

EU – long term energy scenarios

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Directorate-General
for Energy
and Transport



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● Trend and policy scenarios for EU

- Presentation on Trend scenario (baseline update 2007)
- Three alternative scenarios:
 - » EU – climate and RES package of January 2008: 20% GHG reduction based also on JI/CDM;
 - » 20% GHG reduction with action only in the EU;
 - » very high world oil prices: 119 \$(05) /barrel in 2030
- Focus on important variables for EU – OPEC relations, such as:
 - » net imports of oil and gas
 - » CO2 emissions

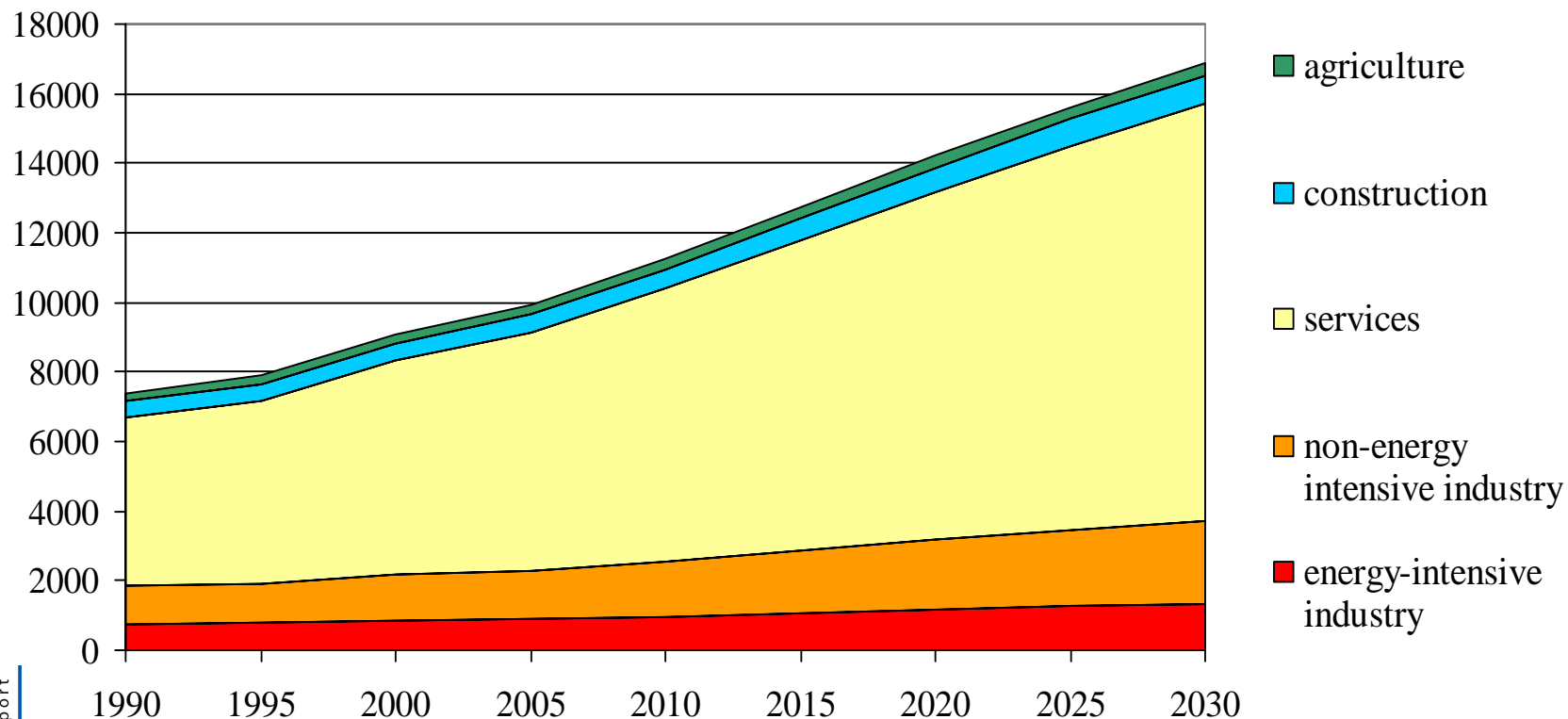
● Process of Energy Modelling

- Scenarios established by independent consultants (NTUA) for Commission services. Member States experts involved through group of energy economic analysts
- Scenarios through 2030 modelled for 27 MSs using mainly PRIMES
- Assumptions on macro-economics and energy import prices derived with specialised models (GEM-E3, POLES, PROMETHEUS)
- Baseline report recently published on Europa-website. Policy scenarios will be published

● Nature of the Baseline Scenario

- Baseline is trend projection and reference to compare against alternative scenarios reflecting policy objectives
- The Baseline scenario assumes continuation of current trends and policies:
 - » Market forces are the main drivers. Economy and Technology evolve (e.g. 2.2% pa GDP growth up to 2030, with structural change towards services and low energy intensive industry)
 - » No new policy initiatives after 2006. Ongoing policies on internal market, energy efficiency, RES promotion, and nuclear phase-out as decided in MS
- No assumption on achievement of RES or GHG targets

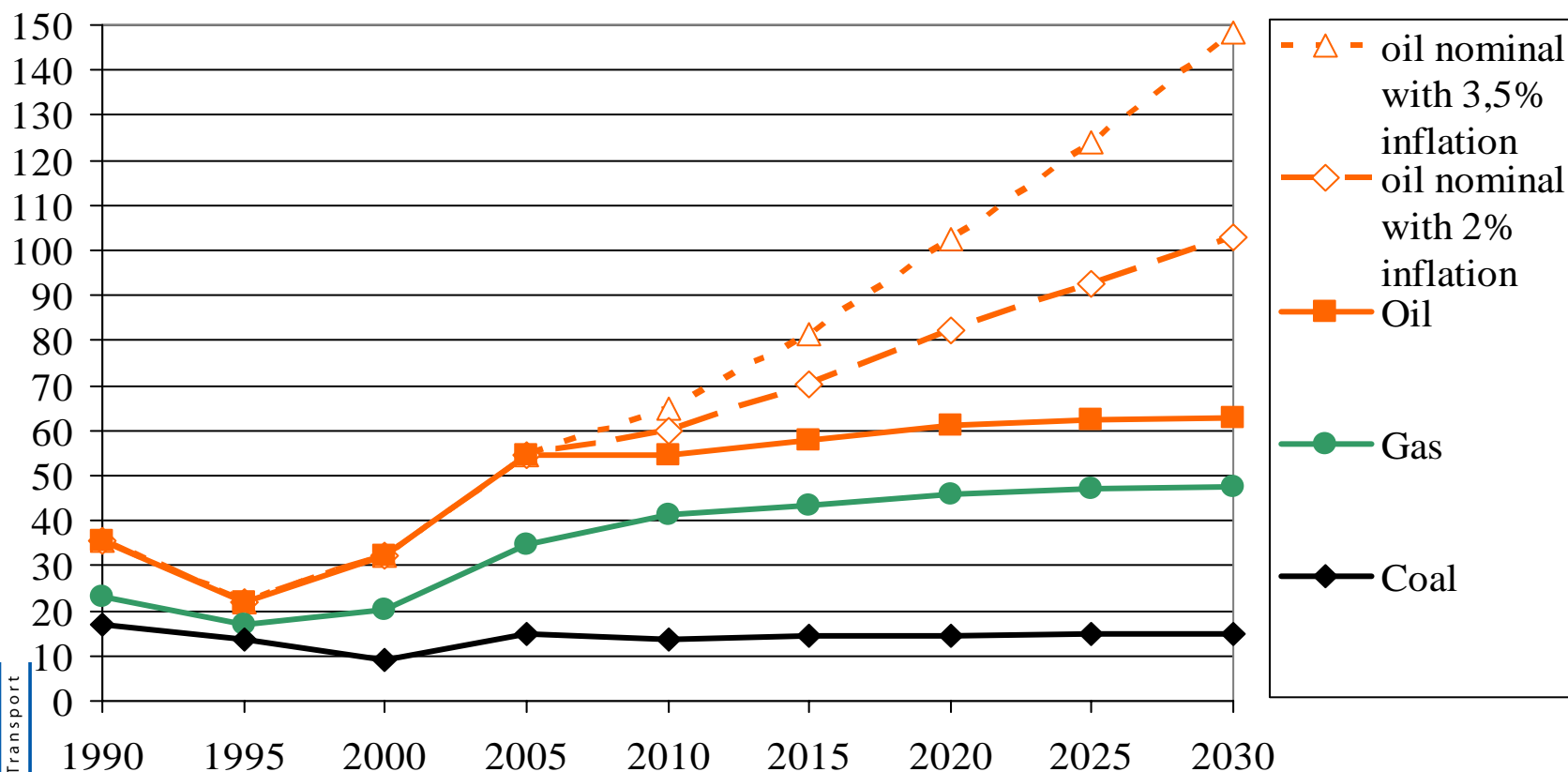
● EU-27: Value added by sector (bill. € of 2005)



- GDP grows by 2.2% pa up to 2030 with almost stagnant population
- Structure changes towards services and low energy/material industries

Energy Import prices and ETS prices

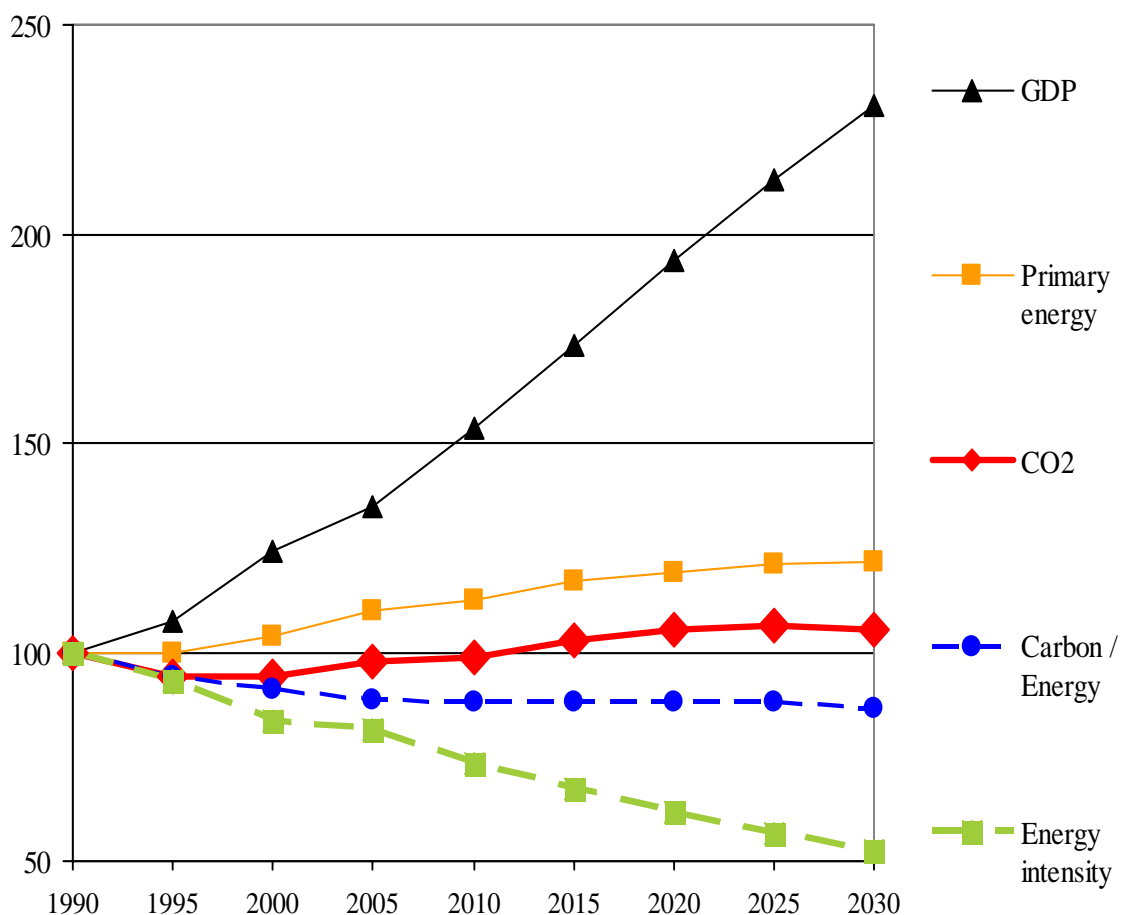
\$/boe (of 2005)



- ETS reflected through CO2 prices of 20 €/t CO2 in 2010, 22 € in 2020 and 24 € in 2030 with mainly grandfathering

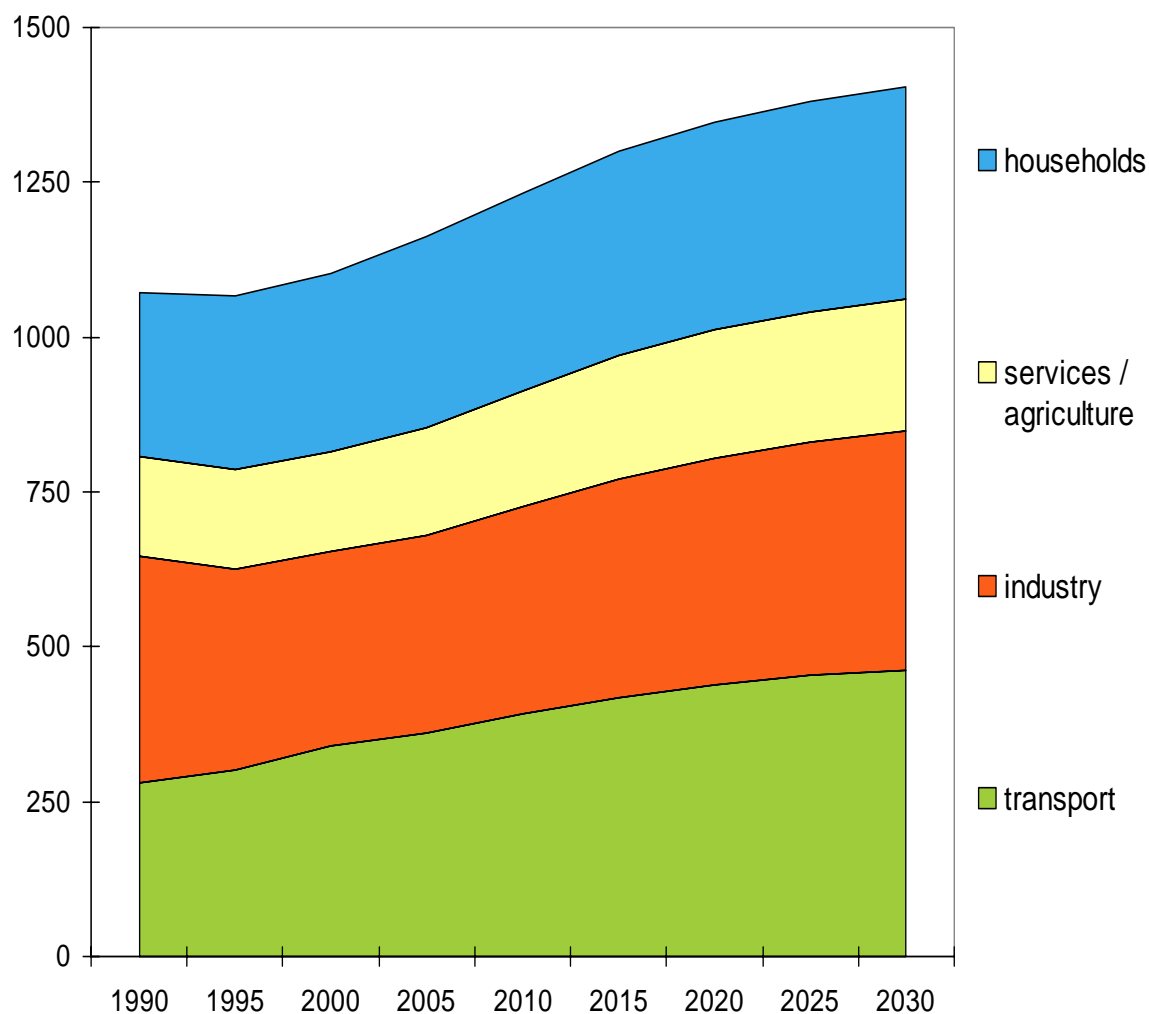
● EU-27: Baseline overview: GDP, energy demand, CO2, energy and carbon intensity (1990 = 100)

- Significant energy intensity improvements through structural change and energy efficiency
- Reversal of CO2 in 1990s mainly due to limited fuel switching to low/zero carbon fuels
- Little substitution in strongly growing transport; insufficient RES penetration and nuclear phase-out bringing secular trend towards lower carbon intensity to a halt



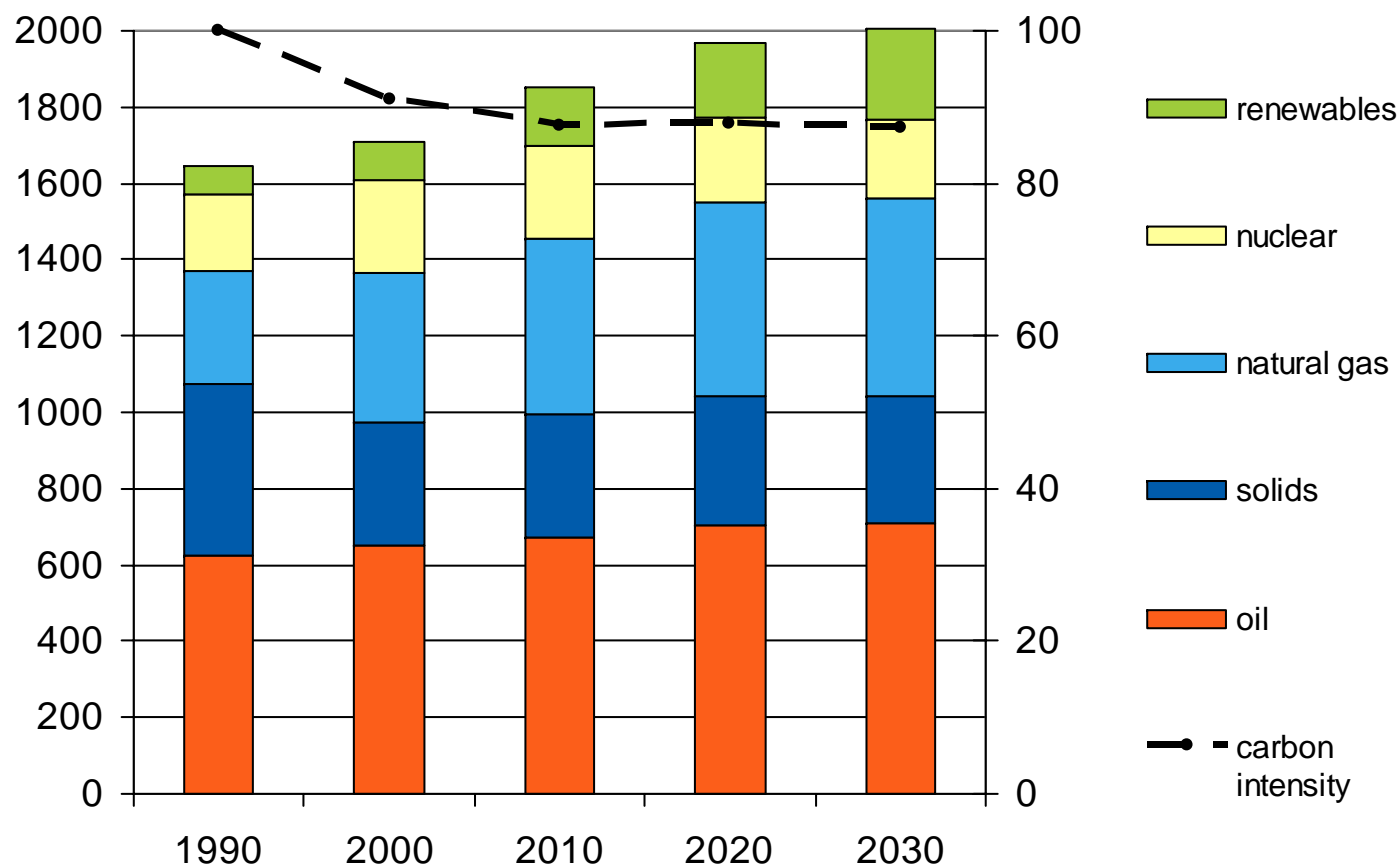
● EU-27: Baseline: Final energy demand by sector (in mtoe)

- Energy demand (+20% in 2005-2030) is driven by rise in transport and services
- Industry and households grow less (despite significant economic growth and increase in the number of households)
- Fuel switching to gas and electricity



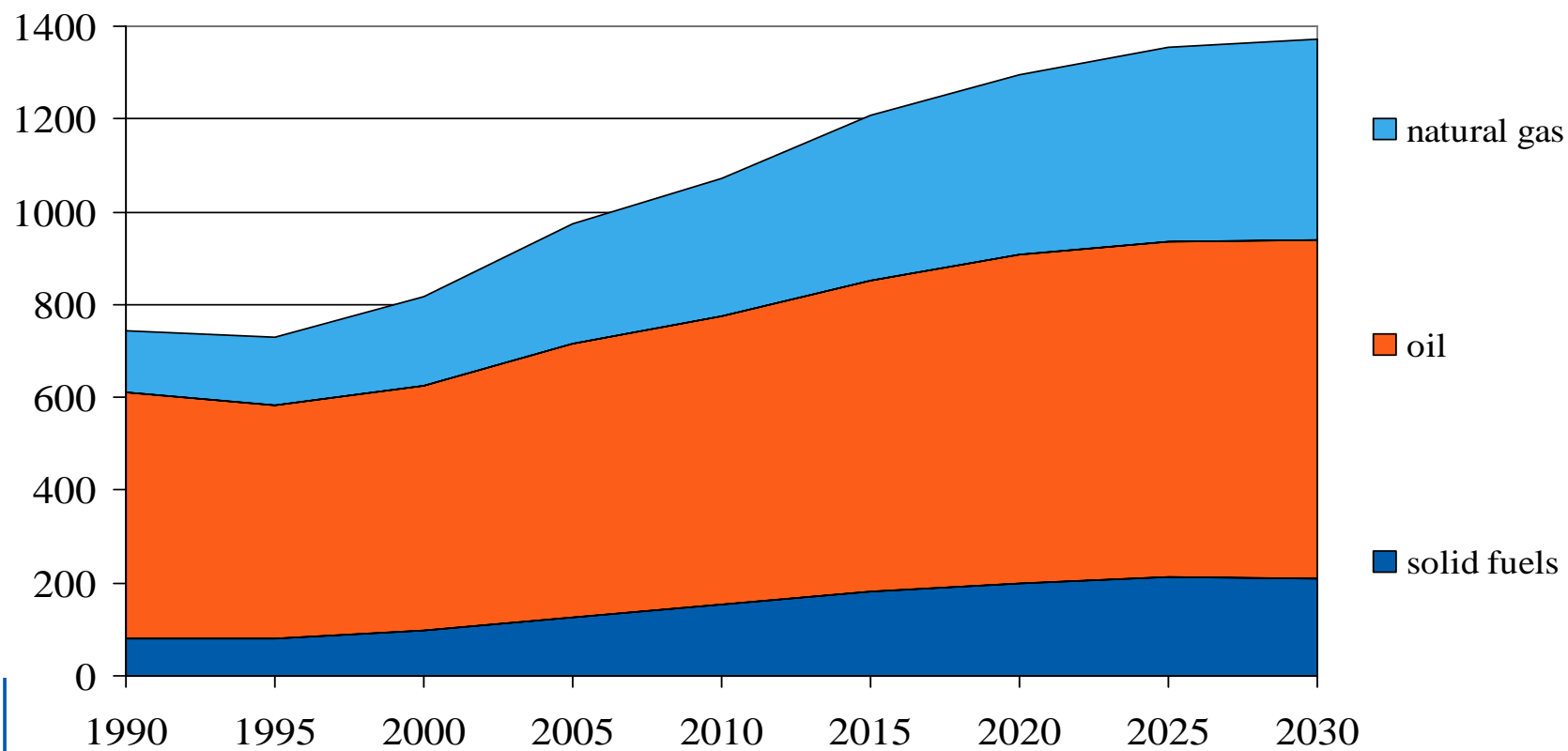


EU-27: Baseline: Gross energy consumption by fuel and carbon intensity



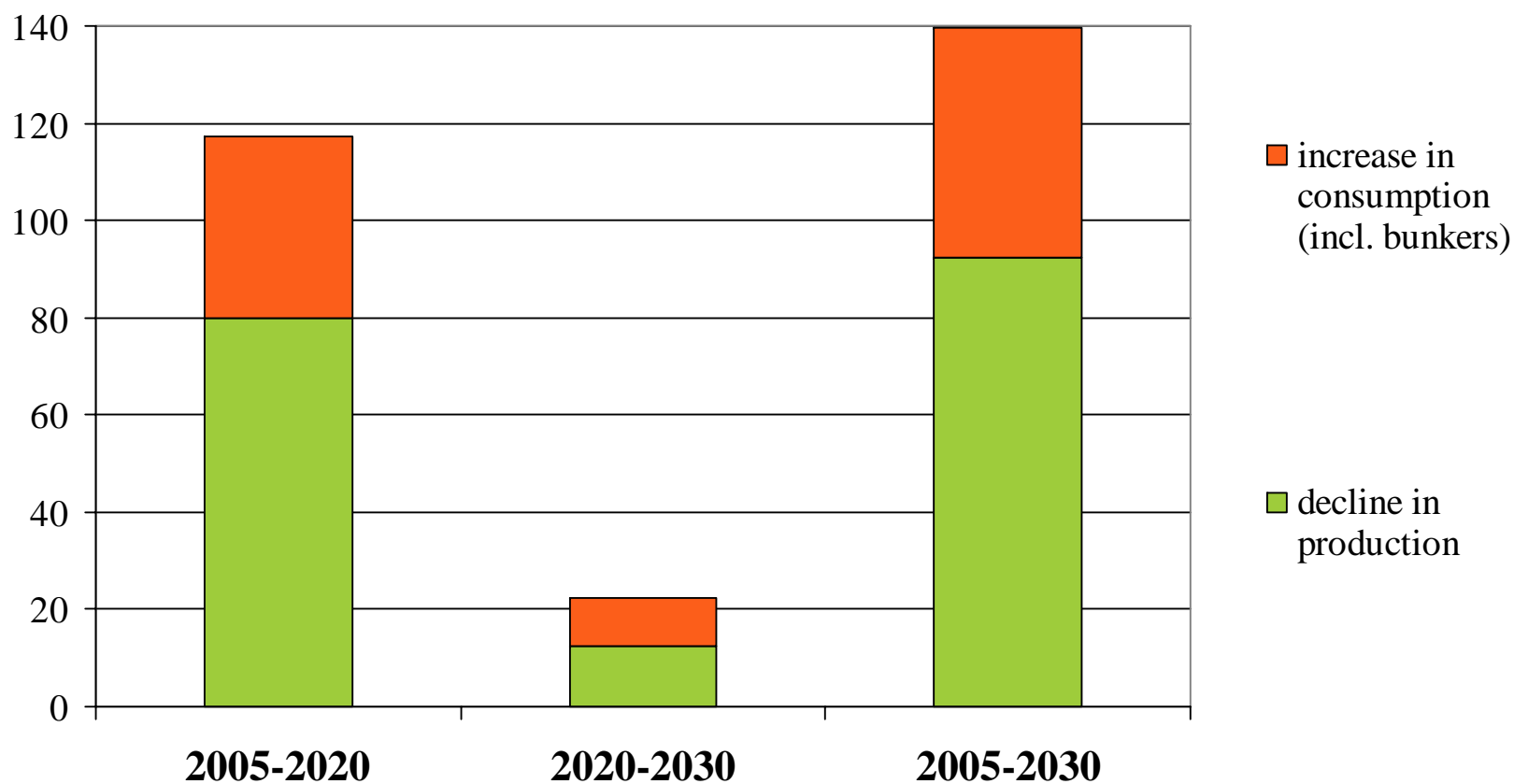
- Oil driven by rising transport and keeping highest share;
- Strongest growth in RES and gas;
- Decline in nuclear with replacement by coal in the long term;
- De-carbonisation comes to a halt.

● EU-27: Net imports of fossil fuels in the baseline (in mtoe)



- **Net imports oil: +20% in 2020 and +24% in 2030 compared to 2005**
- **Net imports gas: +52% in 2020 and +68% in 2030 compared to 2005**

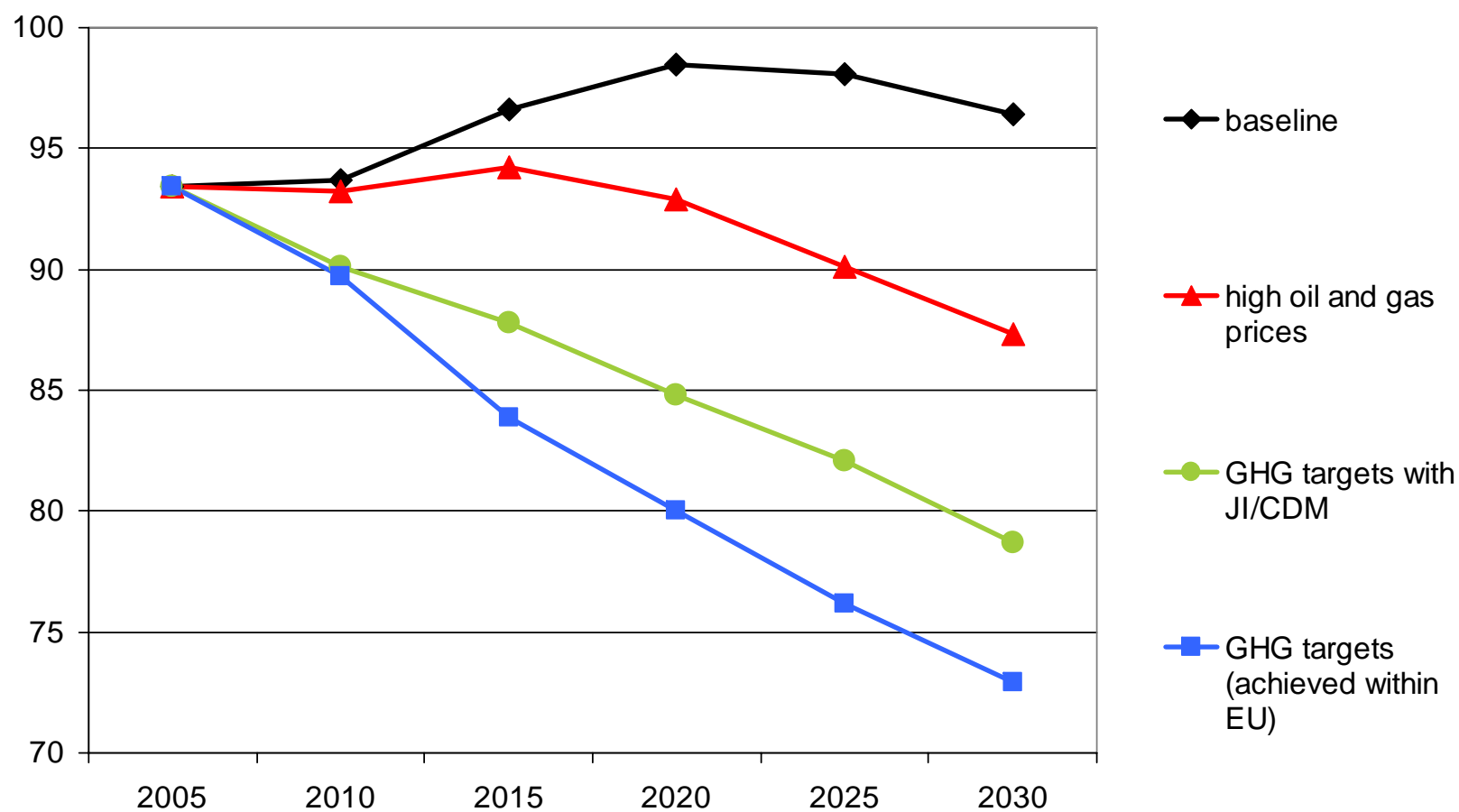
● EU-27: Baseline: additional imports of oil:
breakdown into components (in Mtoe)



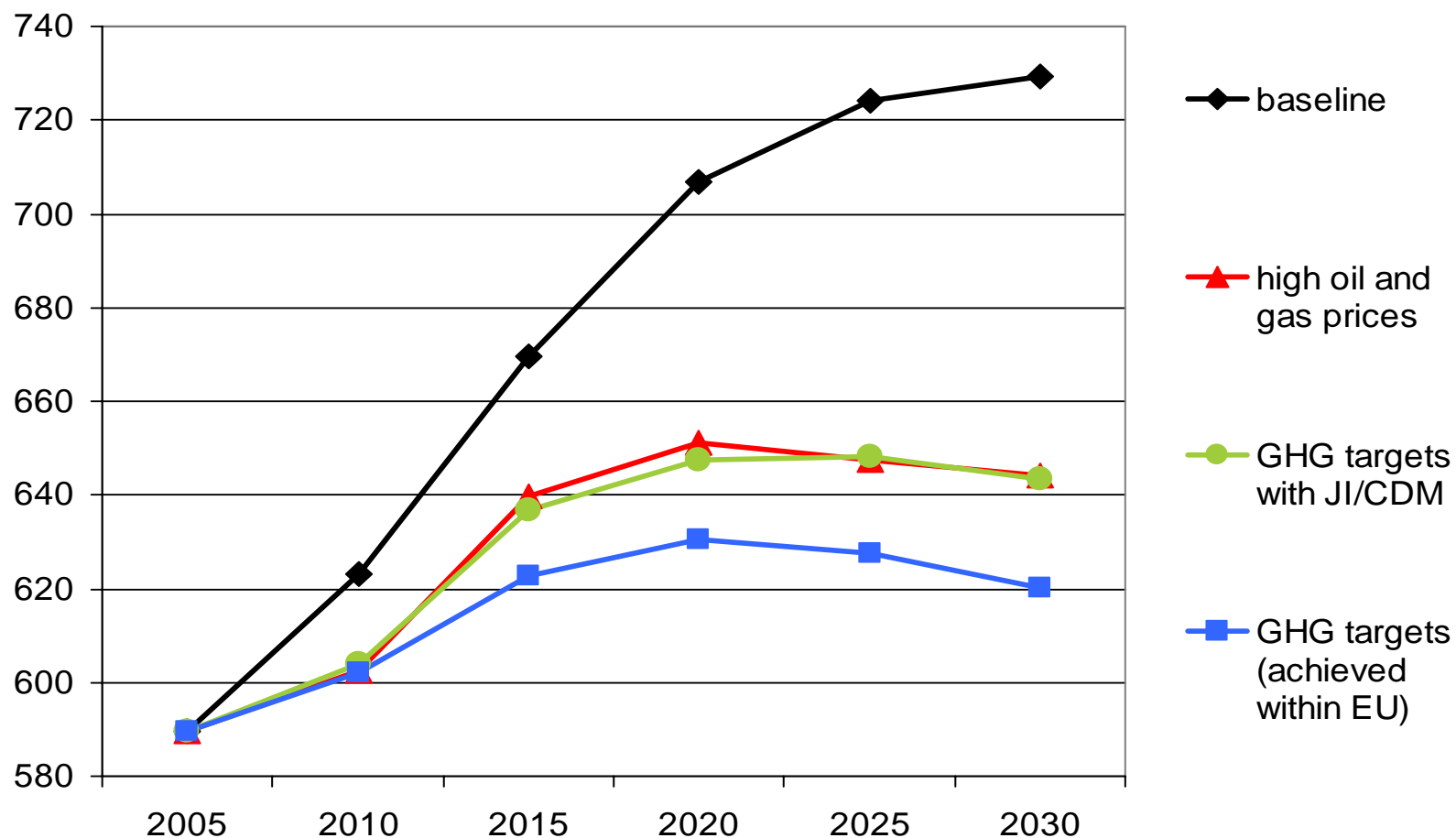
● Alternative scenarios

- Commission proposed in January 2008 ambitious policies to cut GHG emissions by 20% and to raise the RES share to 20% by 2020
- Two policy scenarios
 - » GHG target achieved with JI/CDM (1/4 of reduction outside EU)
 - » GHG target achieved without JI/CDM (whole reduction within EU)
- One scenario illustrating the effects of higher oil prices (100 \$(05)/b in 2020 and 119 \$/b in 2030 with gas prices following oil prices)

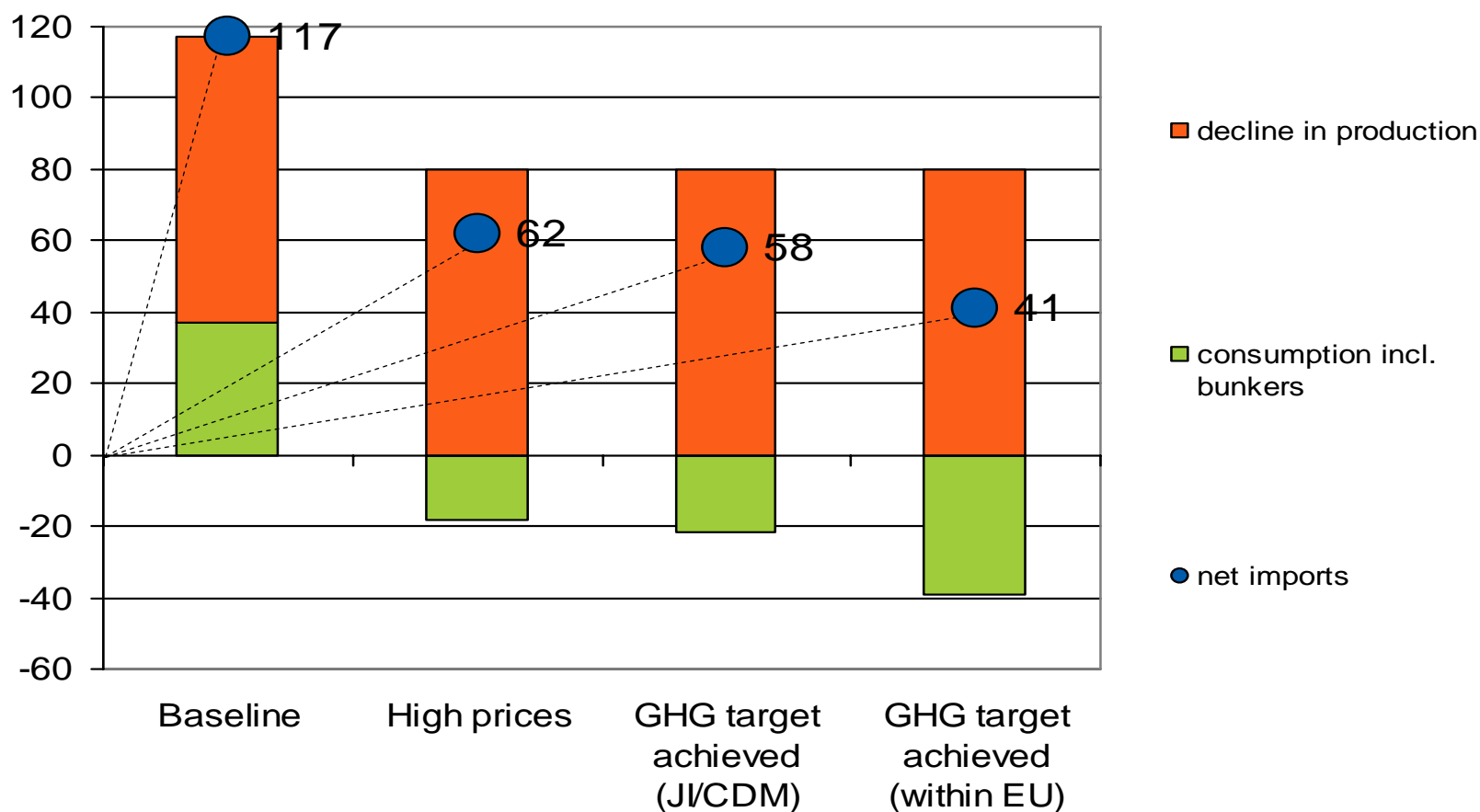
● EU-27: Greenhouse gas emissions (1990=100)



● EU-27: Net oil imports – Baseline and alternative scenarios (in Mtoe)

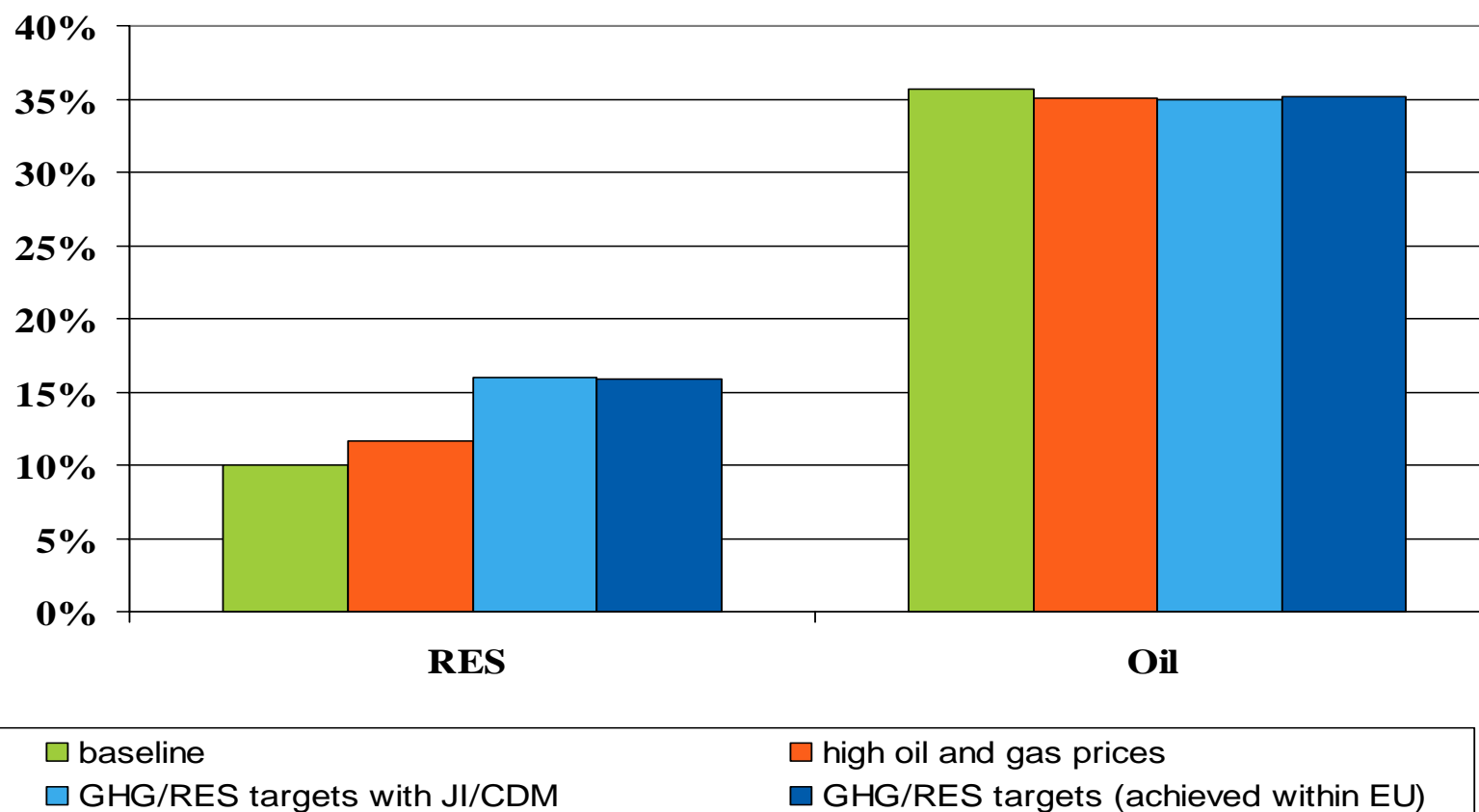


● EU oil import growth 2005 – 2020: decline in production and change in consumption (in Mtoe)






EU-27: Renewables and oil shares in primary energy in 2020 (with 20% RES share in final energy in policy cases)



Biofuels share in RES: 13.2% in baseline; 16% in HP; 11% in policy cases

● Conclusions

- Market developments shown in baseline point to:
 - » Challenge of rising CO₂ emissions
 - » Notwithstanding energy efficiency and structural changes in the economy, oil remains most important fuel due to strong growth of transport
 - » Pronounced decline in domestic oil production
- Very high oil prices have the same effect on oil imports as GHG/RES targets, but only achieve 1/3 of the GHG reduction
- In all cases oil imports will rise from today's level



Thank you
for your attention!