



EU decarbonisation pathways -modelling and policy

IEA 17 October 2016



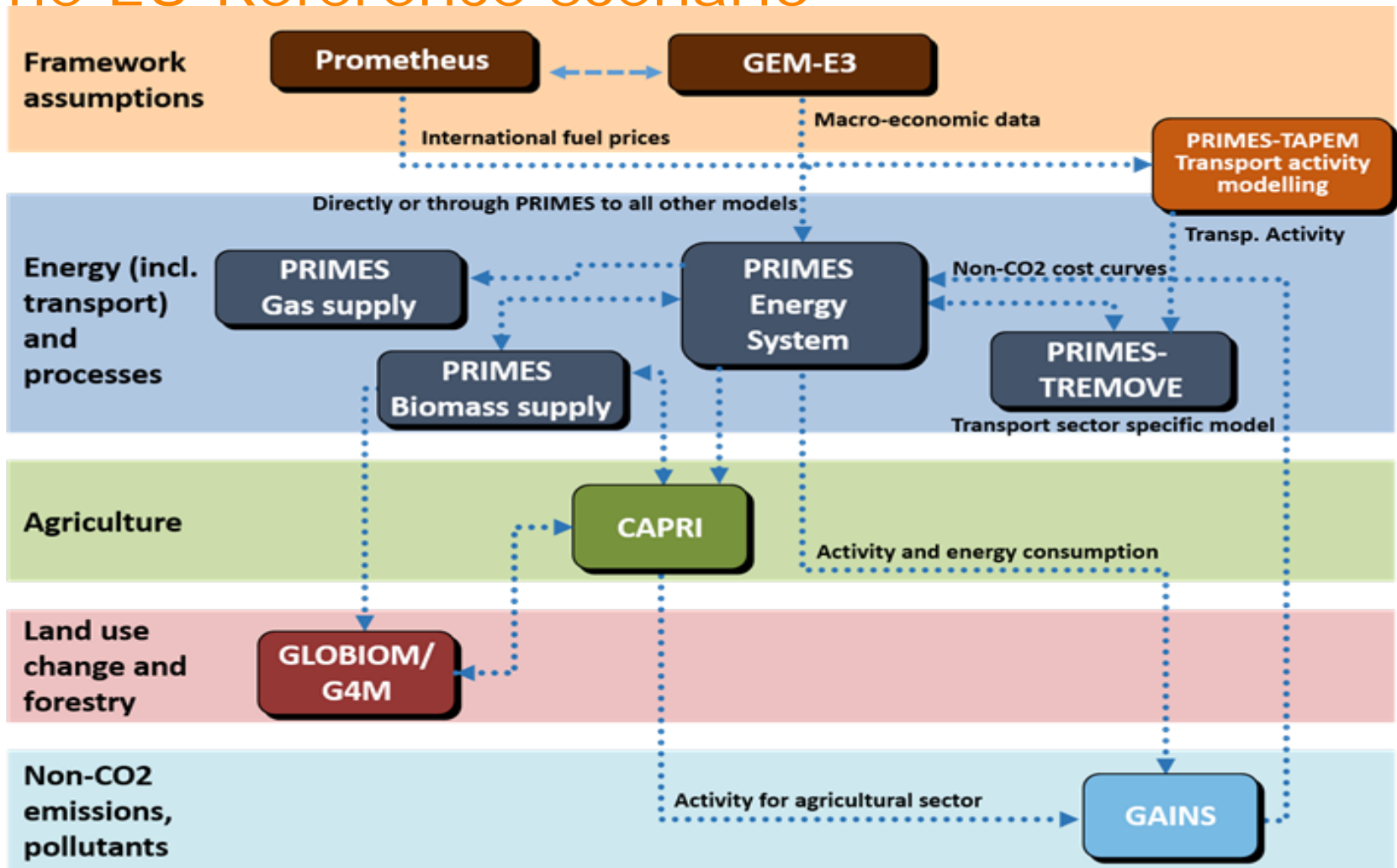
EU Energy and climate policy: the Energy Union

5 dimensions to the Energy Union

- ❑ Security of supply – stocks, supply concentration– legislation
- ❑ Internal market – price convergence – legislation
- ❑ Energy efficiency 20% 27% - legislation
- ❑ Decarbonisation 20% 40% (27%)– ETS & “Effort Sharing”, renewable energy – legislation
- ❑ Competitiveness & Innovation - Energy Union Report, price and costs report

All Commission proposals require “impact assessments”, evidence and analysis

The EU Reference scenario

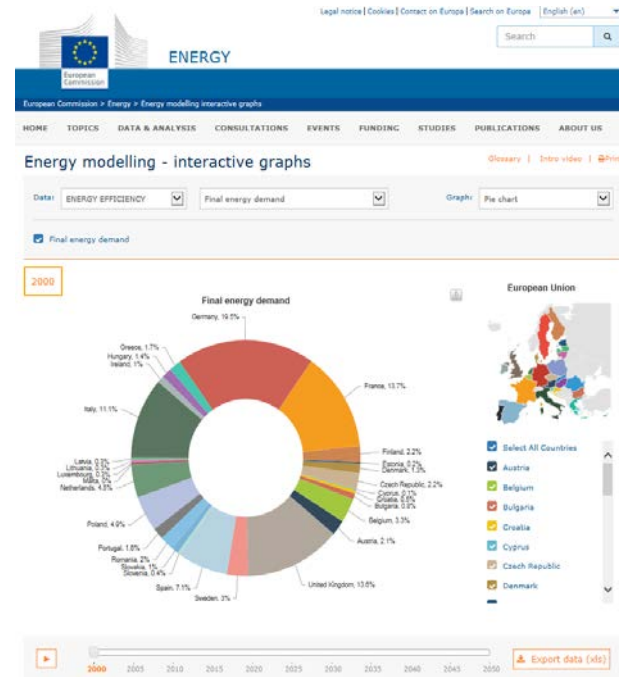


Webpage: <https://ec.europa.eu/energy/en/data-analysis/energy-modelling>

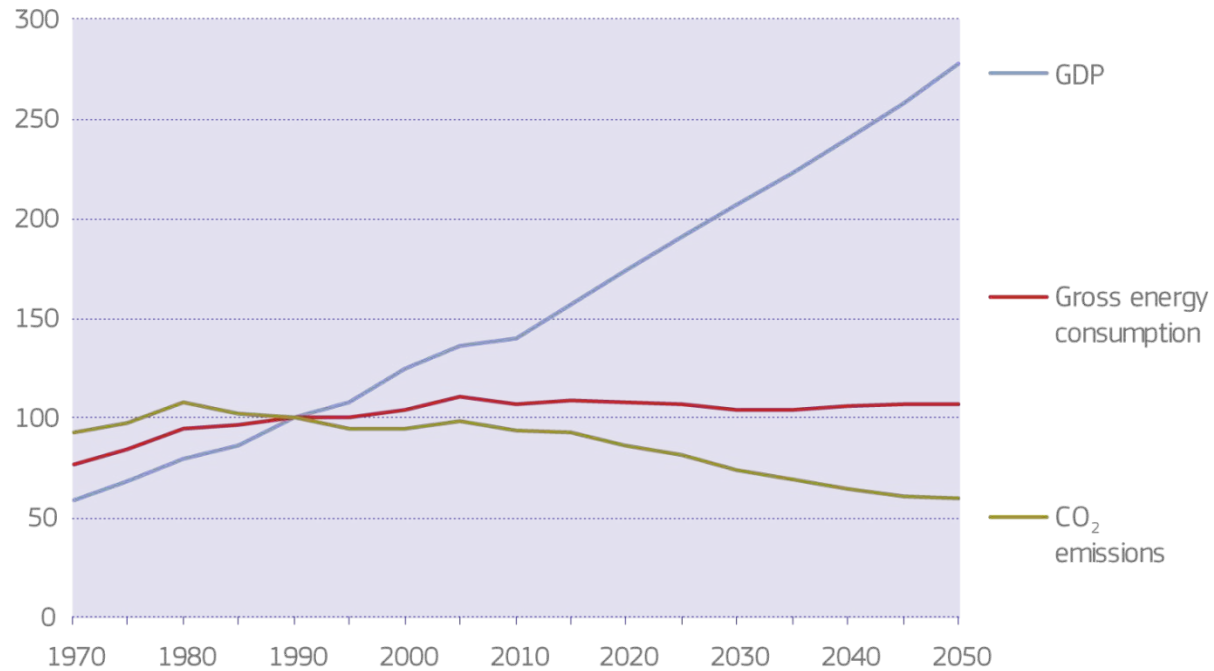
EU Reference Scenario 2016 Publication



An interactive tool helps explore the results in a user-friendly way



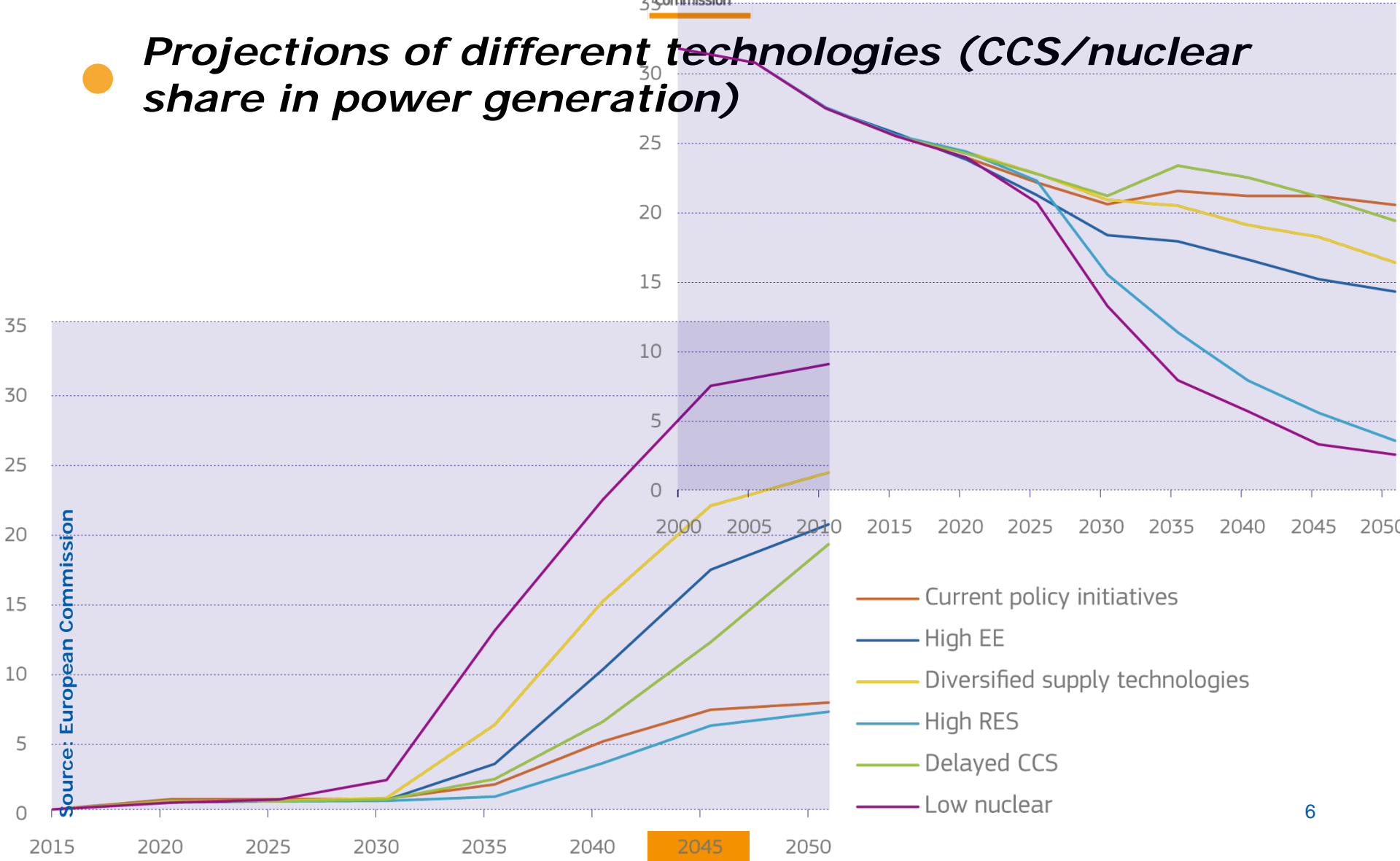
2050 pathways reference scenario: GDP, energy consumption and CO₂ emissions





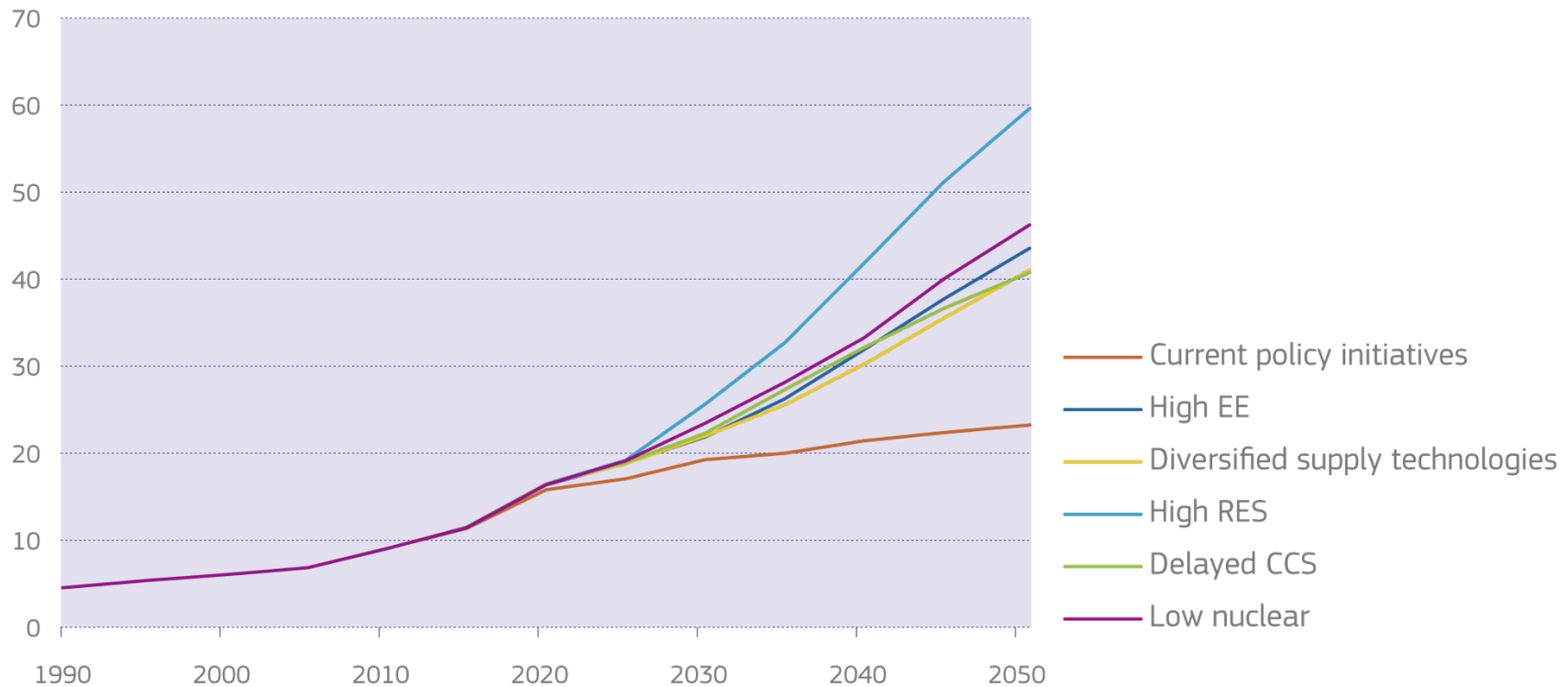
European Commission

Projections of different technologies (CCS/nuclear share in power generation)



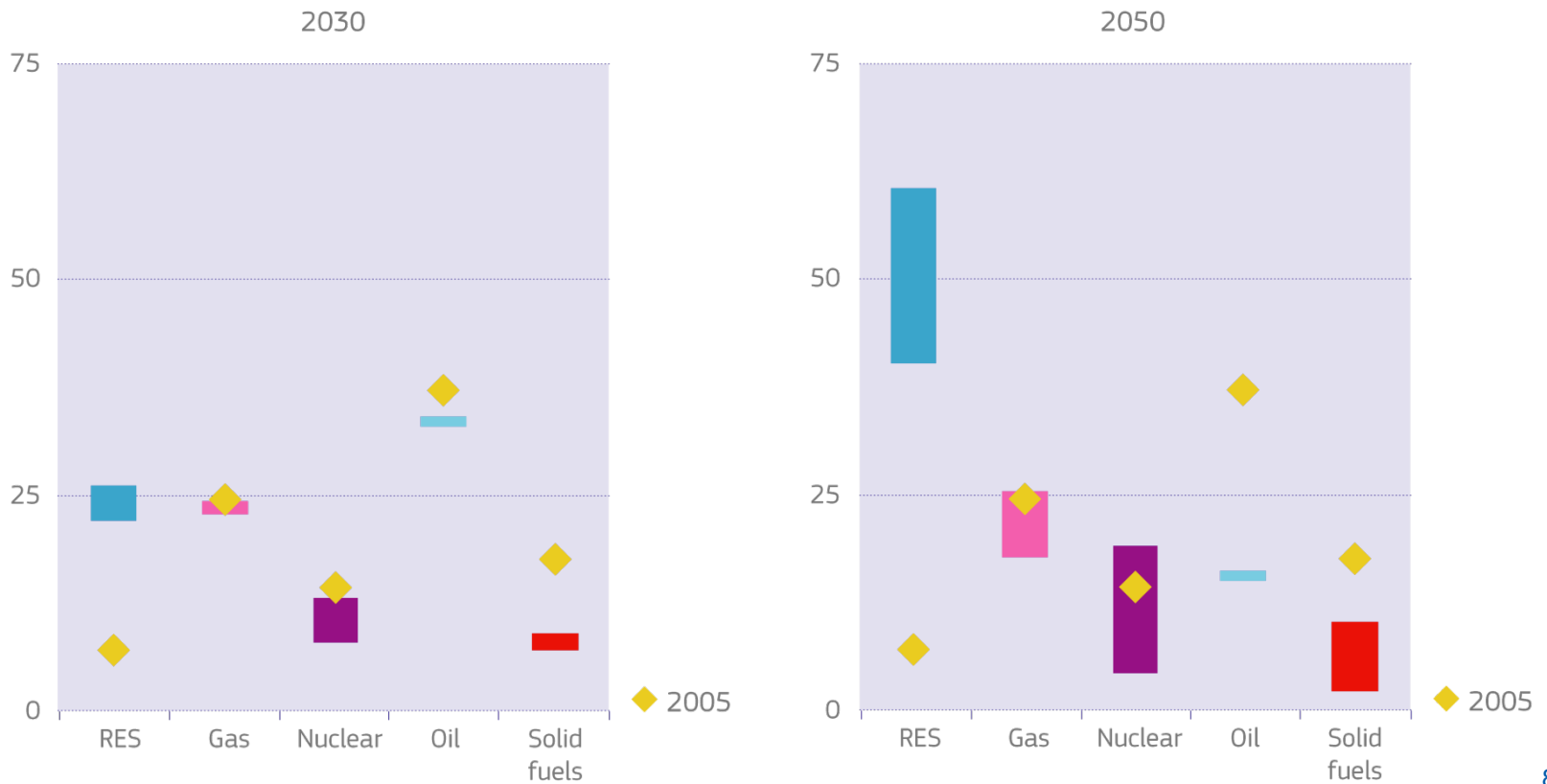
Source: European Commission

● **6 policy scenarios**
(Share of renewables in gross final energy consumption)

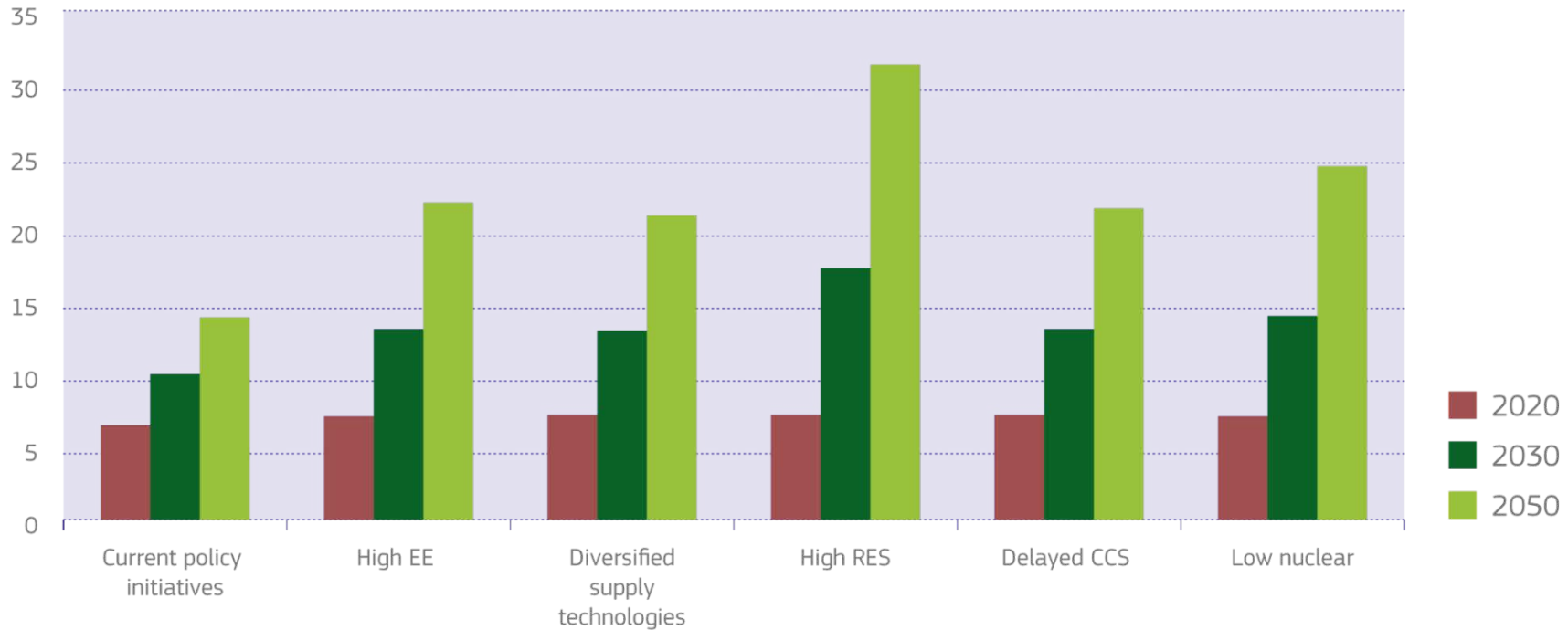


The share of RES achieves at least 55% in gross final energy consumption in 2050, up 45 percentage points from today's level at around 10%.

● **Range of projections for primary energy consumption (%)**



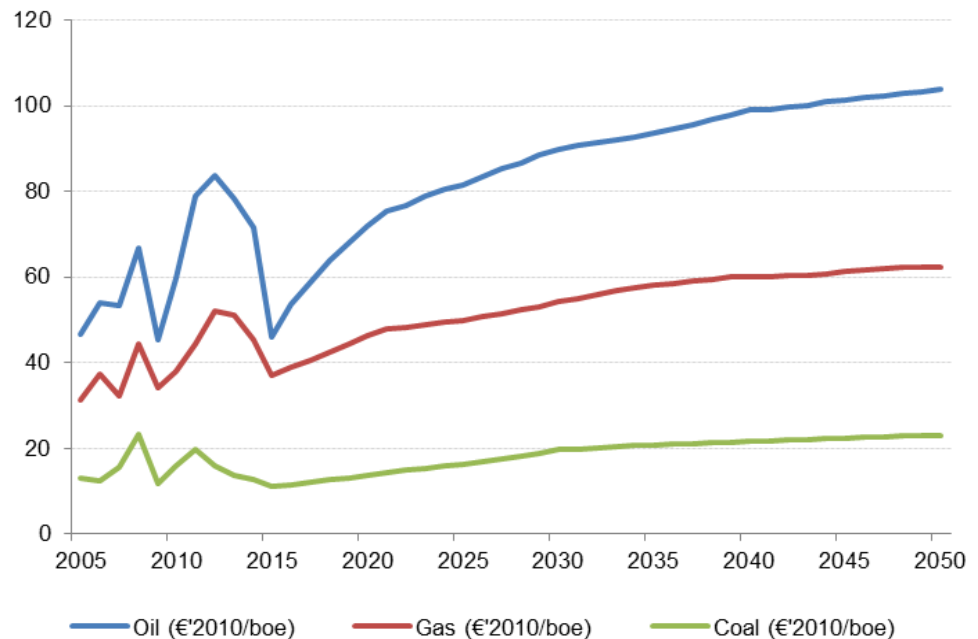
● ***Outputs with grid and market implications
(share of decentralised power generation)***



2016 reference scenario

Fossil fuel prices and other inputs

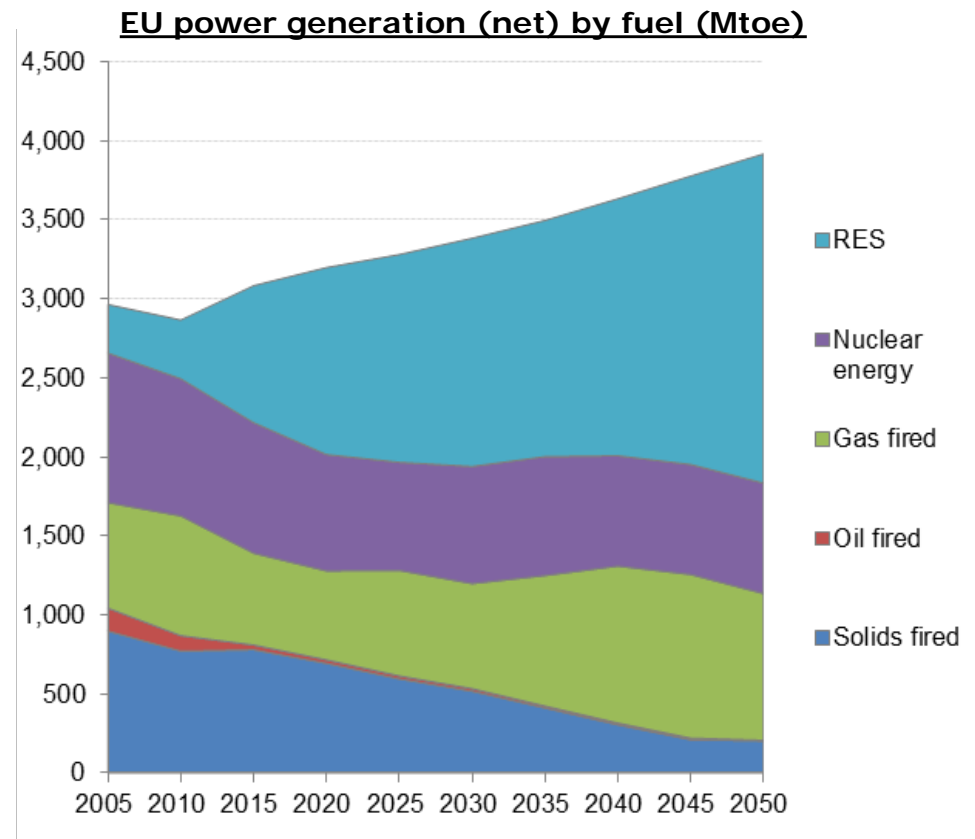
- Current oversupply leads to lower hydrocarbon prices than recent past until 2020
- Declining resource to production ratios drive increases in oil and gas prices after 2020
- Deceleration in global demand combined with vast amounts of cheap coal resources mean that coal prices will not exceed recent peaks before 2030



Source: PROMETHEUS modelling, NTUA, E3M-Lab

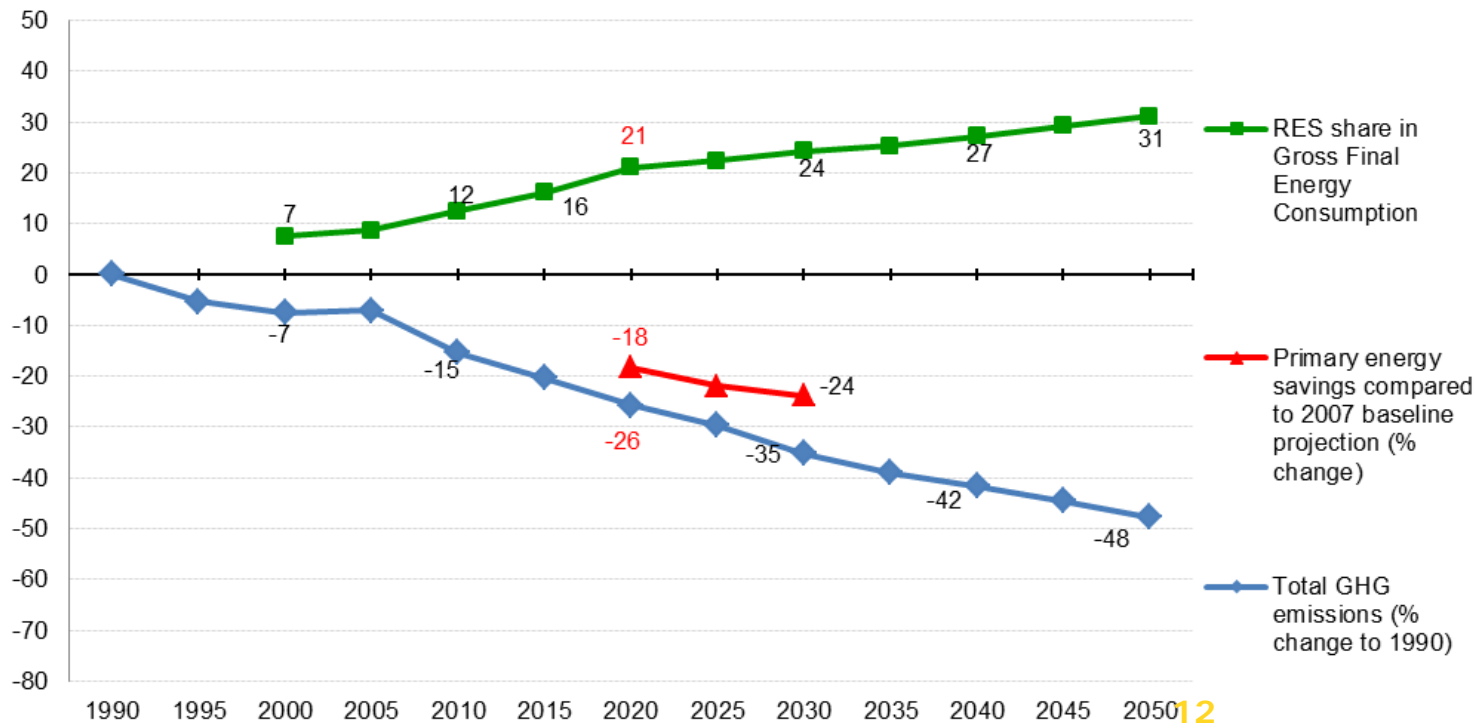
2016 reference scenario: The EU power mix

- Significant development of renewable energy (mostly solar and wind onshore)
- Biomass remains stable over the period
- Decline of electricity generation from solid fuels (mostly coal)
- Gas-fired generation decreases until 2020, but increases thereafter
- Nuclear energy decreases slightly



EU energy trends show good progress, but more effort is needed to meet medium to long term targets and objectives

Projection of key policy indicators: GHG emissions, renewables share and energy efficiency





Projected decrease in EU fossil fuel production, but **import dependency** increases only slowly increase – more renewable energy, energy efficiency. Nuclear energy remains stable.

EU **power generation mix**: renewables growth, nuclear stable, gas maintains its role, other fossil fuels decrease.

Significant **energy efficiency** improvements. Primary energy demand and GDP will continue to decouple.

Significant growth in **transport activity**, but ongoing decoupling between energy consumption and activity

Greenhouse gas emissions decrease beyond 20% in 2020; further decreases thereafter but below agreed 2030 and 2050 objectives.

Energy-related investment increases substantially until 2020 (capital costs, rising fossil fuel prices), then stabilising/falling.



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Commission proposals and analysis presented to Member States and then texts negotiated.