

# IMPACTS OF HIGH OIL PRICES ON TRANSPORT AND THE EUROPEAN ECONOMY

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Dr. Michael Krail

Fraunhofer-ISI



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# Agenda

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- Introduction – the HOP! Project
- Impact chains – direct and indirect impacts of high oil prices
- Modelling framework – ASTRA and POLES
- Scenarios – possible oil price developments
- Results – macroeconomic impacts of high oil prices
- Conclusions

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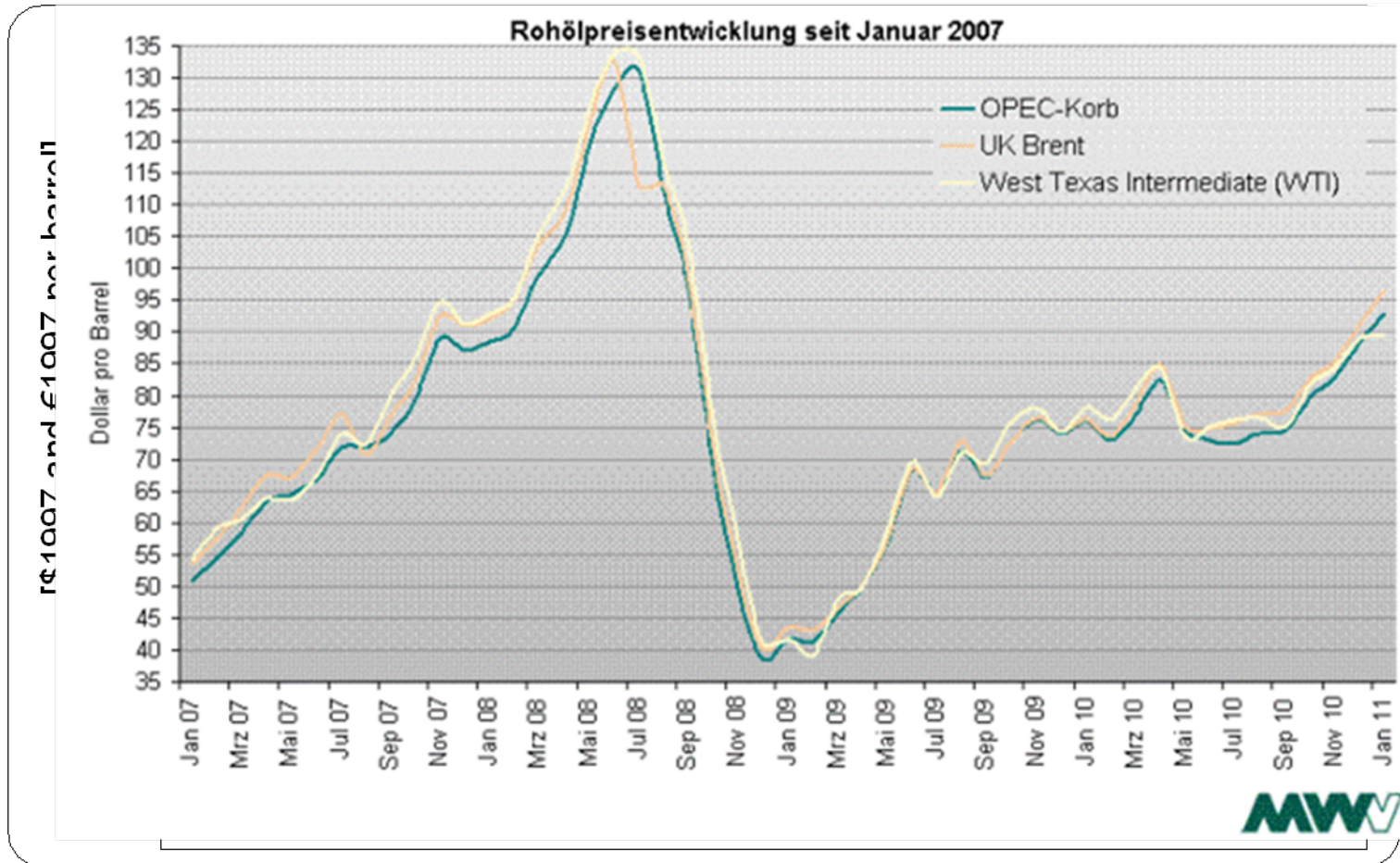
# Introduction – current situation

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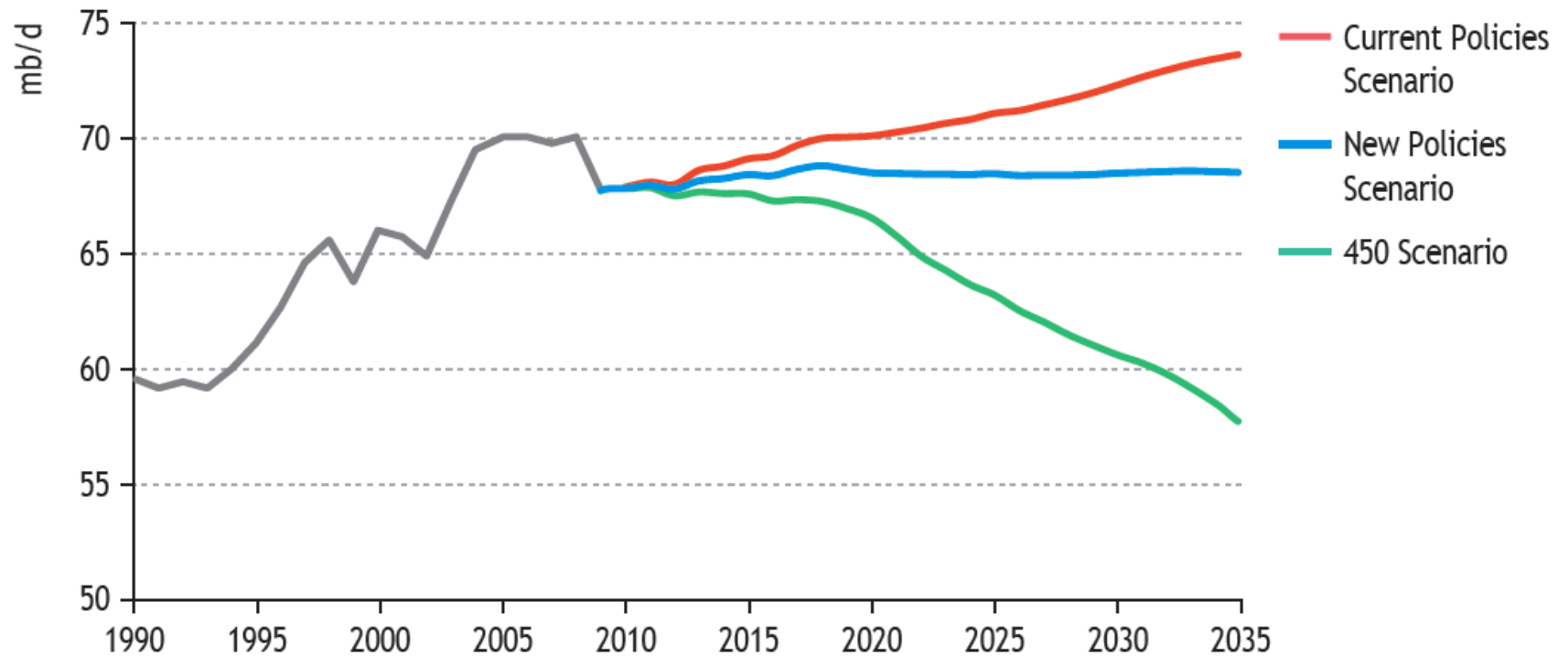
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- Steeply rising oil prices in the last months
- Only short breakdown in the months of the Economic Crisis 2008/2009
- Governments revise previous GDP growth estimations due to high oil prices
- Reduction of oil production due to political instability in oil exporting countries like Libya
- Strong economic growth in China, India and Brazil induces higher energy demand
- Current oil price highs reflect a demand-supply gap to larger extent than previous oil price highs
- Oil intensity of the EU economy and the transport system further decreases, alternative fuel technologies close to being competitive

# Development of oil prices



# World oil production



Source: ~~World Energy Outlook 2007~~ World Energy Outlook 2007

# Macro-economic impact of high oil price in Europe – the HOP! project

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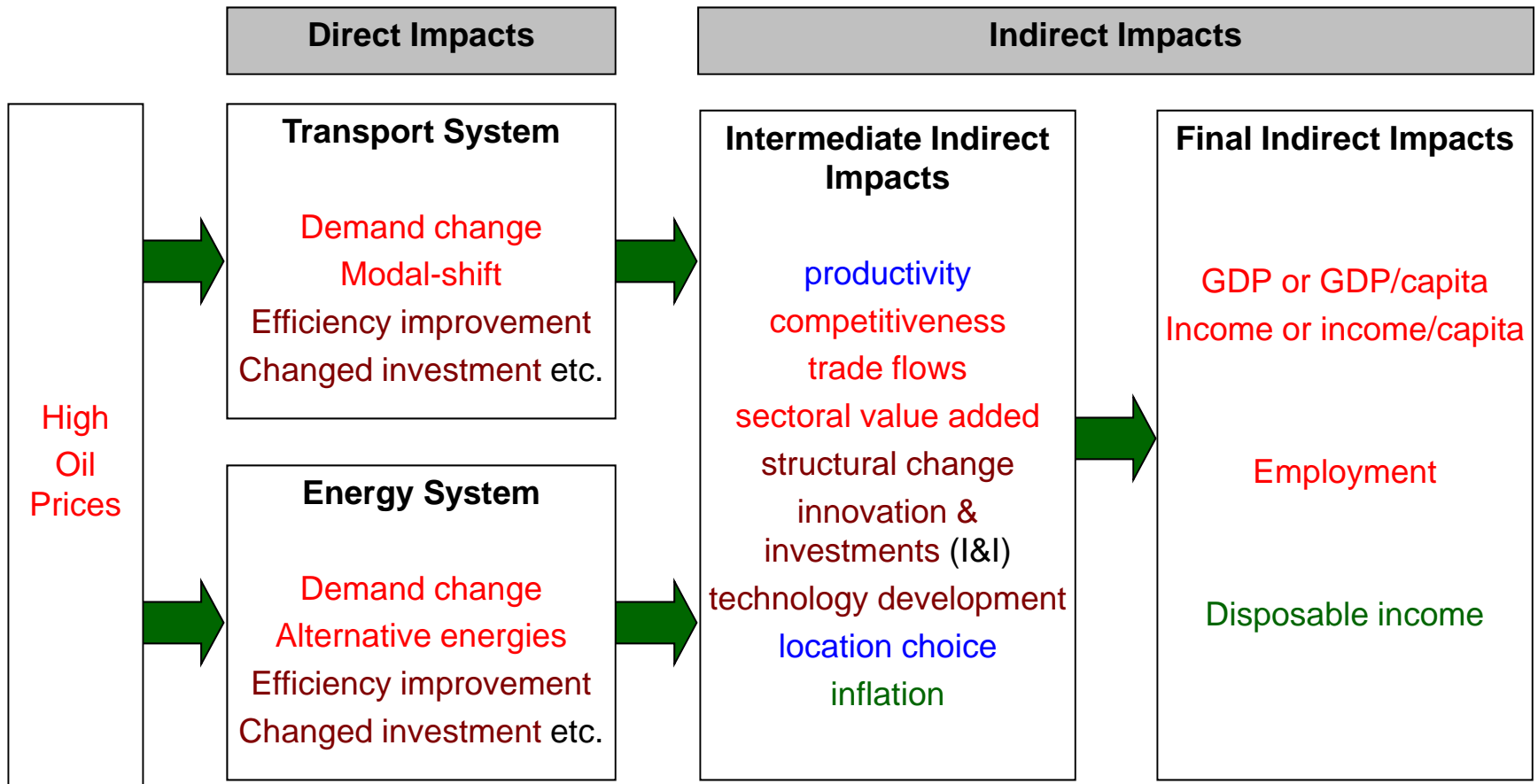
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- Project co-funded by EC DG Research, coordinated by TRT (Milan) with Fraunhofer-ISI (Karlsruhe) and EC DG JRC (IPTS, Seville)
- Quantitative and qualitative analysis of direct and indirect impacts of long-term oil price escalation on European economy, transport and energy system
- System Dynamics modelling approach linking global partial equilibrium energy model POLES with macro-economic, transport, technology and environmental model ASTRA
- Analysis of a set of possible oil price scenarios differing in oil price increase, timing and steepness of increment and policy reaction



[www.hop-project.eu](http://www.hop-project.eu)

# Direct and indirect impacts of high oil prices



Source: HOP! project

High    Low    Low+Exogenous    Exogenous

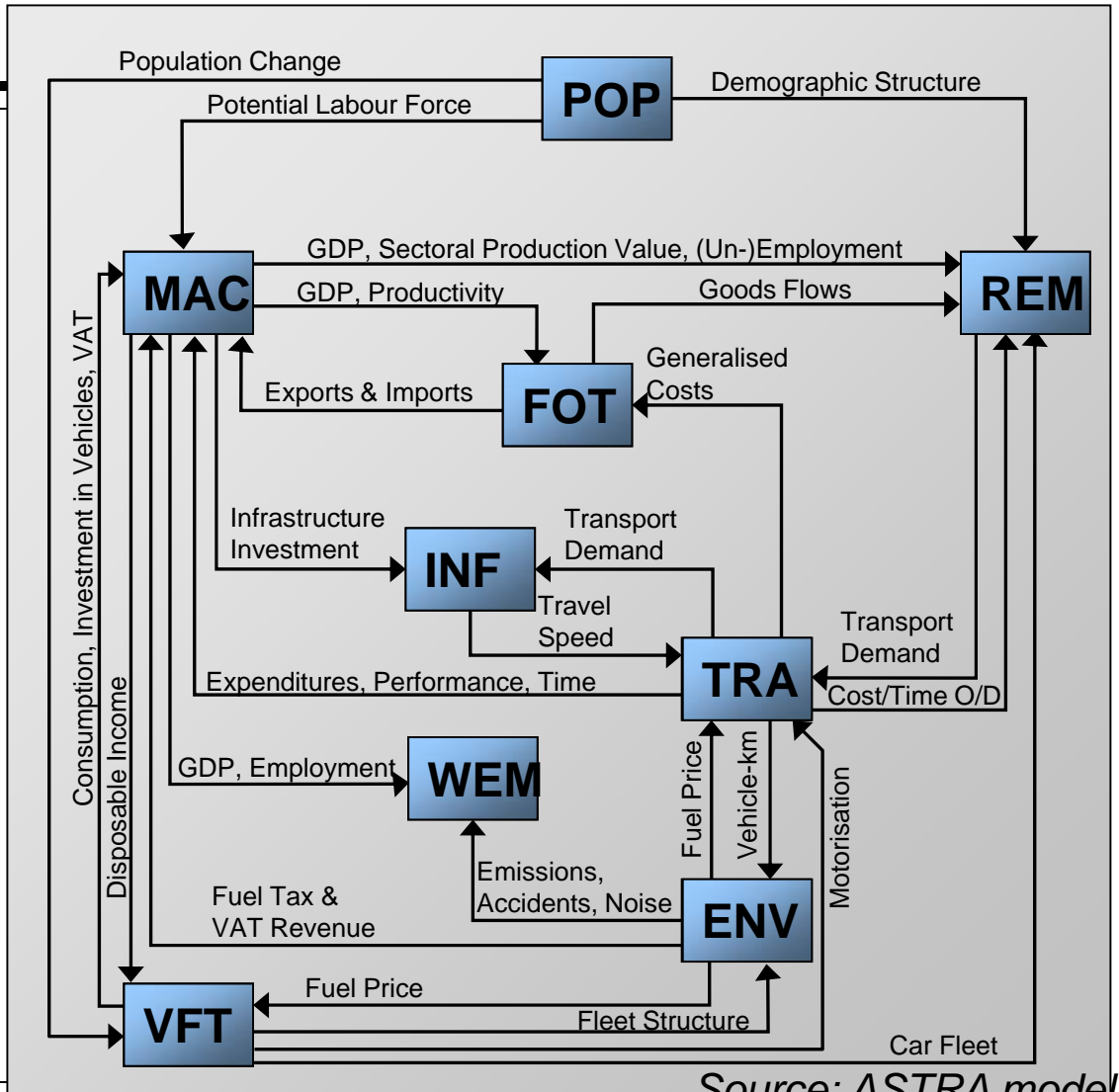
# Modelling framework

## The ASTRA model

### ASSessment of TRansport Strategies

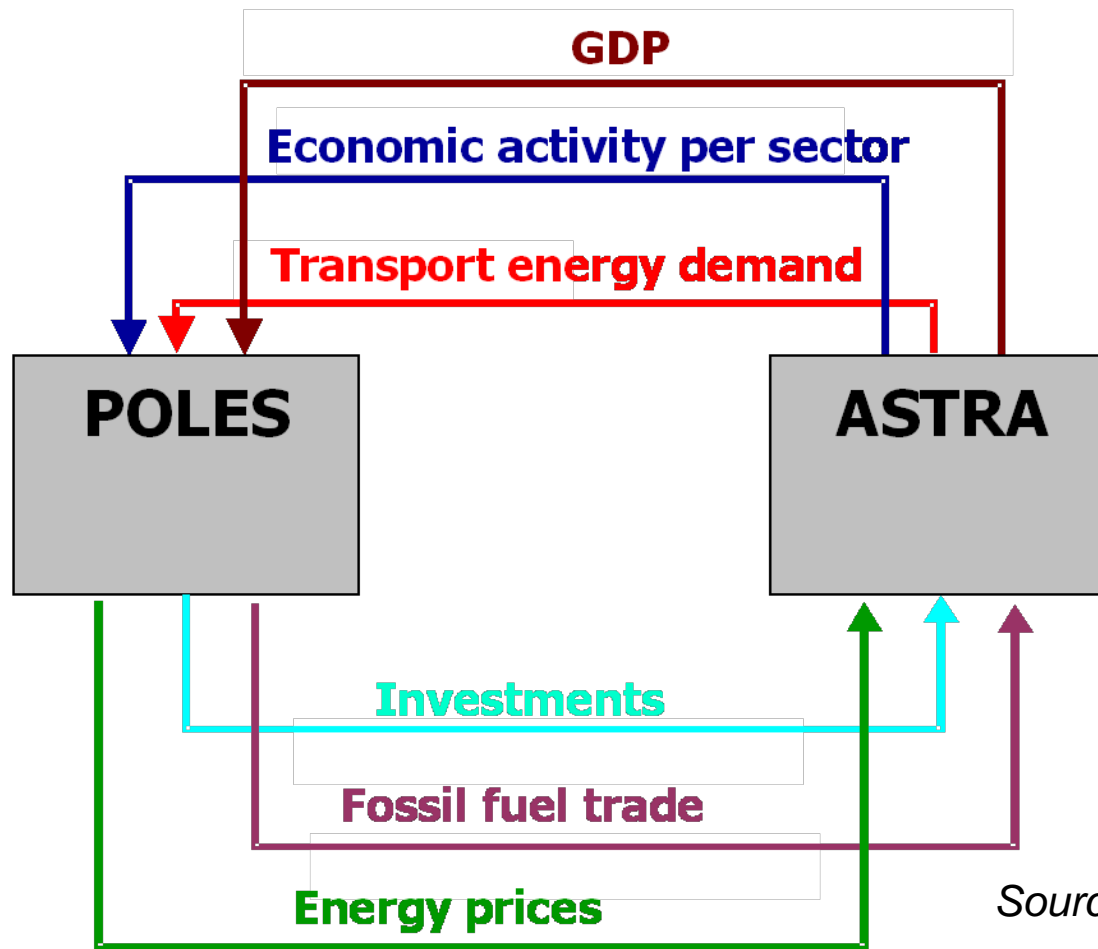
#### Abbreviation of 9 Modules:

- POP = Population Module
- MAC = Macroeconomics Module
- REM = Regional Economics Module
- FOT = Foreign Trade Module
- TRA = Transport Module
- VFT = Vehicle Fleet Module
- ENV = Environment Module
- INF = Infrastructure Module
- WEM = Welfare Measurement Module



Source: ASTRA model

# Linkage between ASTRA and POLES

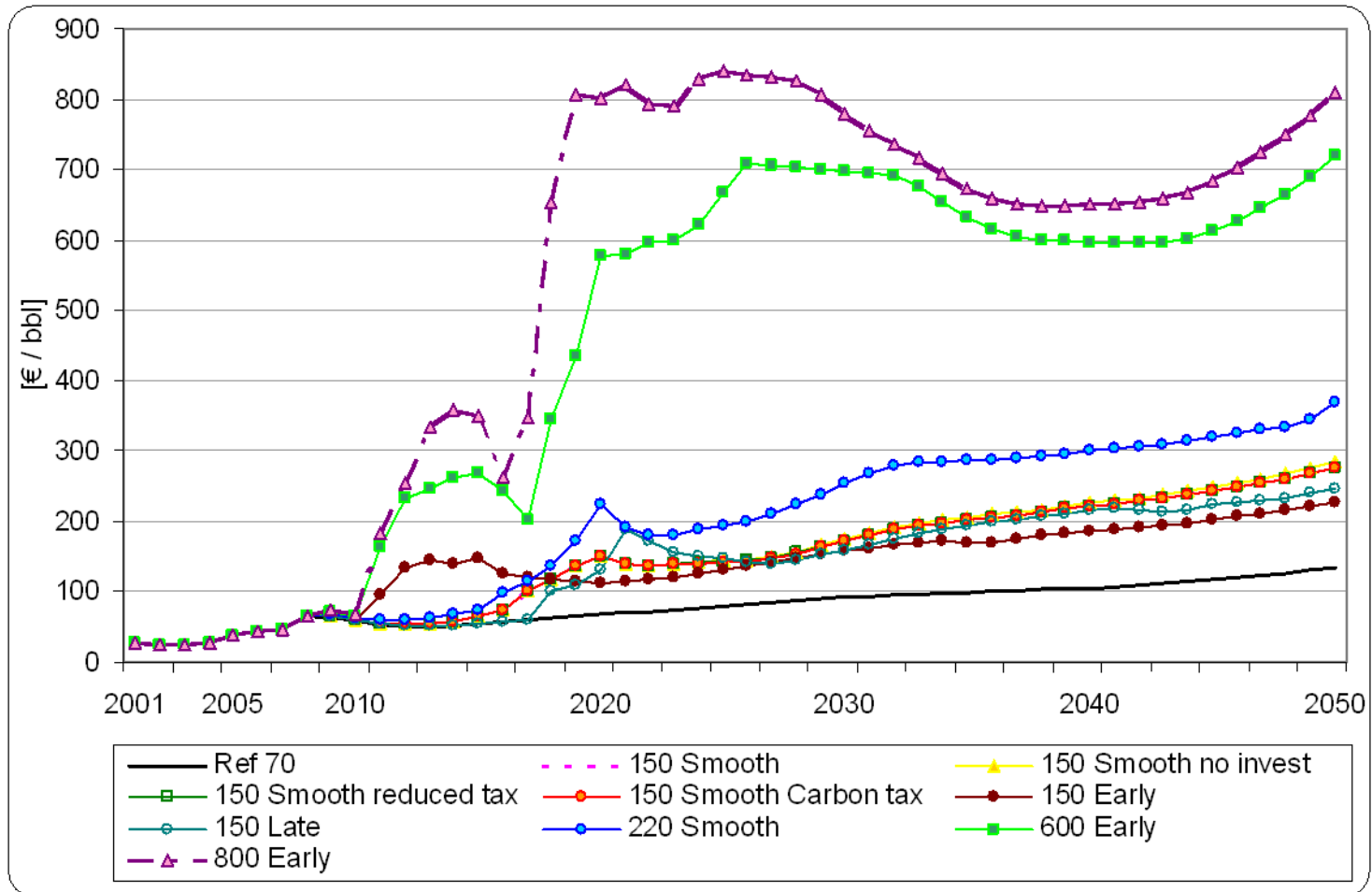


Source: HOP! project

# Scenarios assessed in HOP!

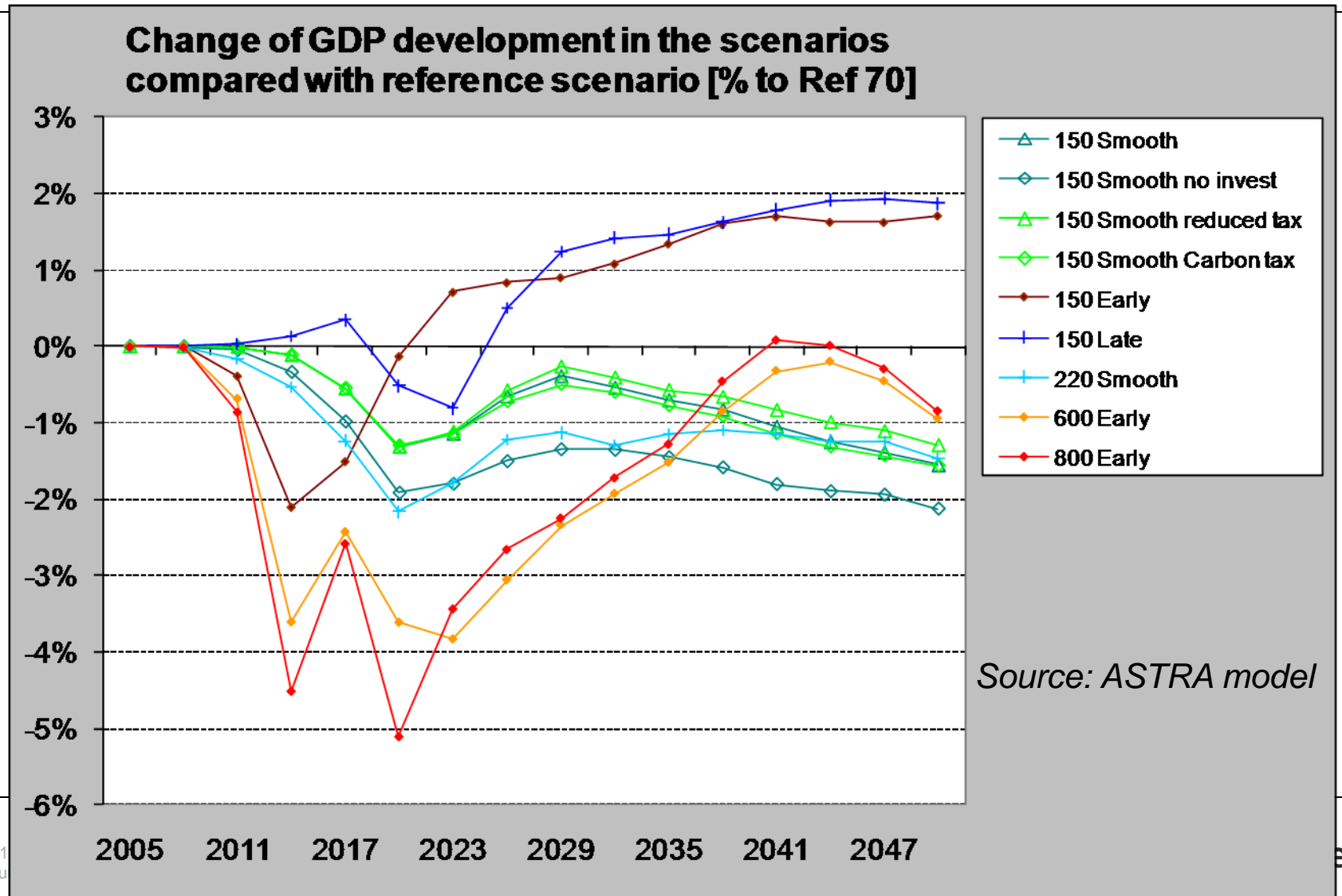
Scenario name	Oil price in 2020 (€ <sub>2000</sub> /bbl)	Investment size	Investment target	Fuel taxes	Price growth path
Ref 70	70	Low	Efficiency & New Sources	EU directives	Stable
150 Smooth	150	High	Efficiency & New Sources	EU directives	Smooth rise
150 Smooth no invest	150	Low	Neither	EU directives	Smooth rise
150 Smooth reduced tax	150	High	Efficiency & New Sources	Reduced Tax	Smooth rise
150 Smooth carbon tax	150	High	Efficiency & New Sources	Carbon Tax	Smooth rise
150 Early	150	High	Efficiency & New Sources	EU directives	Early Step
150 Late	150	High	Efficiency & New Sources	EU directives	Late Step
220 Smooth	220	Very High	Efficiency & New Sources	EU directives	Smooth rise
600 Early	600	High	Efficiency & New Sources	EU directives	Early Step
800 Early	800	High	Efficiency & New Sources	EU directives	Early Step

# Overview on oil price trends

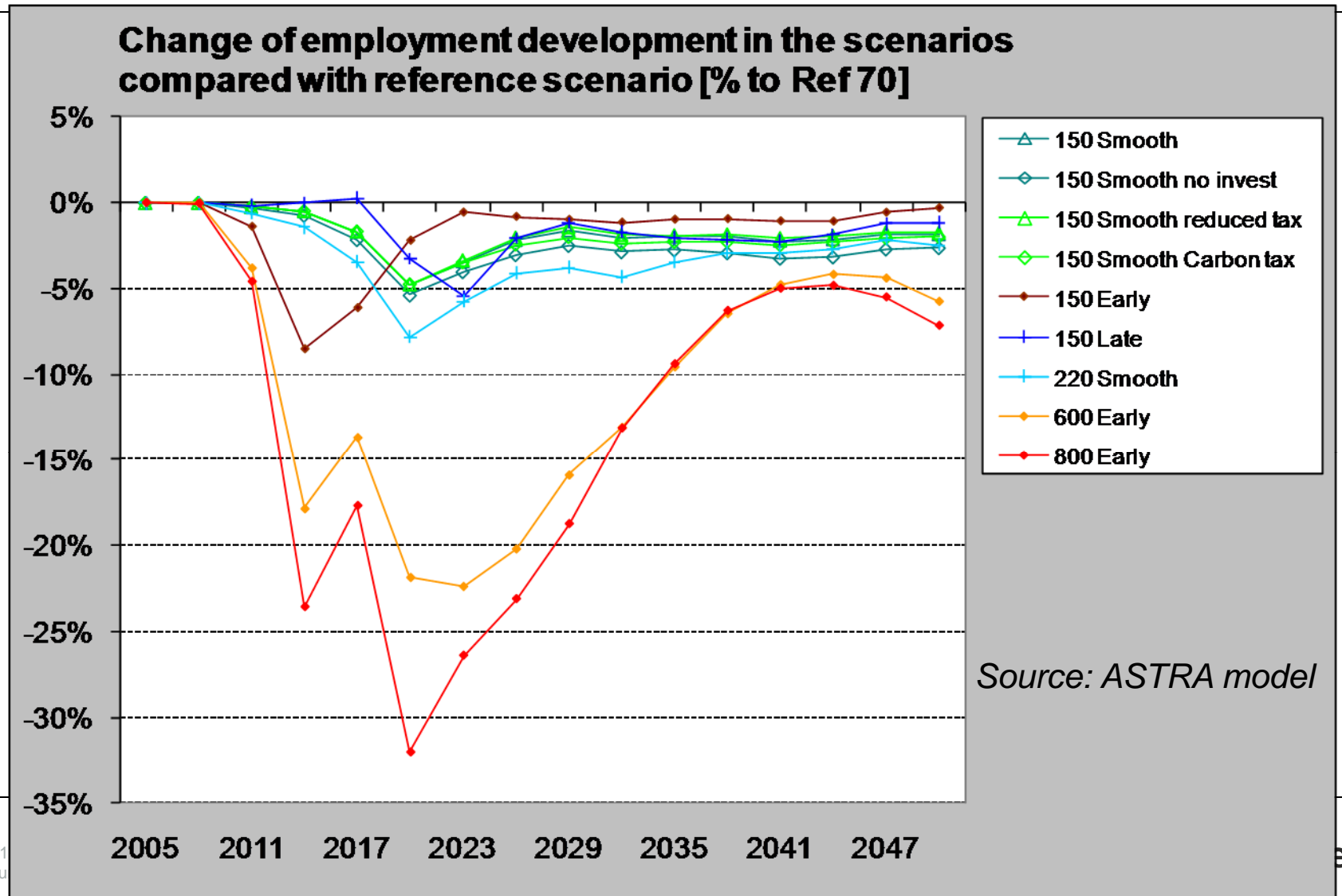


Source: ASTRA model

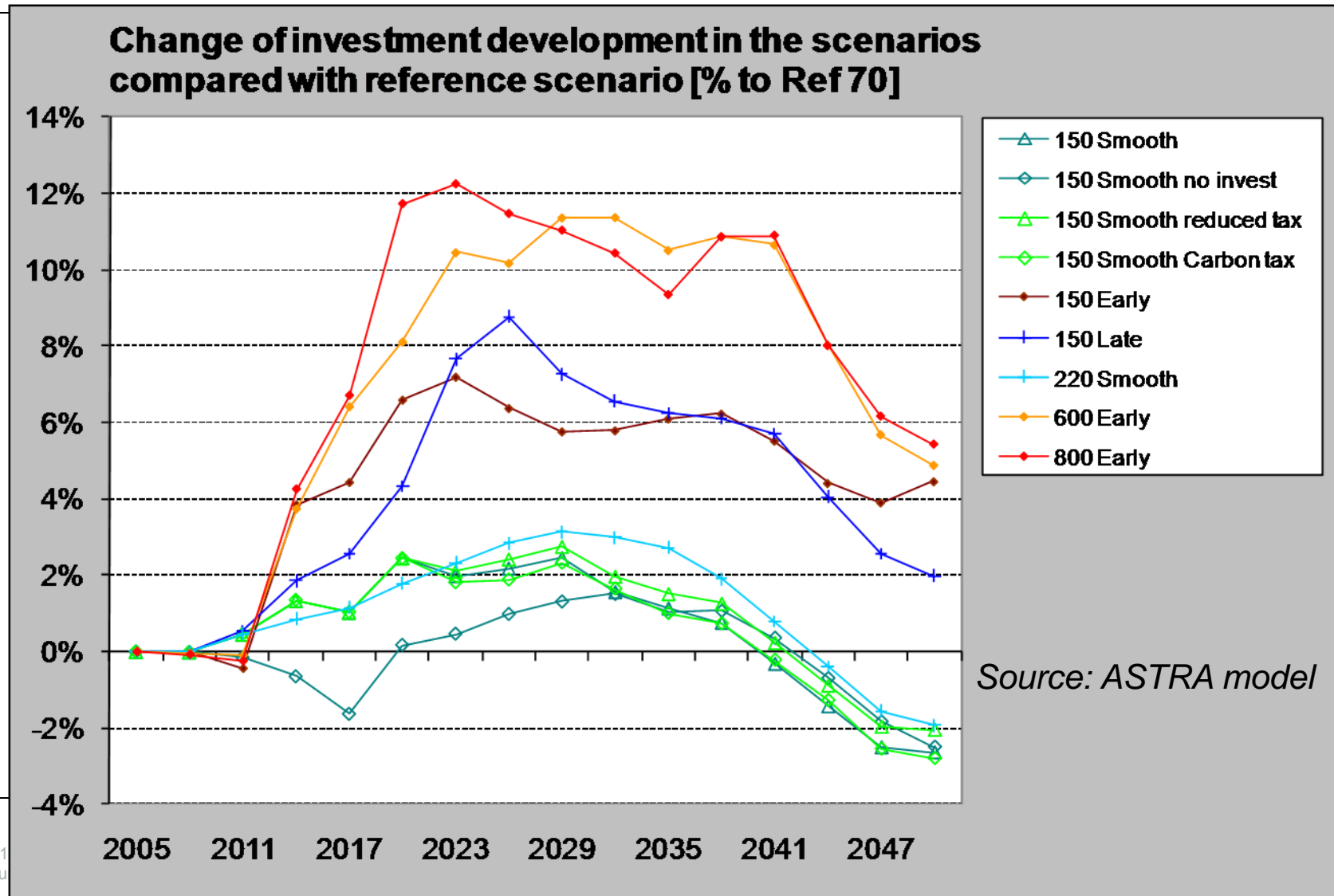
# Overview – impacts on GDP in EU27



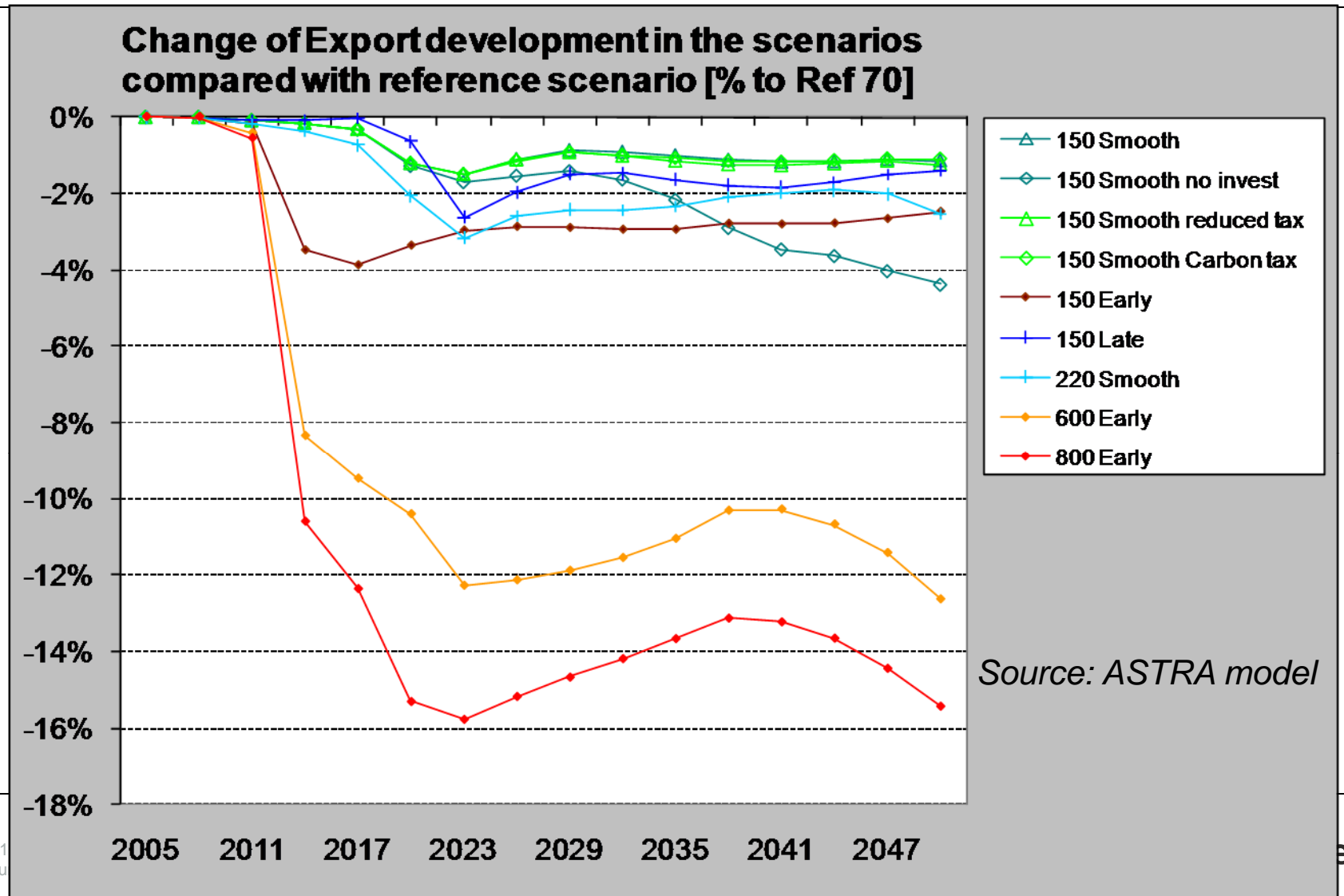
# Overview – impacts on labour markets in EU27



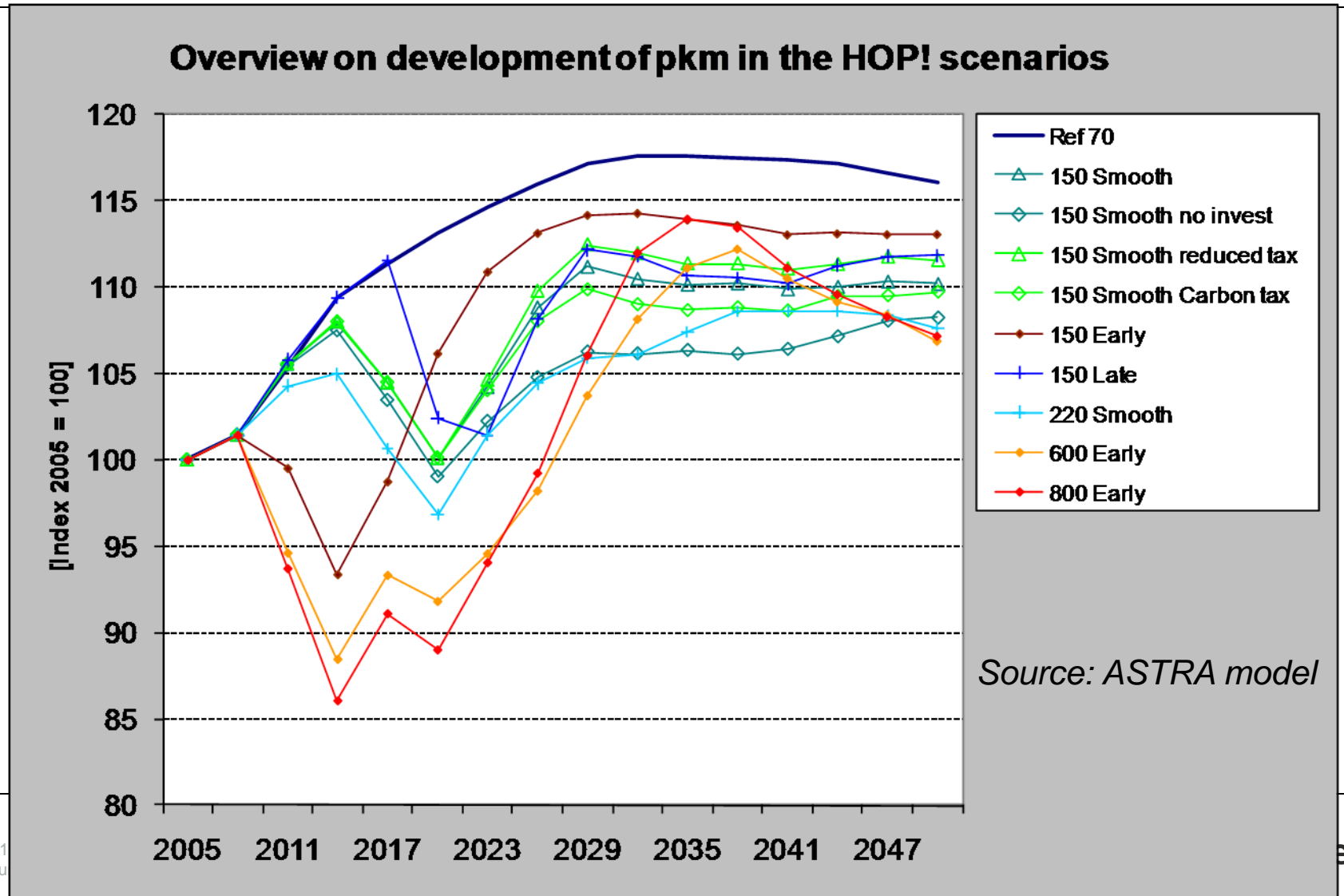
# Overview – impacts on investment in EU27



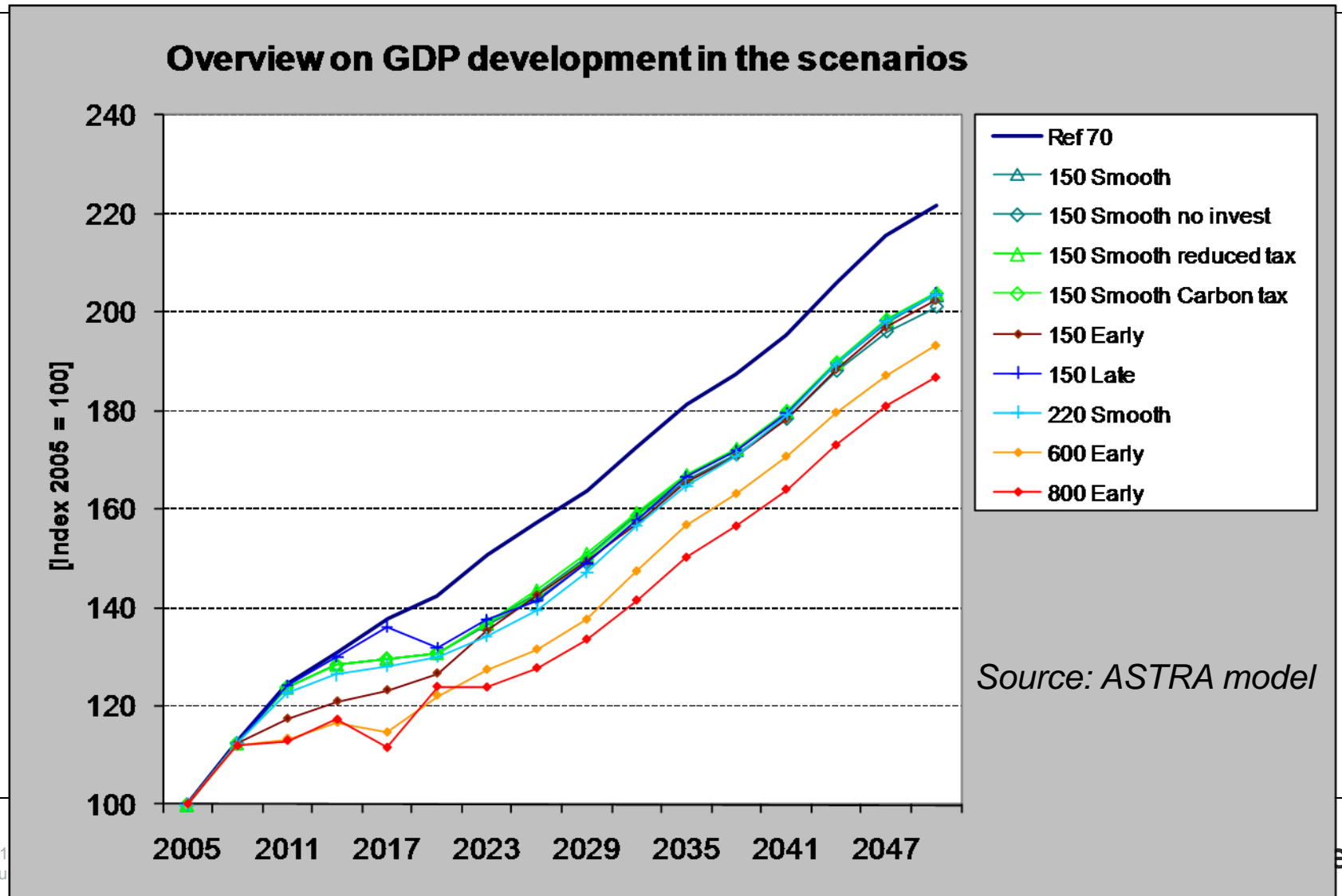
# Overview – impacts on exports in EU27



# Overview – impacts on passenger transport performance in EU27



# Overview – impacts on freight transport performance in EU27



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# Conclusions 1/2

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- GDP and employment negatively affected during peak period of oil price increase
- Impact on GDP limited (between + and – 2% compared with REF)
- Impact after this period depends on mechanisms kicked-off by price increase:
  - Investment into energy efficiency and alternatives could lead to positive economic impact in medium and long-term (and reduce future vulnerability)
  - Recession or insufficient energy supply would even multiply negative impacts

# Conclusions 2/2

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- Different effects of rapid price increase:
  - short-term: inertia of industry hampers mobilization of alternative sources -> strong negative impact on GDP
  - medium and long-term: shock triggers compensating mechanisms like investments into energy efficiency and alternative energy sources
- Impact on labour market depends on how the energy sector can forward price increase to other sectors:
  - full forwarding: strong loss of employment
  - limited forwarding: reduces negative impacts on employment; energy companies need to invest into technology

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# Thank you for your attention

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## Contact:

Dr. Michael Krail

Phone: +49 721 6809 429

Email: [michael.krail@isi.fraunhofer.de](mailto:michael.krail@isi.fraunhofer.de)

Fraunhofer-ISI

Institute for Systems and Innovation Research

Breslauerstr. 48, 76139 Karlsruhe, Germany

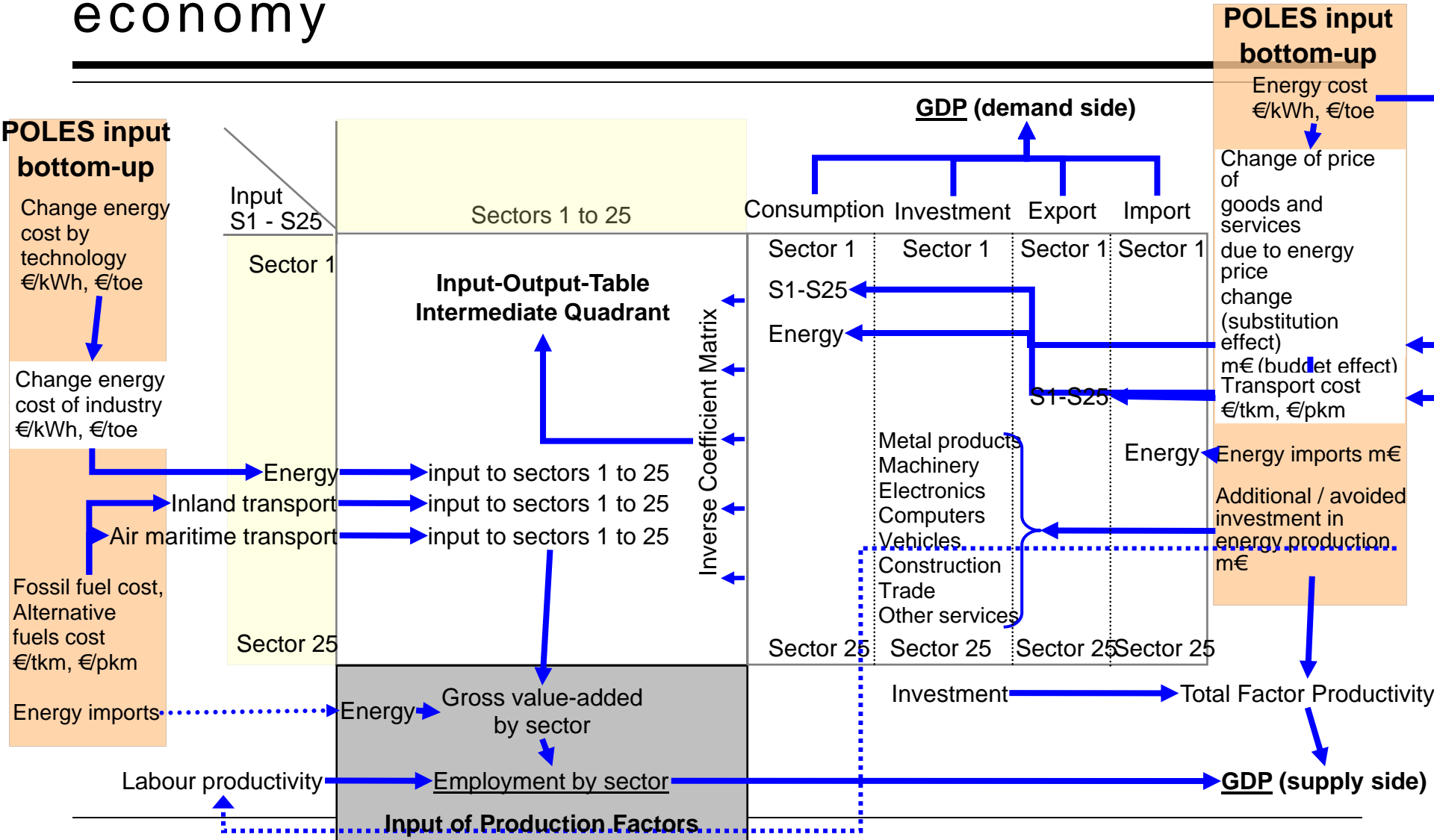
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# Backup slides

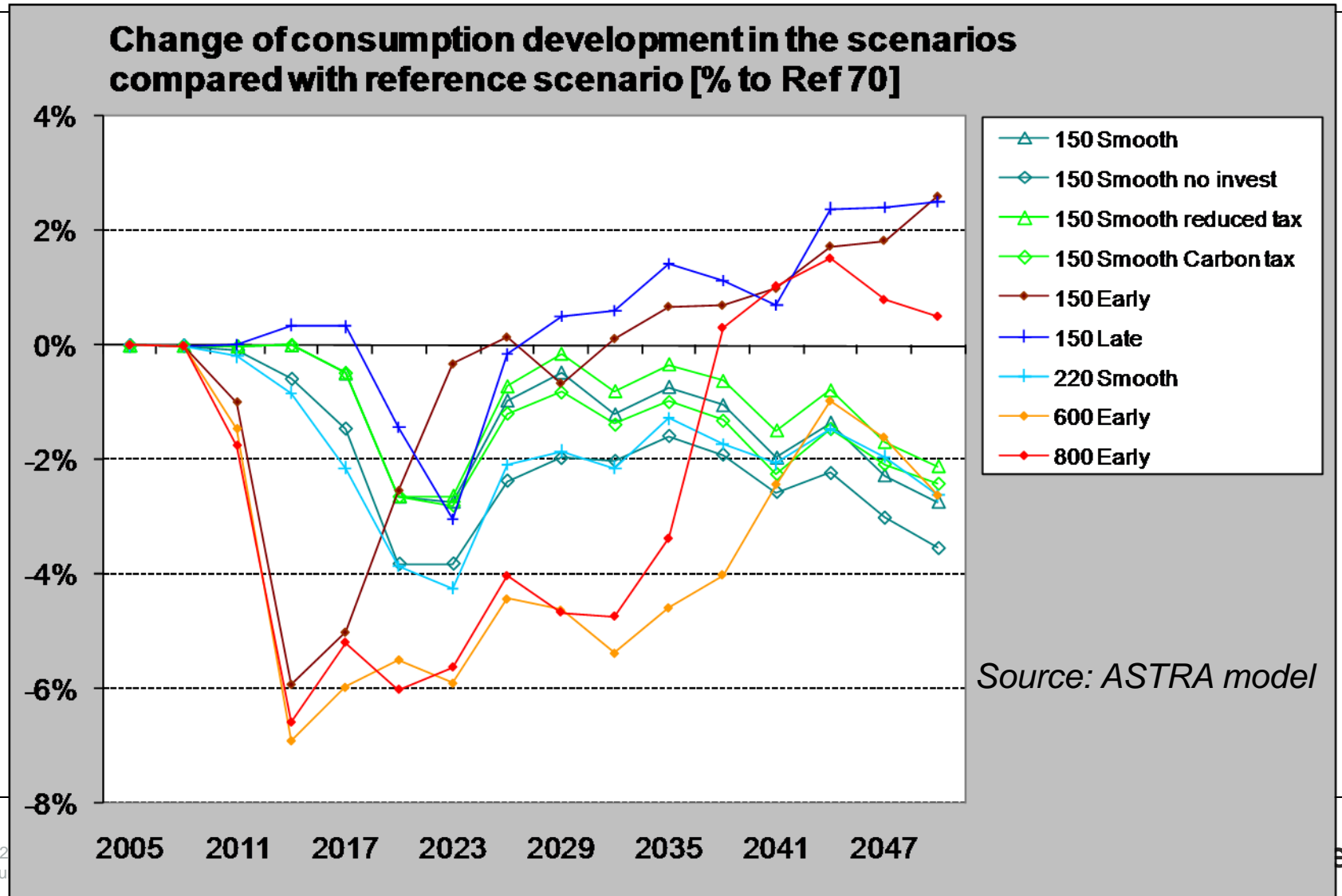
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# Linking bottom-up influences to the macro-economy



# Overview – impacts on private consumption in EU27



# Overview – impacts on GHG emissions from transport in EU27

