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Energy Roadmap 2050: Introduction and overview

Berlin Seminar on Energy and Climate Policy (BSEC)
“Energy Roadmap 2050: New Horizons or Dead End?”

Hannah Förster
Felix Chr. Matthes
Berlin, 9 February 2012

2050 Roadmaps in EU Policy
New horizons for policy making

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- **2011 was the year of the 2050 roadmaps for the EU**
  - Low carbon Economy (March 2011)
  - Transport (March 2011)
  - Energy (March 2011)
- **The Roadmap documents are pre-legislative documents**
  - Commission Communications or With Papers intend to structure debates on future legislation
  - Special characteristics of the 2011 roadmaps
    - long-term horizon
    - extensive modeling exercises (which will play a role when it comes to future legislative proposals – is the Impact Assessment more important than the Communication?!))
    - highlight on EU-wide action (which will create frictions with the current competences of the EU)

Roadmap 2050 modeling exercises
Approaches and scenario design

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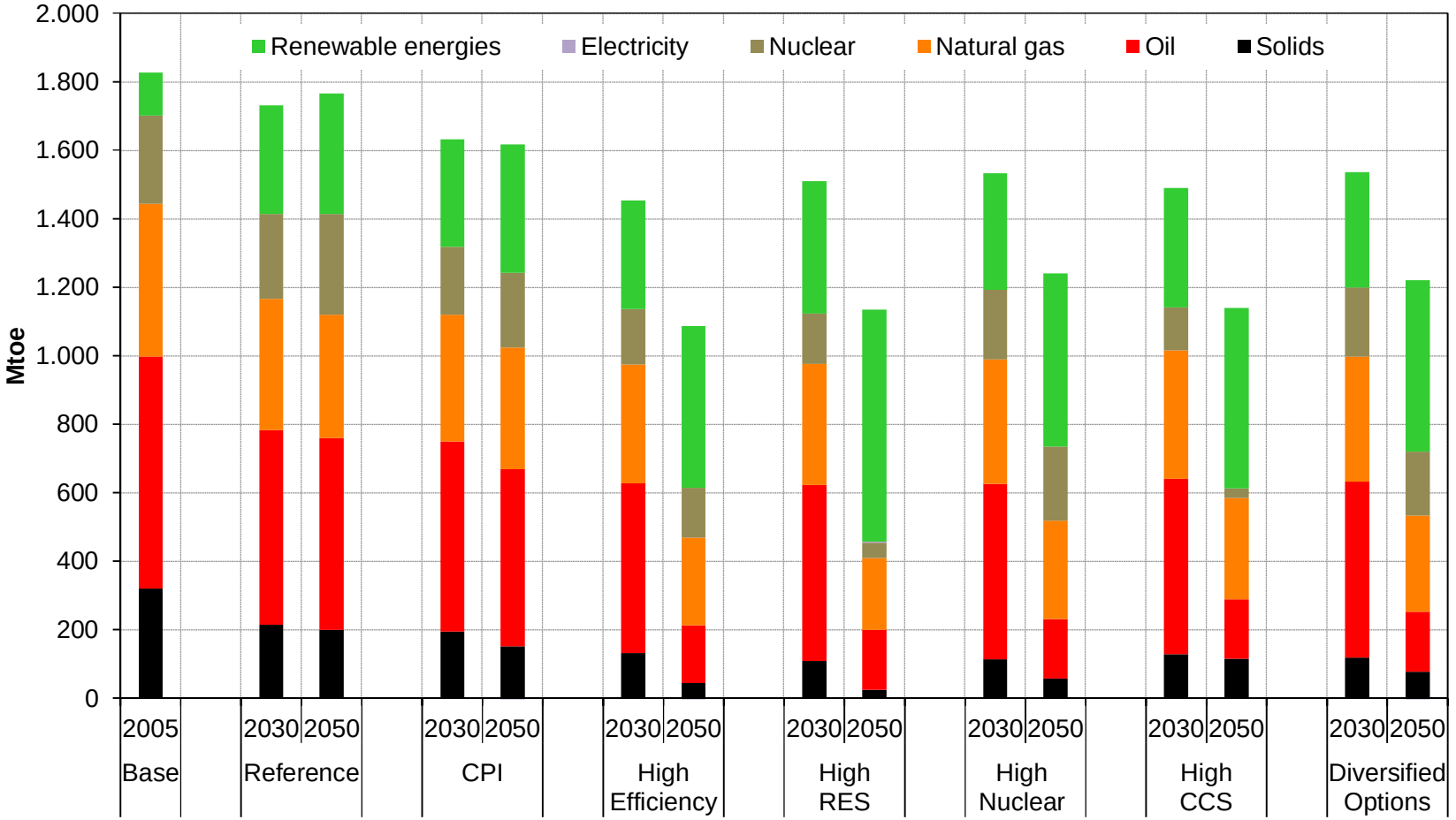
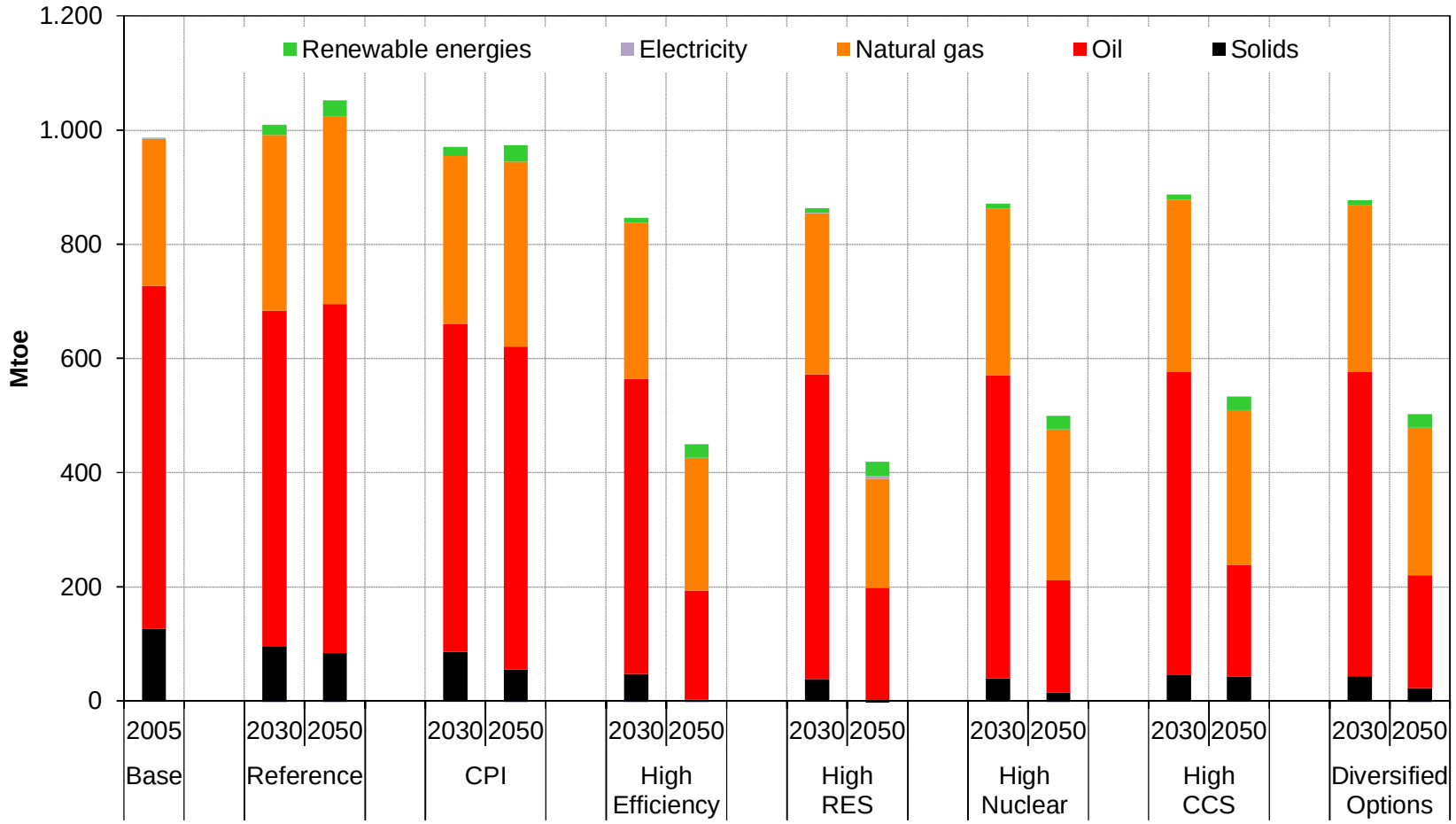
- **PRIMES modeling**
  - another exercise with an disputable modeling monopoly?
  - what are the alternatives for modeling exercises with high sectoral and country-by-country resolution
- **Scenario design**
  - 2 reference scenarios
    - Reference Scenarios (policies in place)
    - Current Policy Initiatives (reflecting also recent legislative projects on energy efficiency and energy taxation)
  - 5 Decarbonisation scenarios (-85% by 2050)
    - High Efficiency
    - High Renewable Energy Sources
    - Delayed CCS (=high nuclear)
    - Low nuclear (=high CCS)
    - Diversified Supply Technologies

Primary energy: Comparable levels & (slightly) different structures



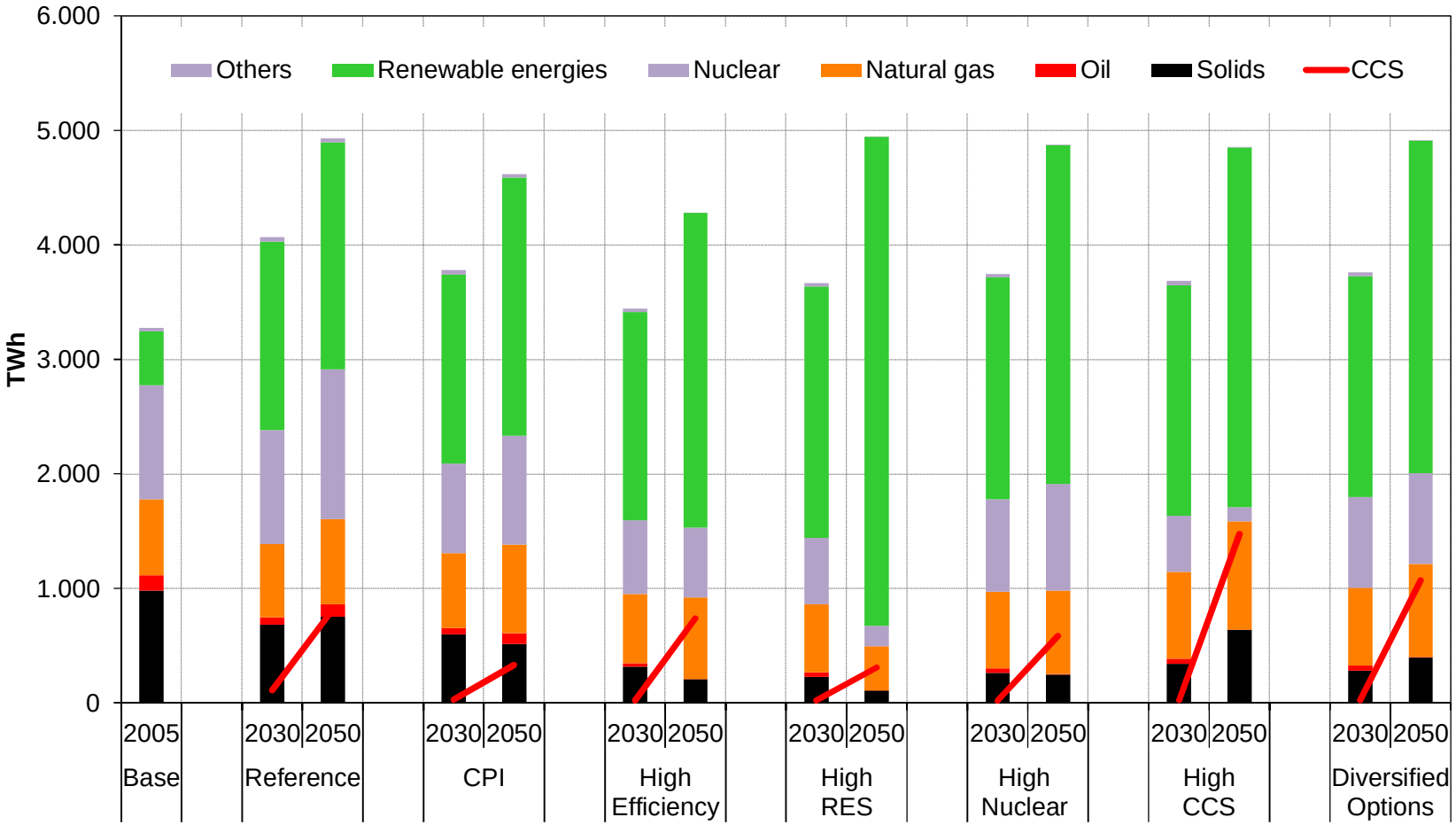
European Commission, E3MLab 2011

(Net) primary energy imports
No more gas import increases?!



European Commission, E3MLab 2011

Power generation: RES dominate - CCS, nuclear & RES compete for 20%?!



European Commission, E3MLab 2011

Power generation from renewables
Transformation to a wind/solar-driven system

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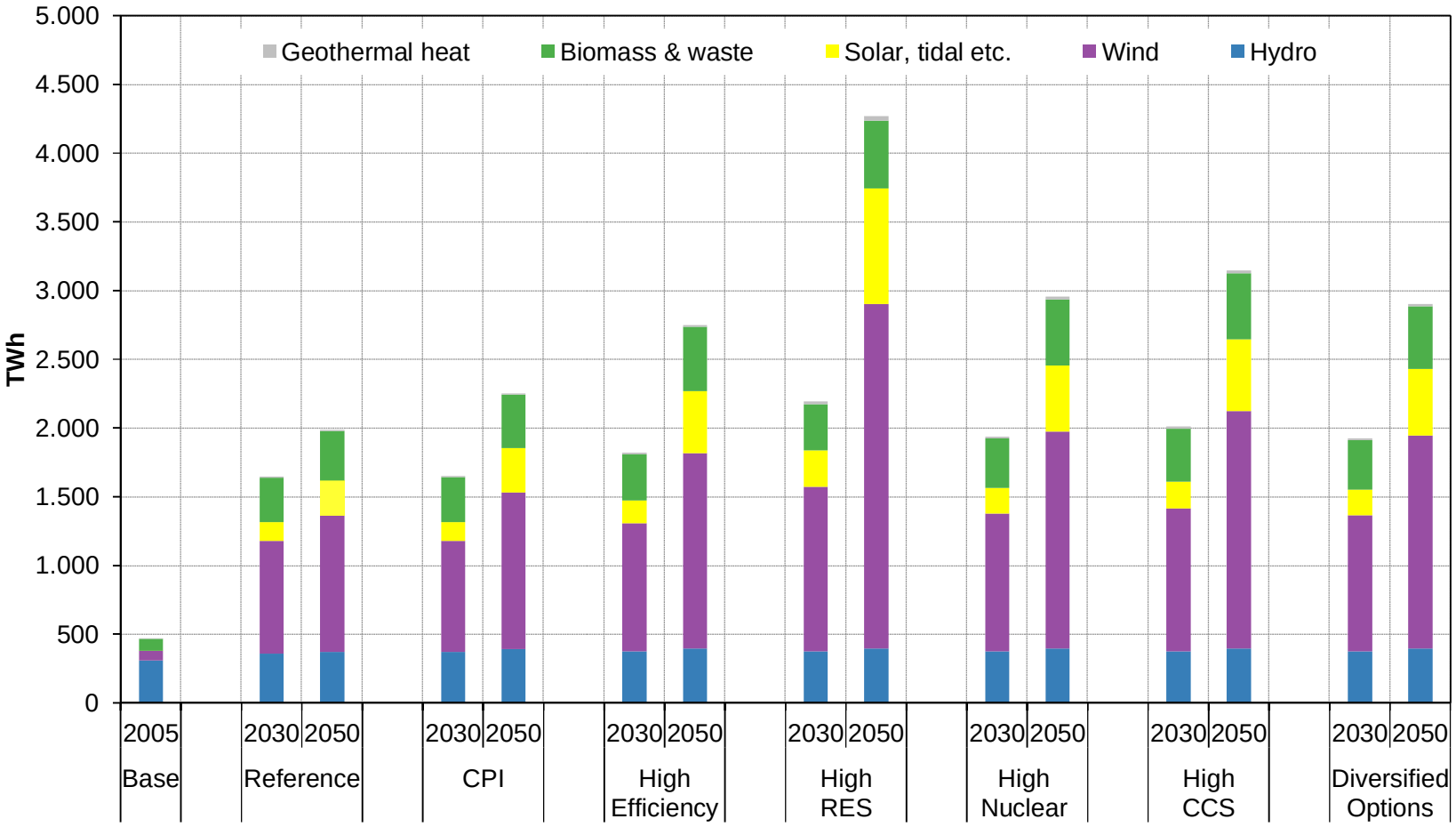

European Commission, E3MLab 2011

EU Energy Roadmap 2050 modeling
(Some) key findings

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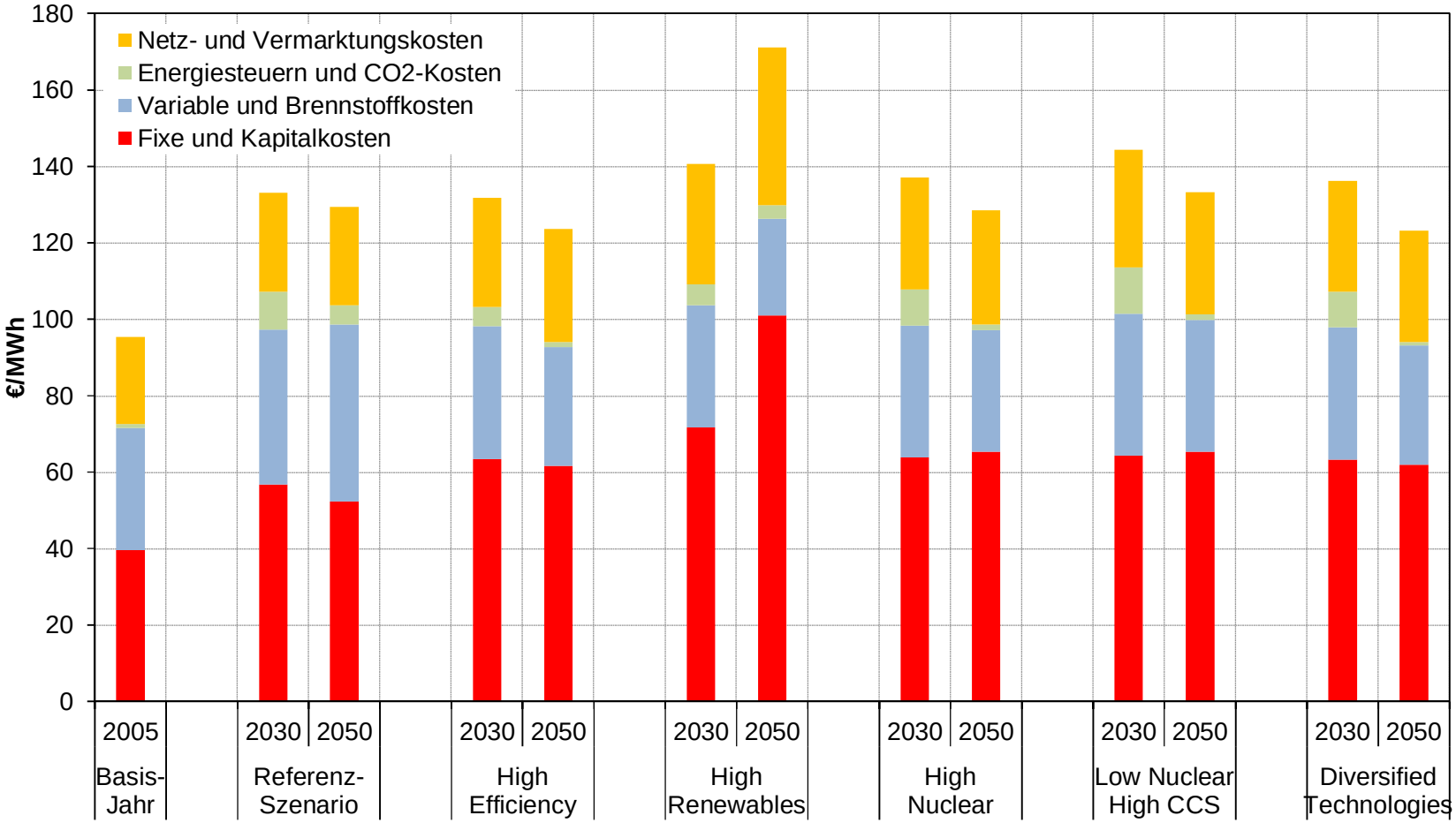
- **Decarbonisation is (technically/structurally) feasible**
- **Is decarbonisation affordable?**
  - differences between (reference and decarbonisation) scenarios for total system costs are significantly lower than modeling uncertainties (14,1 … 14,6 % of GDP)
  - more significant differences for power system costs (beyond 2030)
  - role of key assumptions
    - fuel price assumptions (major prices drop as a result from decarbonisation policies – in the EU/globally)
    - investment cost assumptions (more optimistic: nuclear, CCS, more pessimistic: renewables)
- **Significant changes in cost structures: increasingly capital intensive**

Power system costs: Increasing role of capital and infrastructure costs



Europäische Kommission, Matthes 2012

EU Energy Roadmap 2050
Structural changes (to be discussed)

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- **Commission statements**
  - Decarbonisation is possible – and can be less costly than current policies in the long-run
  - Higher capital expenditures and lower fuel costs
  - Electricity plays an increasing role
  - Electricity prices rise until 2030 and then decline
  - Household expenditure will increase
  - Energy savings throughout the system are crucial
  - Renewables rise substantially
  - Carbon capture and storage has to play a pivotal role in system transformation
  - Nuclear provides an important contribution
  - Decentralised systems increasingly interact
- **A 'pleasing everybody' approach?**

EU Energy Roadmap 2050
Challenges (and opportunities)

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- **Commission statements**
  - Technology routes
    - Energy saving and managing demand: a responsibility for all
    - Switching to renewable energy sources
    - Gas plays a key role in the transition
    - Transforming other fossil fuels
    - Nuclear energy as an important contributor
    - Smart technology, storage and alternative fuels
  - Energy markets
    - New ways to manage electricity
    - Integrating local resources and centralised systems
  - Mobilising investors – a unified and effective approach to energy sector incentives
  - Engaging the public is crucial
- **The agenda for EU policy makers in the years to come?!**

Questions for the debate

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- **Is the roadmap exercise a useful approach for energy and climate policy making?**
  - internally (Member States & EU institutions)
  - externally (the external energy partners/suppliers)
- **What are the key shortfalls**
  - in the roadmap
  - in the analysis
- **What challenges and opportunities arise from the debate on the roadmap**
- **What can we do to fill gaps and improve the emerging debate?**

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Thank you very much

Hannah Förster &
Felix Chr. Matthes
Energy & Climate Division
Büro Berlin
Schicklerstraße 5-7
D-10179 Berlin
h.foerster@oeko.de
f.matthes@oeko.de
www.oeko.de