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# MULTIPLE IMPACTS OF ENERGY EFFICIENCY

A comprehensive indicator approach

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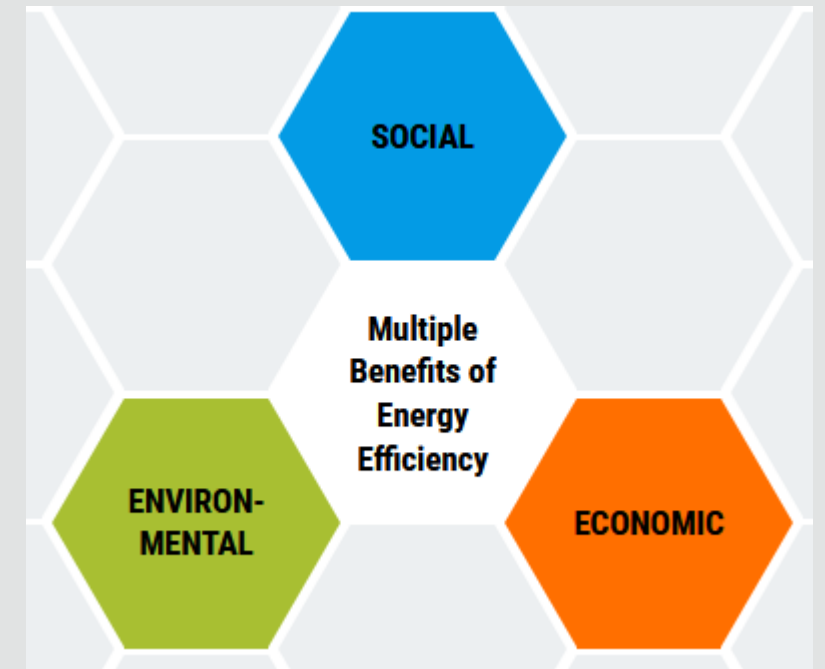
Energy Evaluation Europe's 2021 Virtual Conference on "*Accelerating the Energy Transition for All*"  
London, United Kingdom, March 15-16, 2021

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# Introduction

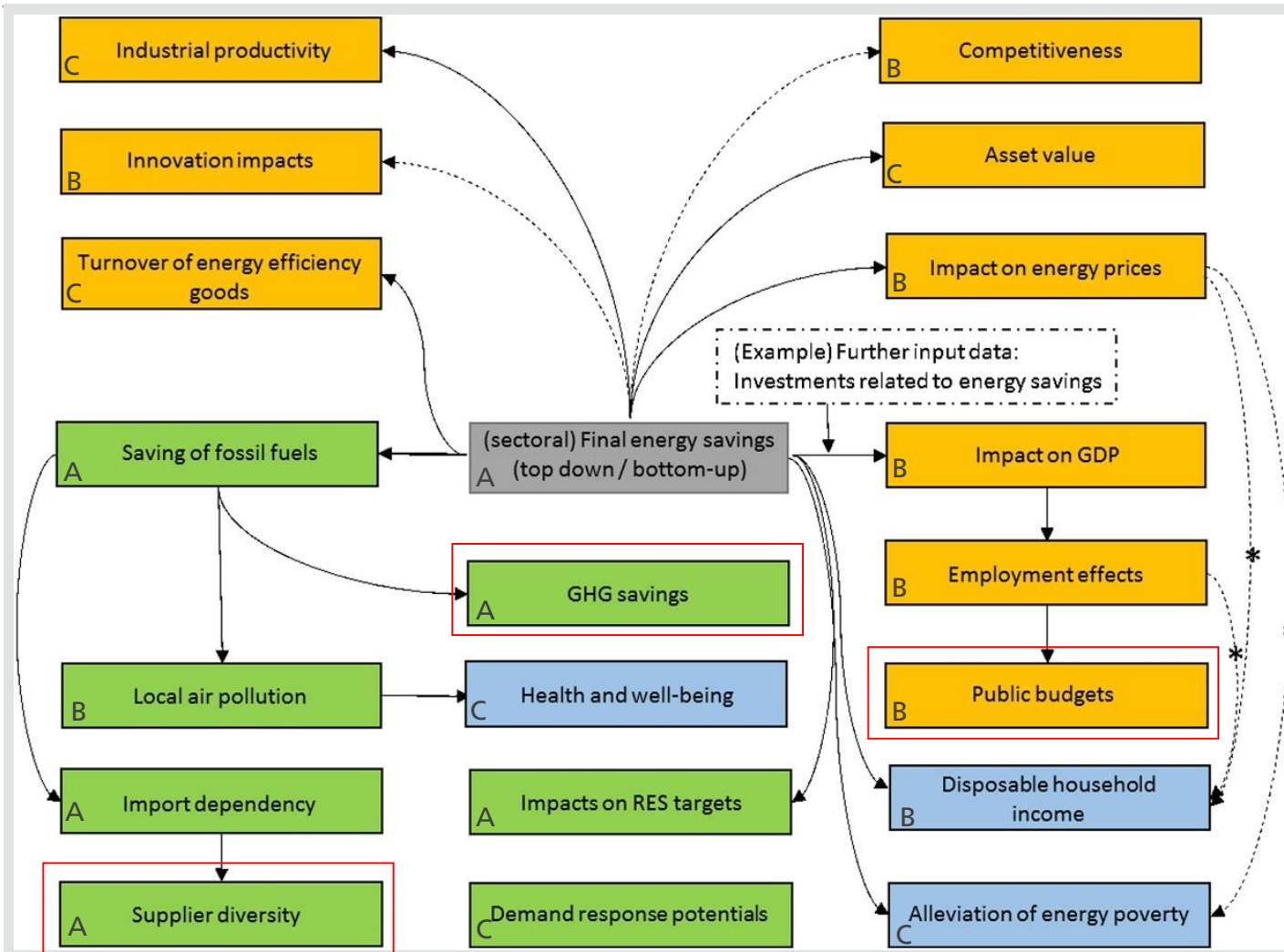
## *Overall Approach*

- Focus on the *multiple benefits / impacts* of energy efficiency (“MB:EE”)
- Developed as part of the ODYSSEE-MURE project
- Set of 20 indicators in 3 main groups (environmental, social and economic)
- Linked to both (ex-post) top-down and bottom-up savings
- Covering as many EU Member States as possible
- Indicators rated in 3 categories (A to C) based on coverage, methodology and data basis
  
- Available as an online tool



<https://www.odyssee-mure.eu/data-tools/multiple-benefits-energy-efficiency.html>

# Introduction



(A) good temporal and spatial coverage within the EU as well as a solid methodological basis  
 (B) limited spatial and temporal coverage, while still being based on a good methodological foundation.  
 (C) limited spatial and temporal coverage and methodological limitations.

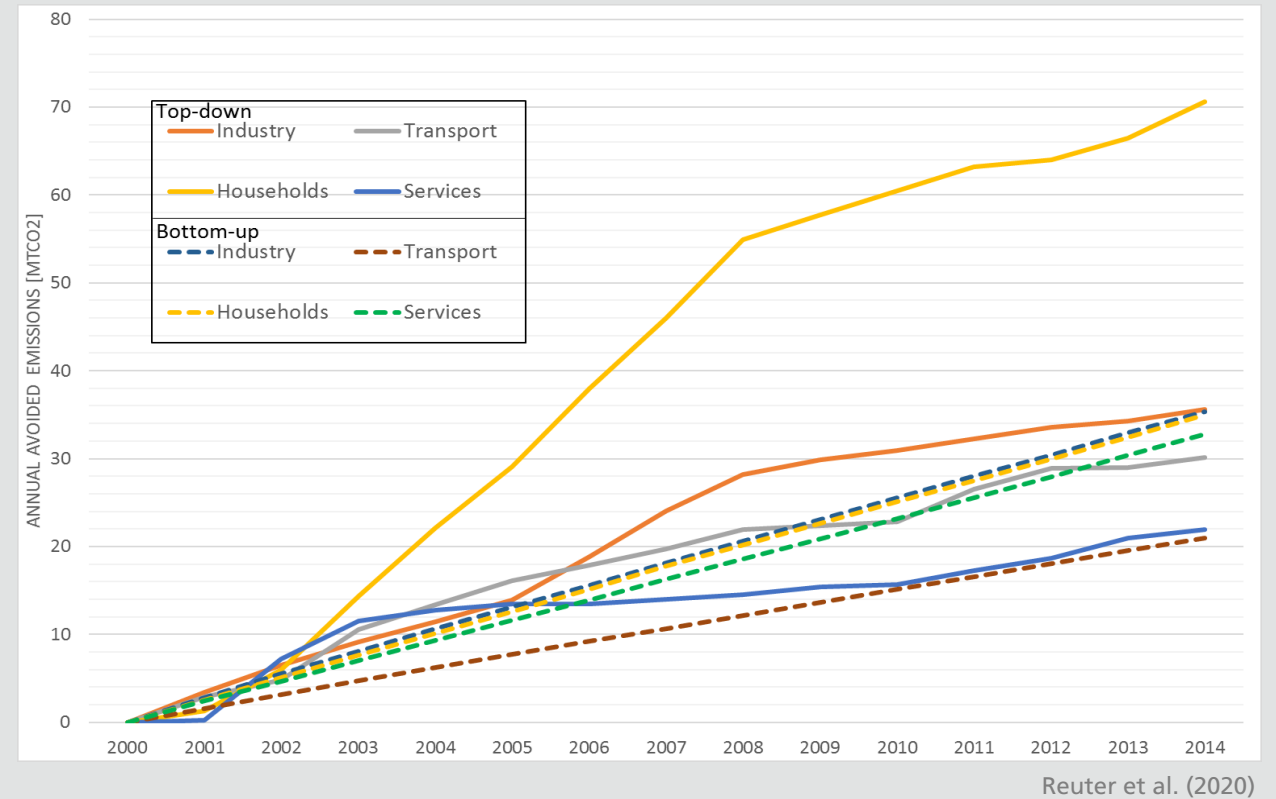
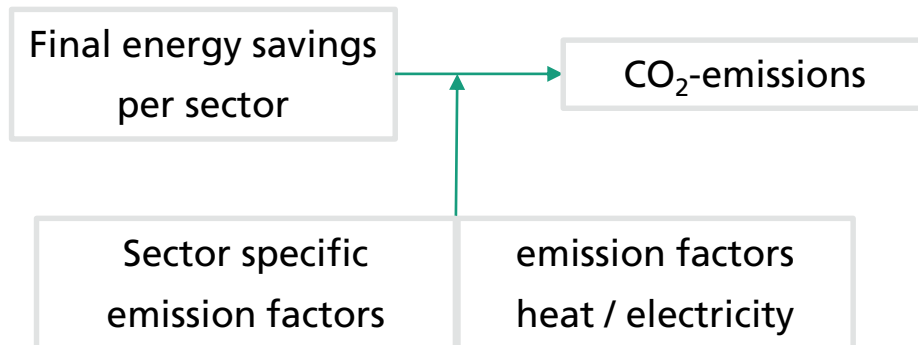
\*second order (feedback loops)

Reuter et al. (2020)

# Methodology/Results

## Example: *Environmental - GHG emissions*

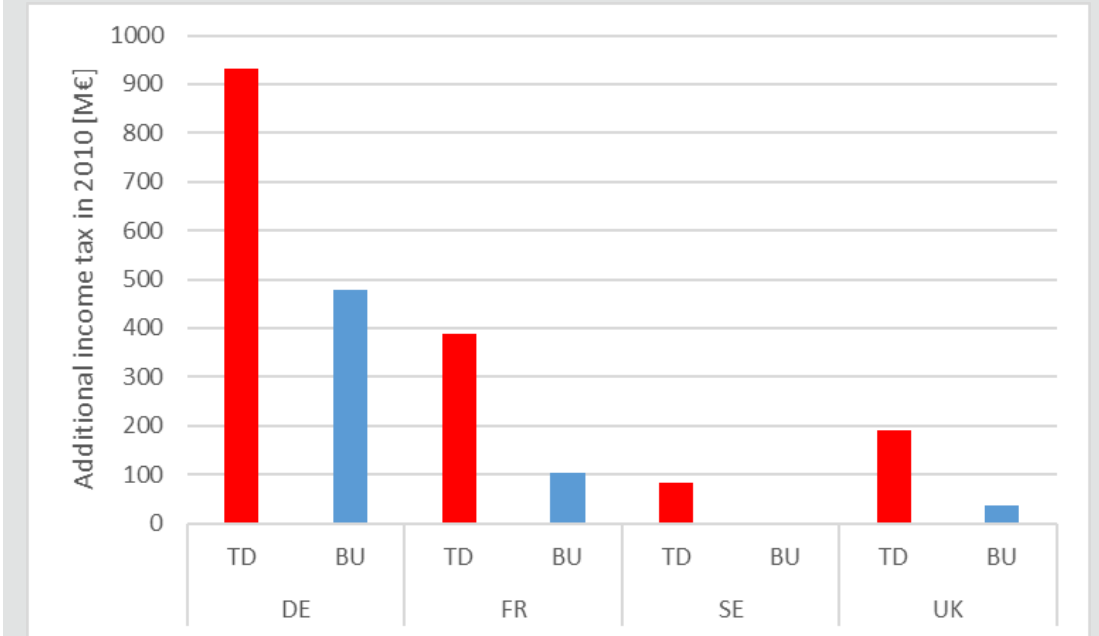
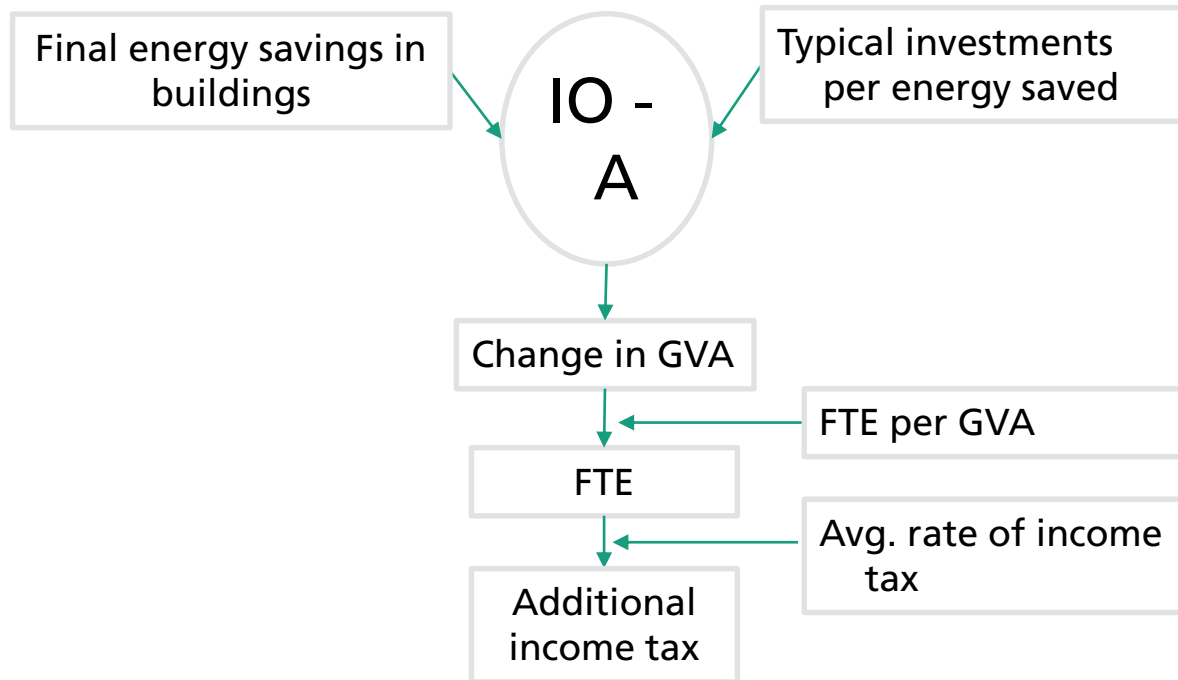
- To assess the CO<sub>2</sub> emissions linked to the energy savings achieved we apply following method:



# Methodology/Results

## Example: *Economic - Public budgets*

- To measure the impact of energy efficiency measures on public budget (only income tax) we apply following method:



Reuter et al. (2020)

# Methodology/Results

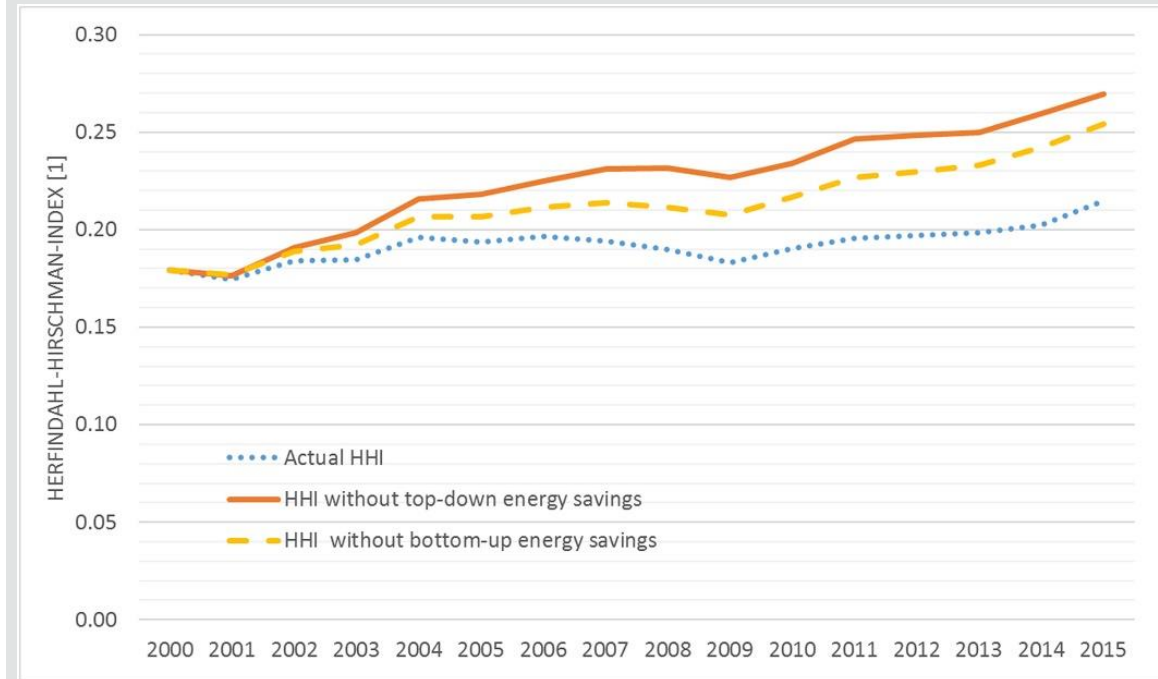
## Example: *Economic - Supplier diversity*

- To measure the degree of supplier diversity of a country we use the Herfindahl-Hirschman-Index (HHI)

$$HHI = \sum_i^4 \frac{(\sum_j (MS_{ij})^2) * I_i}{I_{tot}}$$

Where  $MS_{ij}$  represents the share of the supplying country  $j$  in the imports  $I$  of energy carrier  $i$  (solid fuels, oil, gas, electricity) of the country considered, multiplied by the imports of the respective energy carrier.

- Assuming that the energy savings (expressed in primary terms) reduce the primary energy imports from the main supplier (i.e. minimizing the share of the dominant supplier).
- The impact of EE in supplier diversity is measured with the difference between the observed HHI ("actual HHI") and a counterfactual HHI "without energy savings"



Reuter et al. (2020)

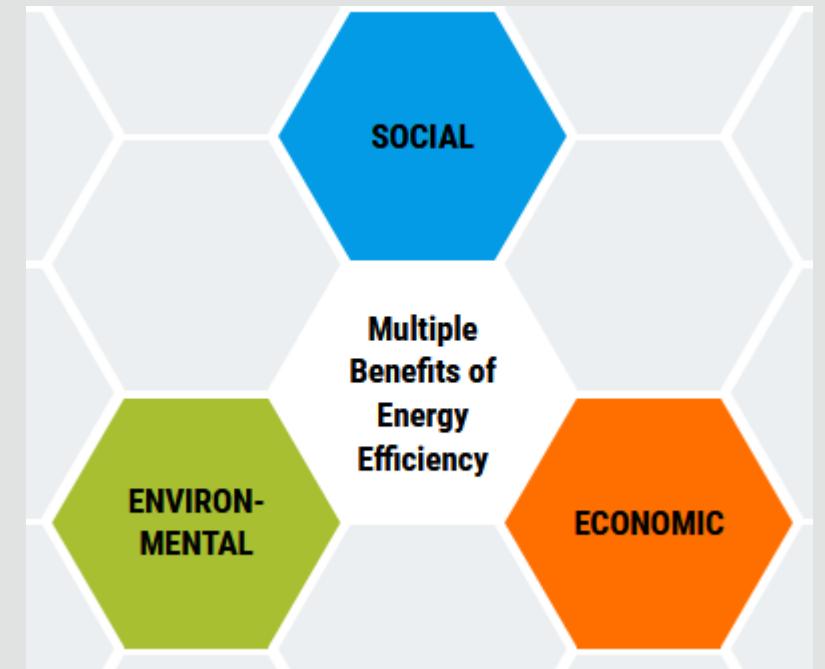
# Results

## Main results

- Strong evidence for multiple benefits of energy efficiency
- Comprehensive set of indicators covering all relevant aspects
- A good coverage of countries and indicators has been achieved

## Limitations

- A few indicators (category C) have to be further developed to close caveats in the approach in the future
  - Extending coverage to all countries
  - Direct methodological linkage to energy efficiency for a few indicators
- Limited to ex-post data
- Limited to national level



# Outlook

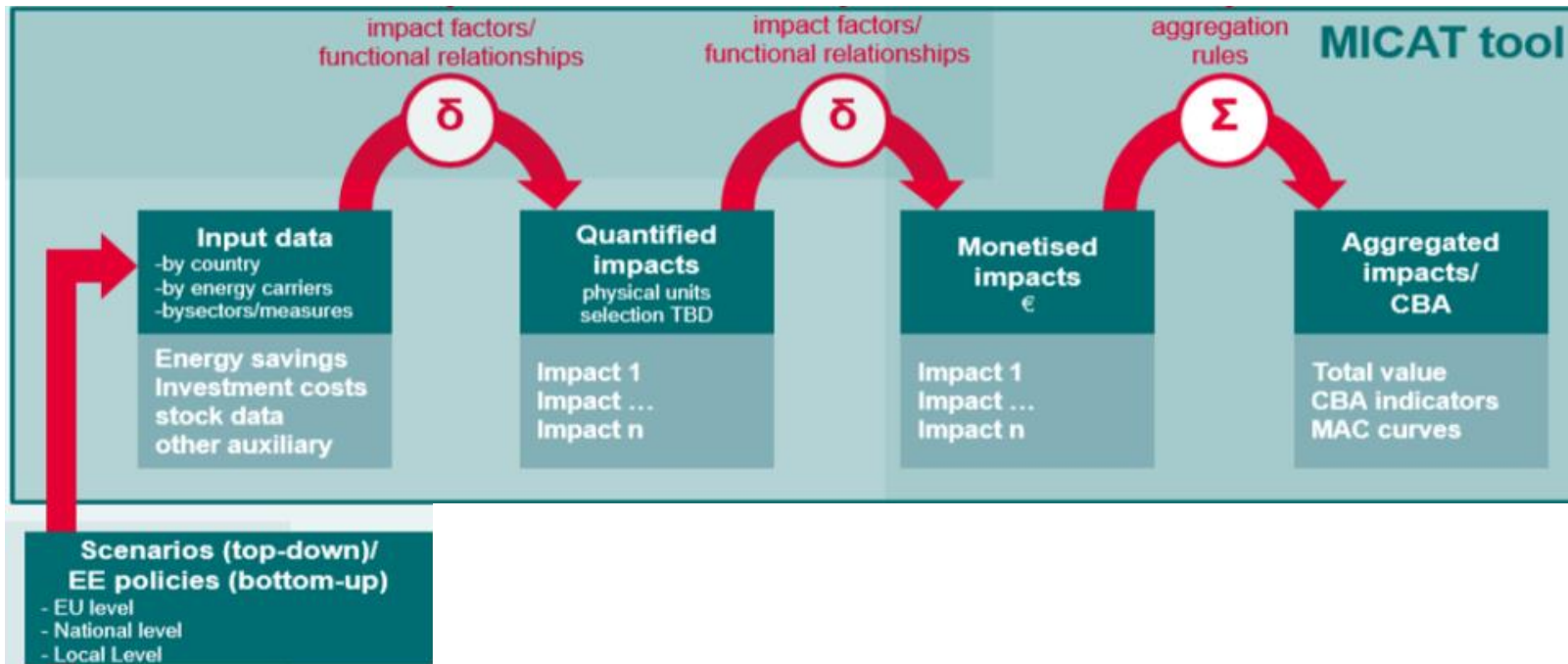
## Future work

- The findings will be refined and incorporated into a H2020 project (MICAT, <https://micat-project.eu/>)
  - Aims to establish a quasi-standard online tool for assessing multiple impacts of energy efficiency
  - ex-post, ex-ante data (for both top-down and bottom-up evaluations)
  - on different spatial levels
    - EU,
    - National,
    - Local (municipalities)



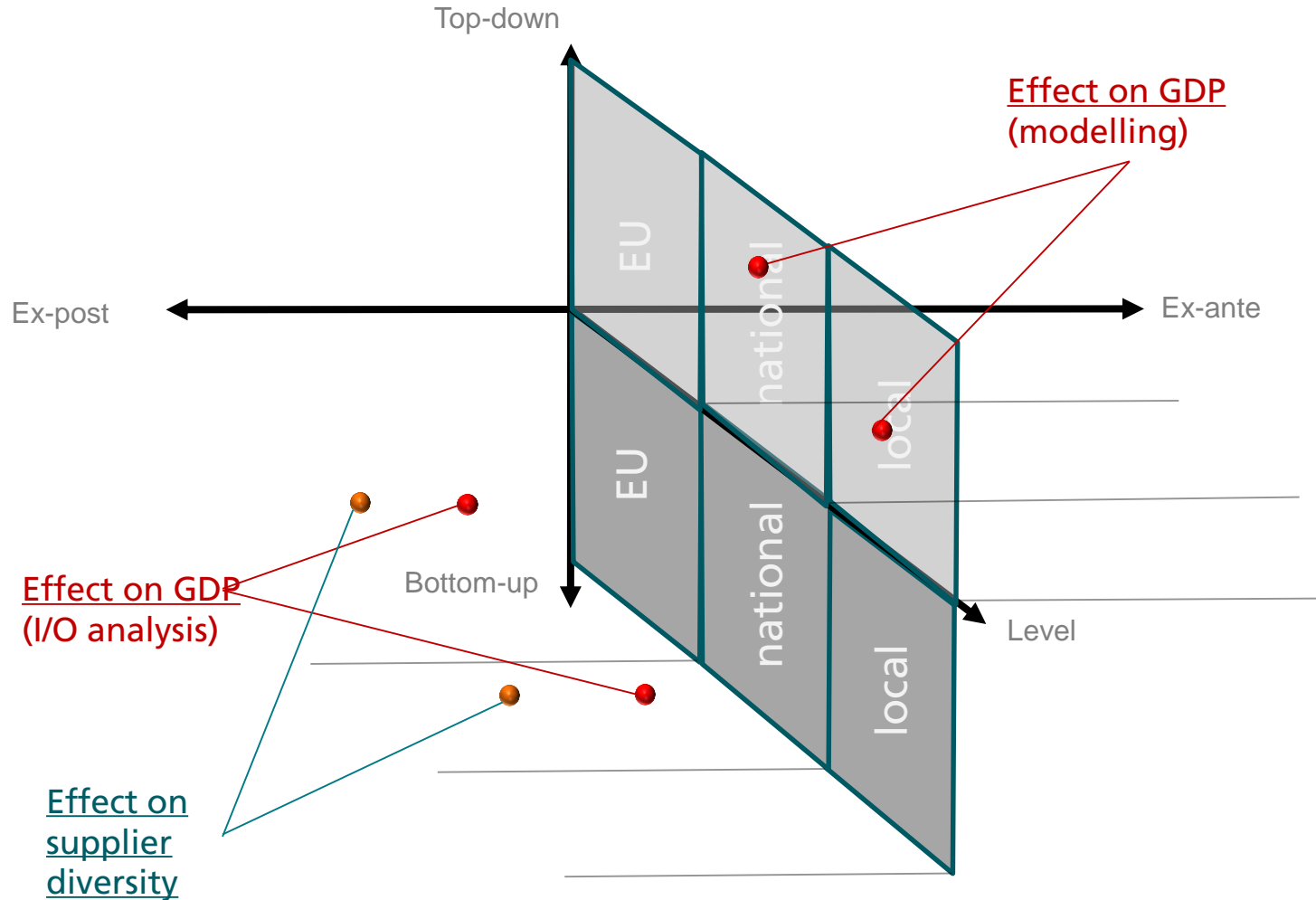


# Outlook



**MICAT**  
Multiple Impacts Calculation Tool

# Outlook



# MICAT

Multiple Impacts Calculation Tool

**Thank you very much for your  
attention!**

**Matthias Reuter**

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The logo for MICAT (Multiple Impacts Calculation Tool) features the word "MICAT" in a stylized, colorful font. The letters are composed of overlapping shapes in shades of blue, orange, and yellow.

Multiple Impacts Calculation Tool

<https://www.micat-project.eu>

The logo for ODYSSEE-MURE features the word "ODYSSEE" in blue and "MURE" in green, both in a bold, sans-serif font.

<https://www.odyssee-mure.eu>