



AN ANALYSYS OF THE “EU ENERGY ROADMAP 2050” DOCUMENTS

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LIST OF MATHATERIALS PRESENTED TO THE GAC

- I. Draft analysis of the “Energy Roadmap 2050”
- II.1. Questions (based on “RM Impact Assessment” text) to scenarios’ authors (in preparation to coming meeting at the second half of May)
- II.2. Suggestions for further GAC report and conclusions on Item 1
- III. Working Paper on the analysis of the RM scenarios

This presentation is intended to highlight some relevant points of these documents.



GENERAL OBSERVATIONS



THE INTENDED PURPOSE OF THE EU ENERGY ROADMAP 2050

- The measures of the Energy 2020 strategy that stay beyond 2020 will lead to the reduction of GHG emissions up to 40% by 2050 – seems to be insufficient
- New commitment of the EU is to achieve 80-95% GHG emission reduction by 2050
- One of the key preconditions for achieving this goal is the context of necessary reductions by developed countries as a group. Another linked to it RM assumption is that as a result of such commitment global energy demand and global energy prices will be lowered in the long run

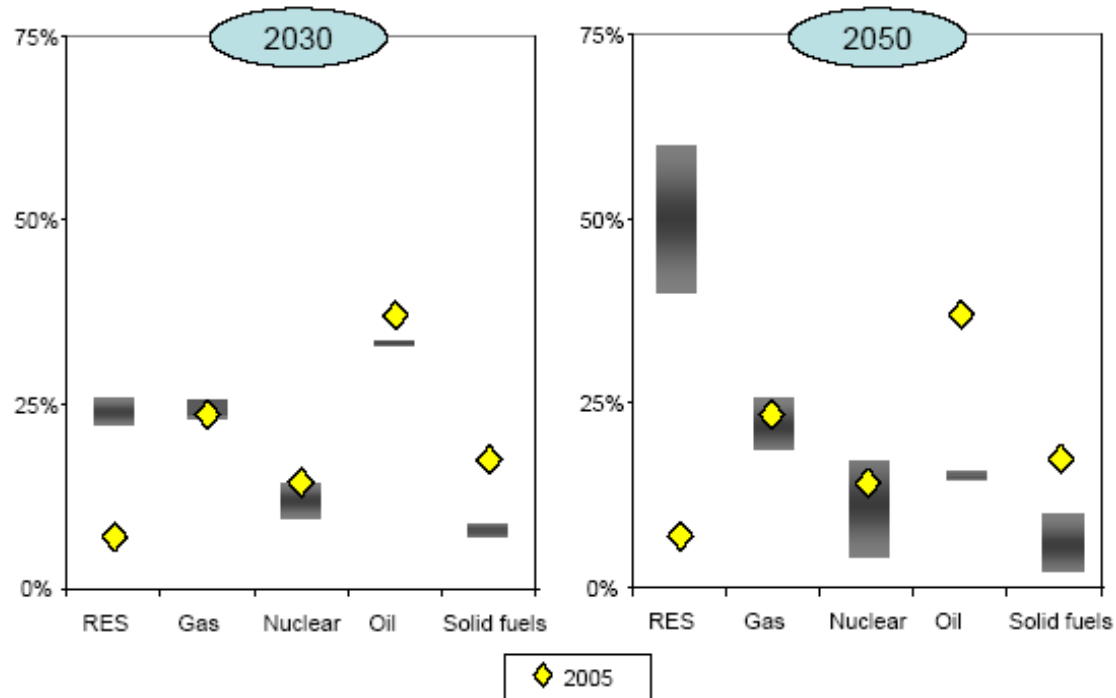


UNDERLYING NEED FOR AN INVESTMENT STRATEGY

- EU Energy system shall be *secure, sustainable & competitive*
- The task of developing post-2020 strategies is urgent
- Energy investments have long lead times before commercialization; new investment cycle is taking place in the current decade
- Uncertainty is the major barrier to investment planning

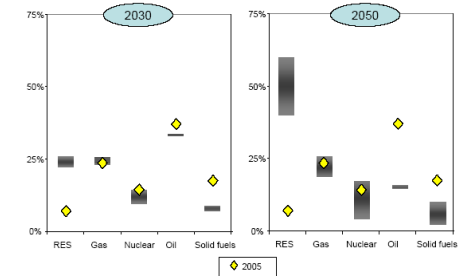
AN ILLUSTRATIVE DIAGRAM OF THE EU DECARBONISATION SCENARIOS

Graph 1: EU Decarbonisation scenarios - 2030 and 2050 range of fuel shares in primary energy consumption compared with 2005 outcome (in %)



SOME QUESTIONS IN RELATION TO THE DIAGRAM

Graph 1: EU Decarbonisation scenarios - 2030 and 2050 range of fuel shares in primary energy consumption compared with 2005 outcome (in %)



- *RM acknowledges that gas is an "accepted" transitional energy source. Why is this evidence not visibly reflected in the presented fuel mix dynamics?*
- The long-term future of gas in EU according to RM is directly linked with CCS technologies, which are still at the demonstration stage – it has to be commercially viable by 2030
- The expected in RM transformation of the EU energy sector is massive. Nevertheless, reported investment needs for decarbonization scenarios are not much different from that for "BAU" scenarios
- Has the social impact on the EU citizens due to proposed in RM transformation been estimated (though it is mentioned that energy costs burden for them and economy as a whole will significantly increase)?



ILLUSTRATIVE FIGURES OF TRANSFORMATION SCALE

	2005	2030	2050
Gross energy consumption, mtoe	1800	1500	1200
RES share, %/mtoe	7%/126	22%/330	50%/600
Corresponding RES capacity under the full load, GW	167	437	795
Solids share, %/mtoe	17%/306	10%/150	10%/120
Oil share, %/mtoe	37%/666	34%/510	15%/180



**ANALYSIS OF THE
“IMPACT ASSESSEMENT PAPER”**



MIMICKING THE “ENERGY ROADMAP 2050” SCENARIOS

- Approach: an attempt to reproduce the (published) assumptions embedded in the Roadmap scenarios by fixing the PRIMARY and FINAL demands as well as constraints/targets and using well-established modeling principles for energy transformation sector (MESSAGE model)
- Observations: hypothetical technical and economical assumptions which were made but not published; inconsistencies revealed and pointed out for further discussions

SUSPECTED INCONSISTENCIES IN INPUT DATA AND SCENARIO ASSUMPTIONS (see Paper III)

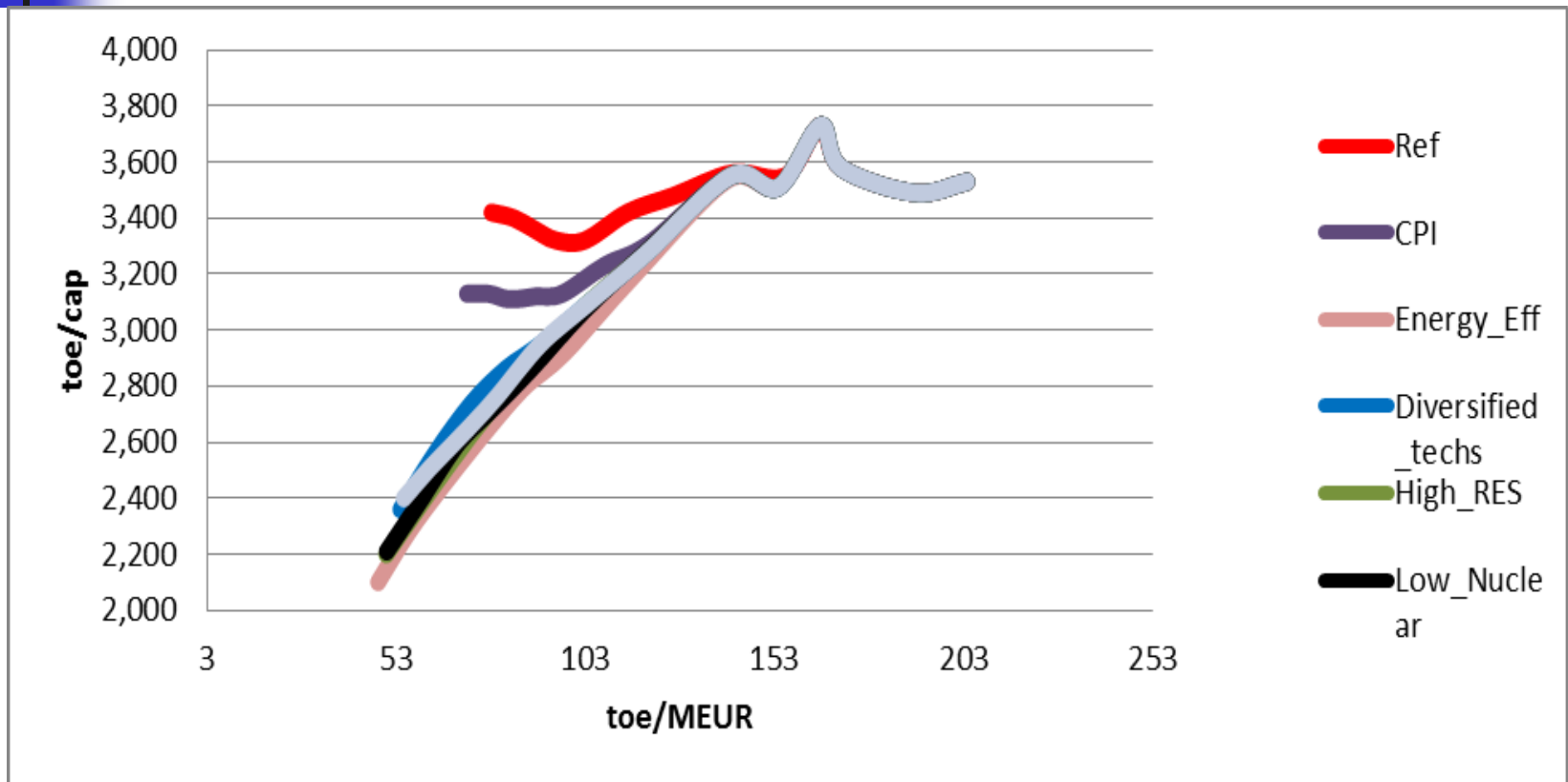


- Mismatch of full energy balance
- No break-down of final energy “per fuel per sector”. No information about CHPs
- Flaws in reporting CO₂ content per fuel, this content changes across scenarios and time periods
- Difference in the assumed efficiency between scenarios is not significant (same pattern notwithstanding great variety of scenarios?)



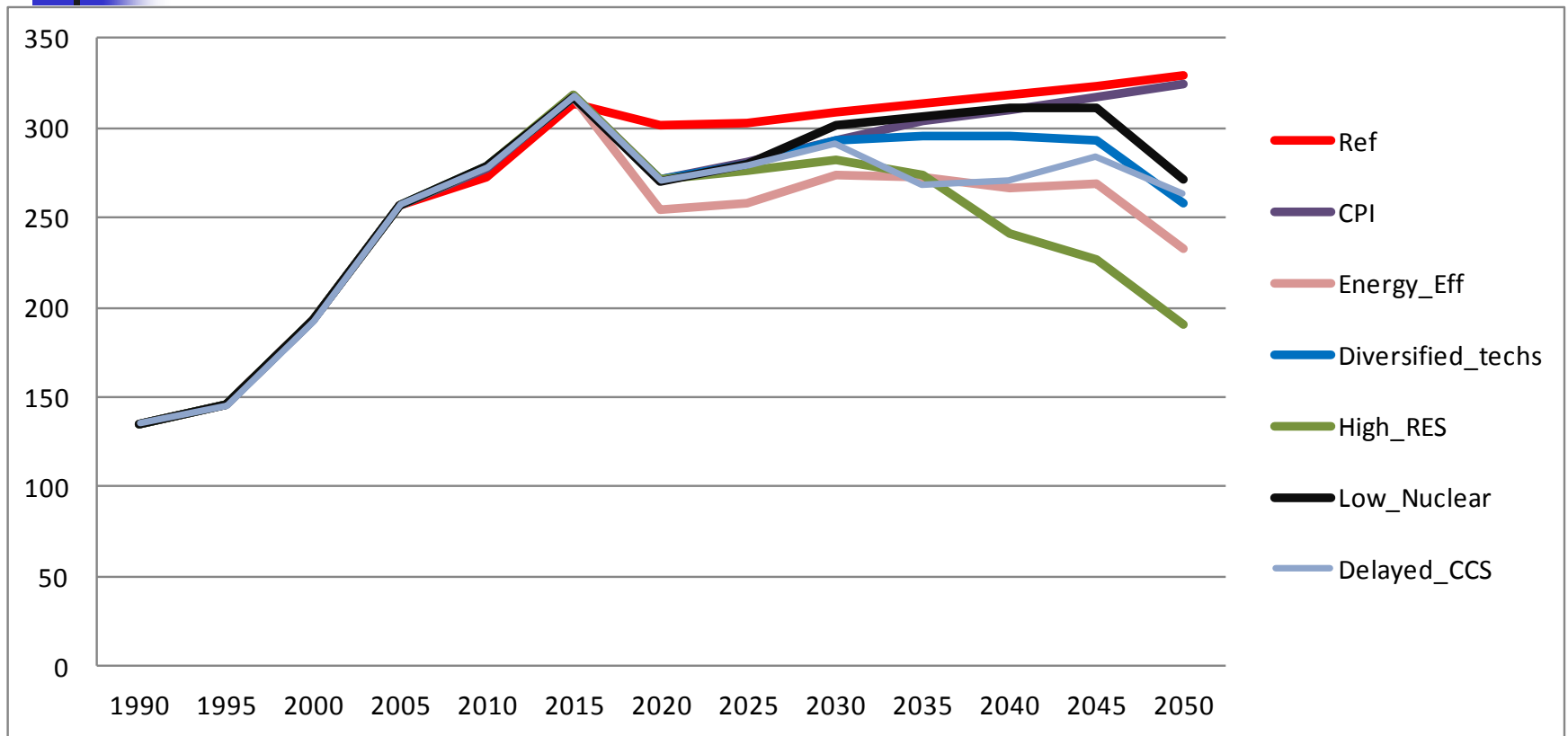
UNEXPLAINED DYNAMICS OF SOME INDICATORS

FINAL ENERGY CONSUMPTION PER CAPITA vs. ENERGY INTENSITY OF GDP



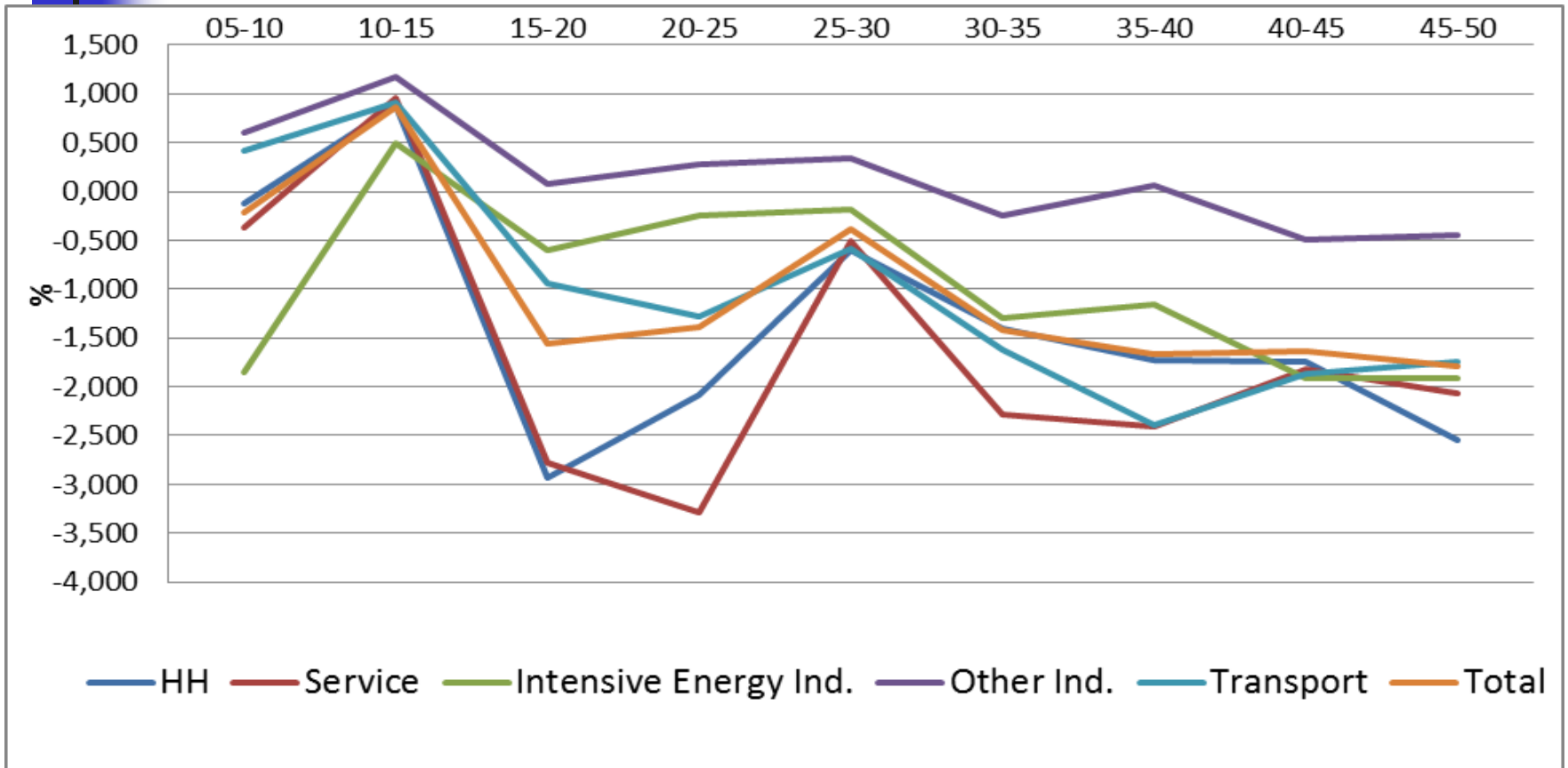
1. Why all decarbonisation scenarios follow the same track?
2. Why CPI and Ref paths are non-monotoneus?

GAS IMPORTS TO THE EU



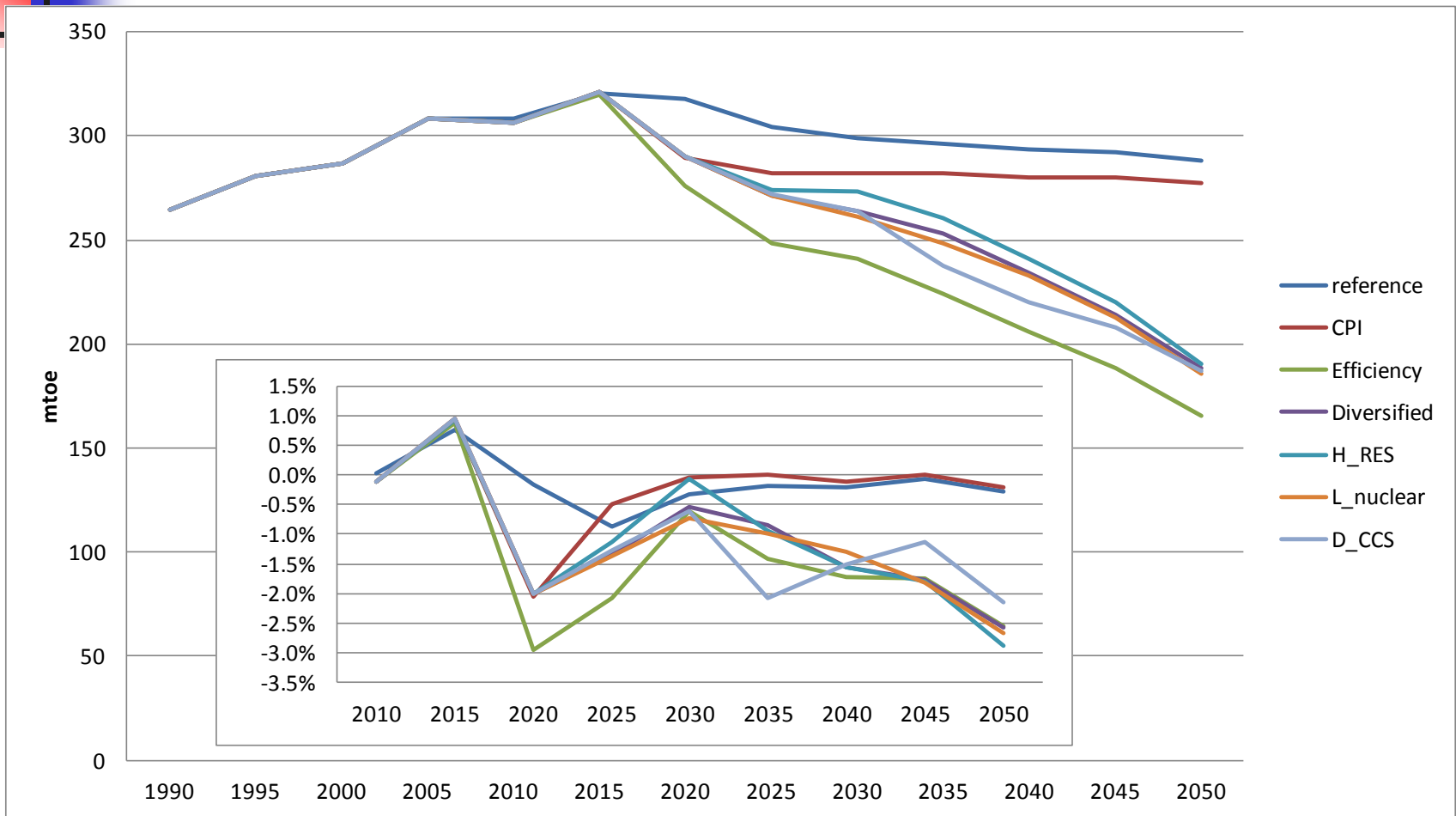
1. Why such unexplainable behavior in CPI in 2015-2020 and then after 2020?
2. Same up to certain extent for other scenarios

ANNUAL GROWTH OF FINAL ENERGY DEMAND BY SECTOR, % (Energy efficiency scenario)



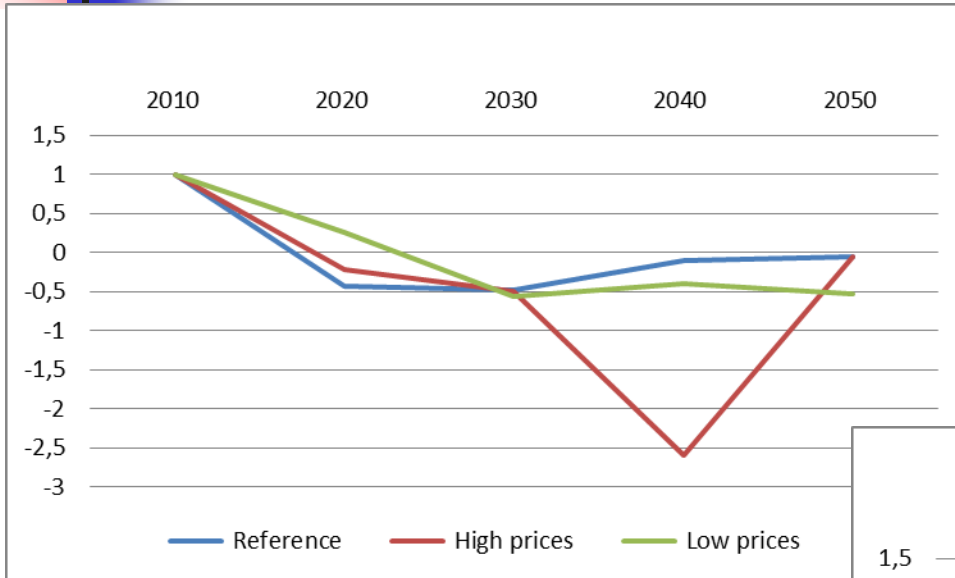
1. What can happen in the EU economy to explain such erratic behavior?

HOUSEHOLDS FINAL ENERGY DEMAND BY SCENARIO AND ITS ANNUAL RATES



1. Similar as in previous slide dynamics per scenario
2. Social impact?

OIL AND GAS PRICE ELASTICITY



Oil demand



Gas demand



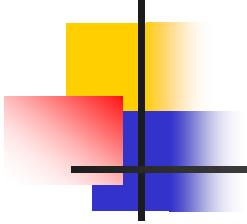
SOME QUESTIONS

- What is the realistic assessment of feasibility of decarbonisation scenarios: a) from the perspective of technologies penetration; b) from the incurred costs (massive electricity grids, biomass infrastructure, etc.)?
- What is the social impact of final energy costs?
- Why a “conventional/commercial-technology” scenario was ignored (Experts have revealed that the RM-2050 targets can be achieved without massive involvement of CCS and hydrogen storage – to be discussed at expert level)?
- How to move CPI scenario (actual till 2030) to better consistency with conventional views of experts?



NEXT STEPS

- Meeting with RM scenarios authors to reduce list of questions (second half of May)
- Meeting with experts on causes of differences for 2030 horizon (second half of May)
- Collaboration with risks analysis and Cooperation RM progress – in forming preliminary GAC recommendations (early June)
- Contributions to draft Report on Workstream 1 (June)
- Presentation at the Fourth GAC meeting (late July)



THANK YOU FOR YOUR ATTENTION!