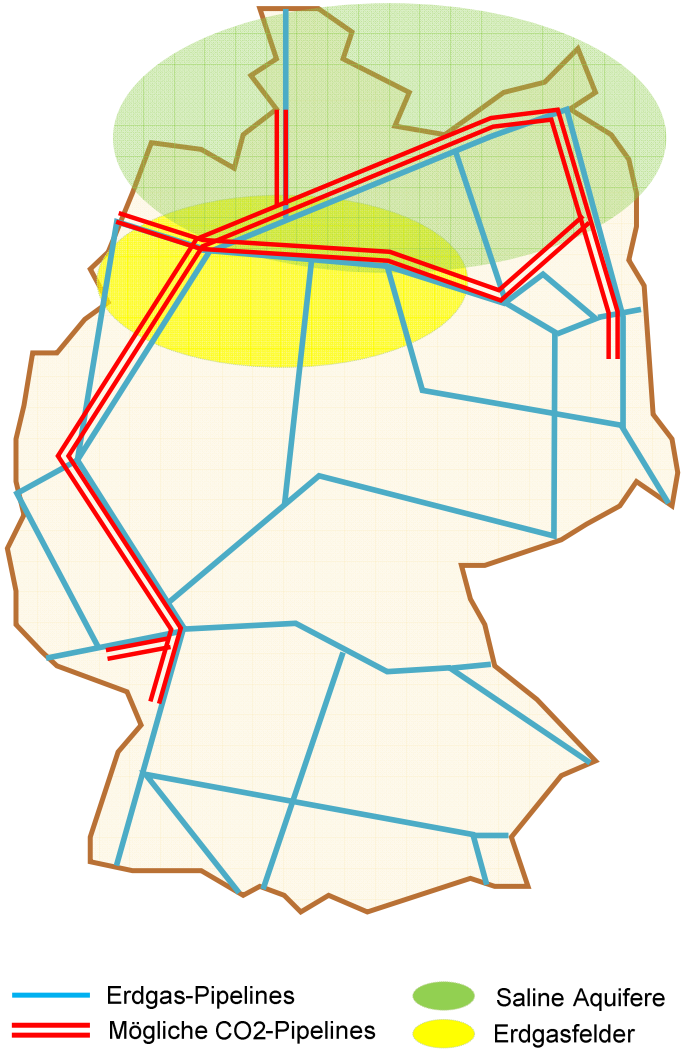

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95% reduction case study on Germany
The role of CCS

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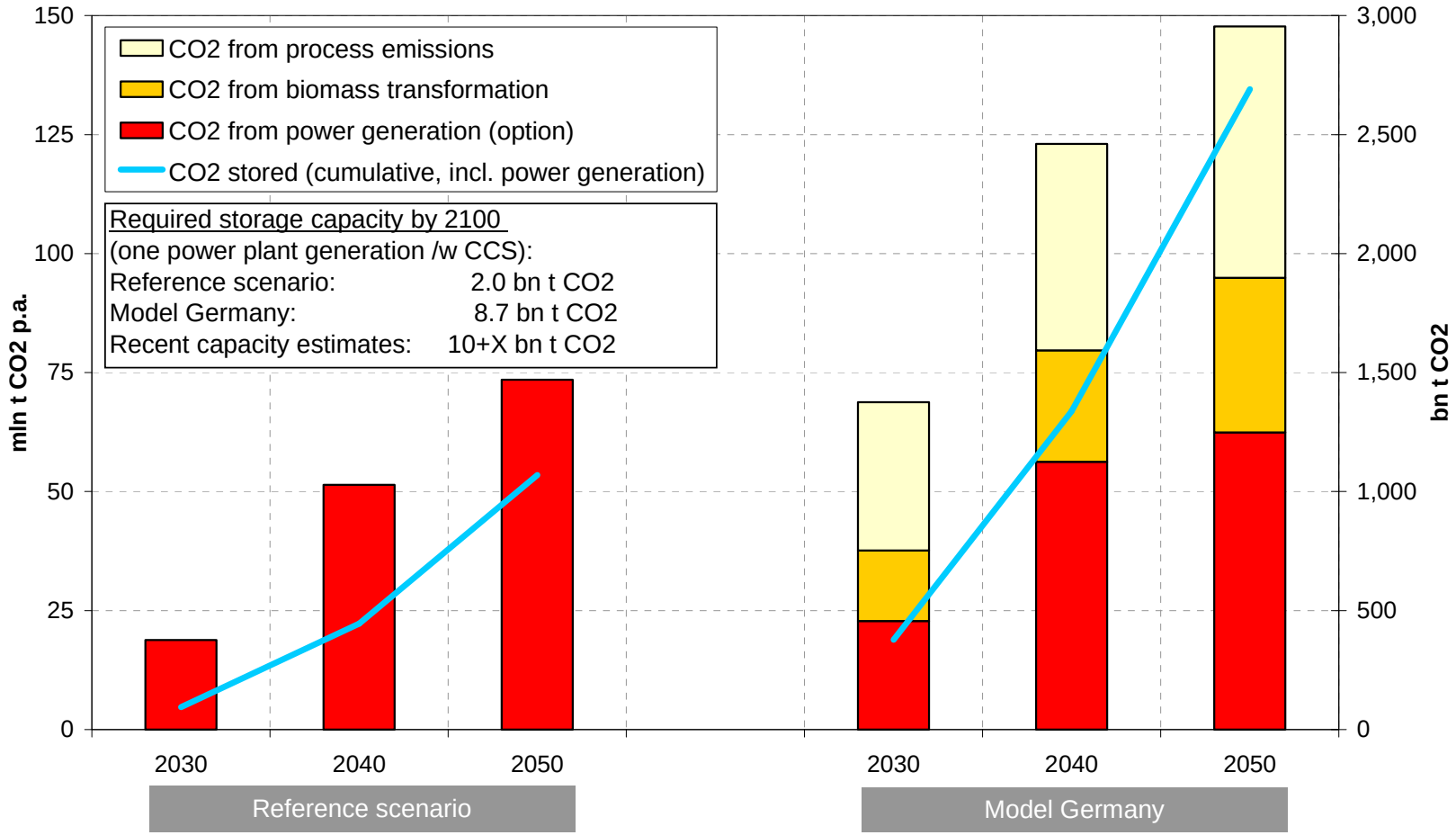

Total GHG -980 mln t CO2e (from 2005)

Prognos/Öko-Institut for WWF 2009

CCS – CO_2 Capture and Storage
Different challenges to the CCS chain

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- **CO2 capture**
  - Technologies (process innovations vs. pure end-of-pipe)
  - Costs (investment & operation)
  - Commercial plant operation requirements
  - Retrofit vs. new-built
- **CO2 transport**
  - Public acceptance
  - Costs (depending on distances)
  - Transport corridors
  - Roll-out of infrastructure and regulation under uncertainty
- **CO2 storage**
  - Public acceptance
  - In-depth knowledge on storage sites, long-term modeling
  - Regulation under uncertainty

CCS – CO_2 Capture and Storage
The role of subsidies

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- **Carbon capture**
  - Power generation: high costs, high innovation potential
  - Process emissions: high uncertainties
  - Biofuel production: low costs (but no incentives)
- **Transport and storage**
  - Lower cost
  - Large-scale synergy potentials
  - … but high risk premiums
- **The case for subsidies**
  - Short- and medium-term: driver for innovation with regard to capture (recent EU approach: NER, recovery program, etc)
  - Medium- and long-term: enabling and cost-efficient infrastructure (immediate action needed)

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Thank you very much

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