

Beyond energy savings: The multiple benefits of energy efficiency

Modelling macro-level and sectoral impacts of energy efficiency

The multiple benefits of modelling energy efficiency in a macro-econometric model

Jon Stenning

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e3me



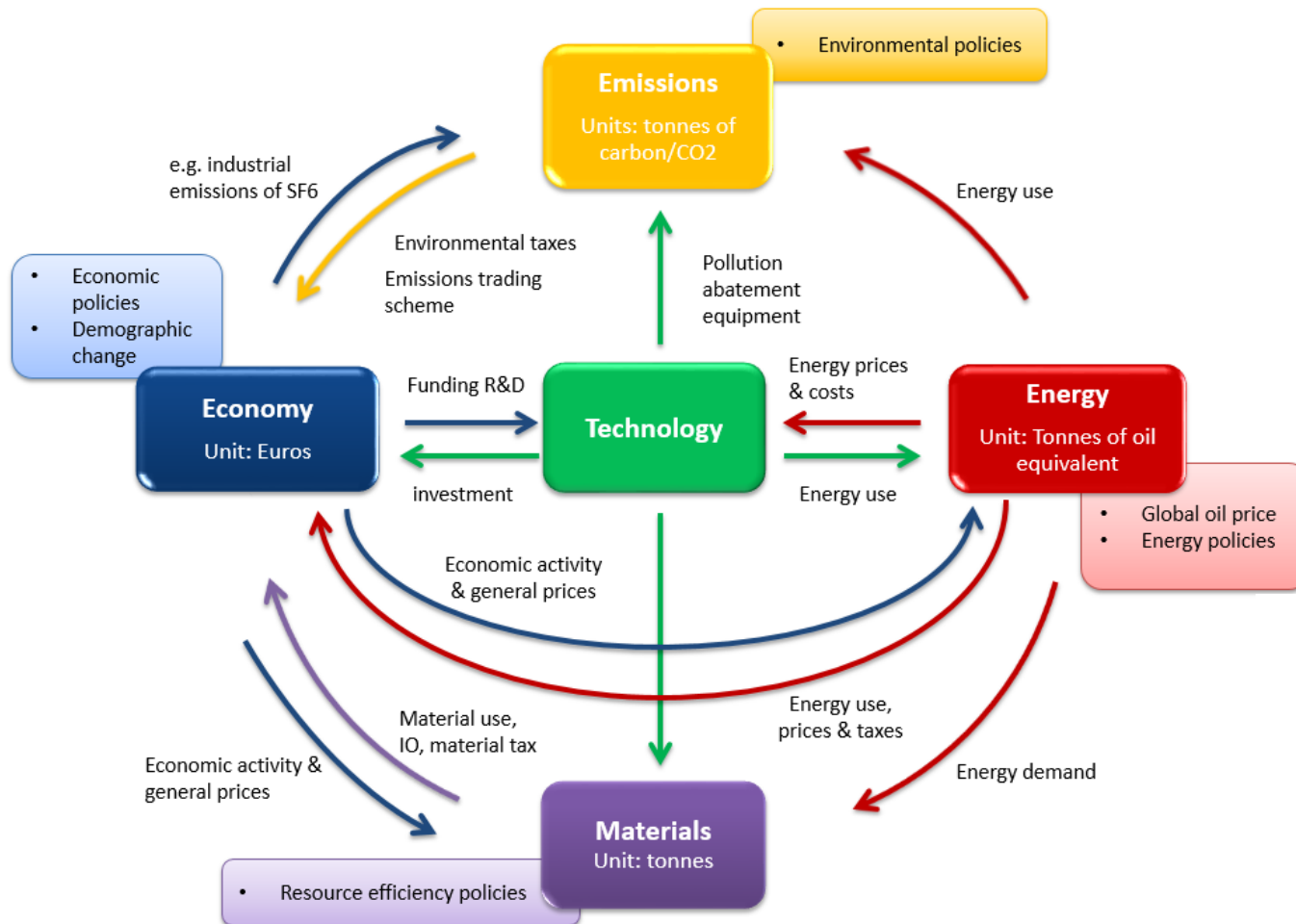
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What can macro-modelling tell you?

- A macroeconomic model can tell you:
 - supply chain effects of energy efficiency programmes
 - macro-level impacts, like GDP
 - employment effects
 - indirect rebound effects
 - interaction with other policy
- It cannot generally tell you:
 - the individual energy savings for a particular measure
 - rates of uptake for particular technologies
- A comprehensive economic analysis therefore requires a combination of bottom-up and macroeconomic modelling

The linkages in E3ME



Why E3ME is suitable for modelling energy efficiency

- Non-equilibrium model
 - no assumption of full resource use
 - ...or rationality
- Negative cost options are possible
- Investment has a positive economic impact
 - finance is available for sound investments – no crowding out
- It captures indirect rebound effects
 - is money saved on energy spent on other energy-intensive goods/services?

A number of impacts are captured...

- Both economic (by sector)...
 - GDP and value added
 - jobs
- ...and others of interest to policymakers
 - public budgets
 - air quality
 - emissions
 - health benefits

...but some are not covered

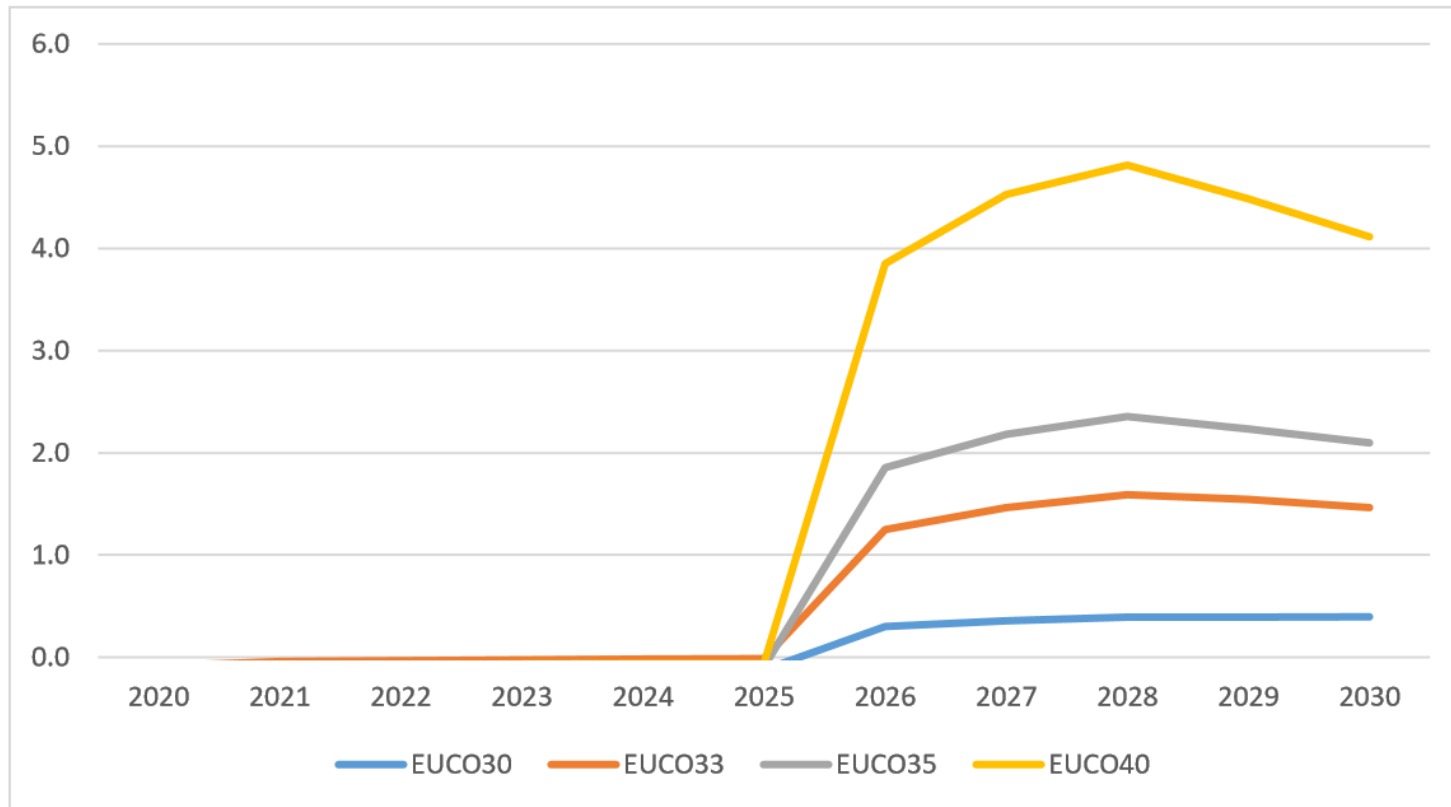
- Social benefits
 - often depend upon design/implementation of policy
 - e.g. can you successfully target hard-to-reach low income households?
- Industrial competitiveness
 - requires sectoral detail beyond the 71 in E3ME...
 - ...and detailed understanding of production choices

The macro-level and sectoral impacts of Energy Efficiency policies

- Carried out for the European Commission and published in 2017
- Used energy balances and investment costs from PRIMES,
 - plugged in to E3ME to capture indirect rebound effects
- Worked with others to cover the benefits that E3ME could not assess;
 - Wuppertal Institut assessed social impacts (as part of EPBD report)
 - EY measured industrial competitiveness and health
 - Other models also used for IA (e.g. GAINS for health impacts)

A taster... more energy efficiency is better for the European economy

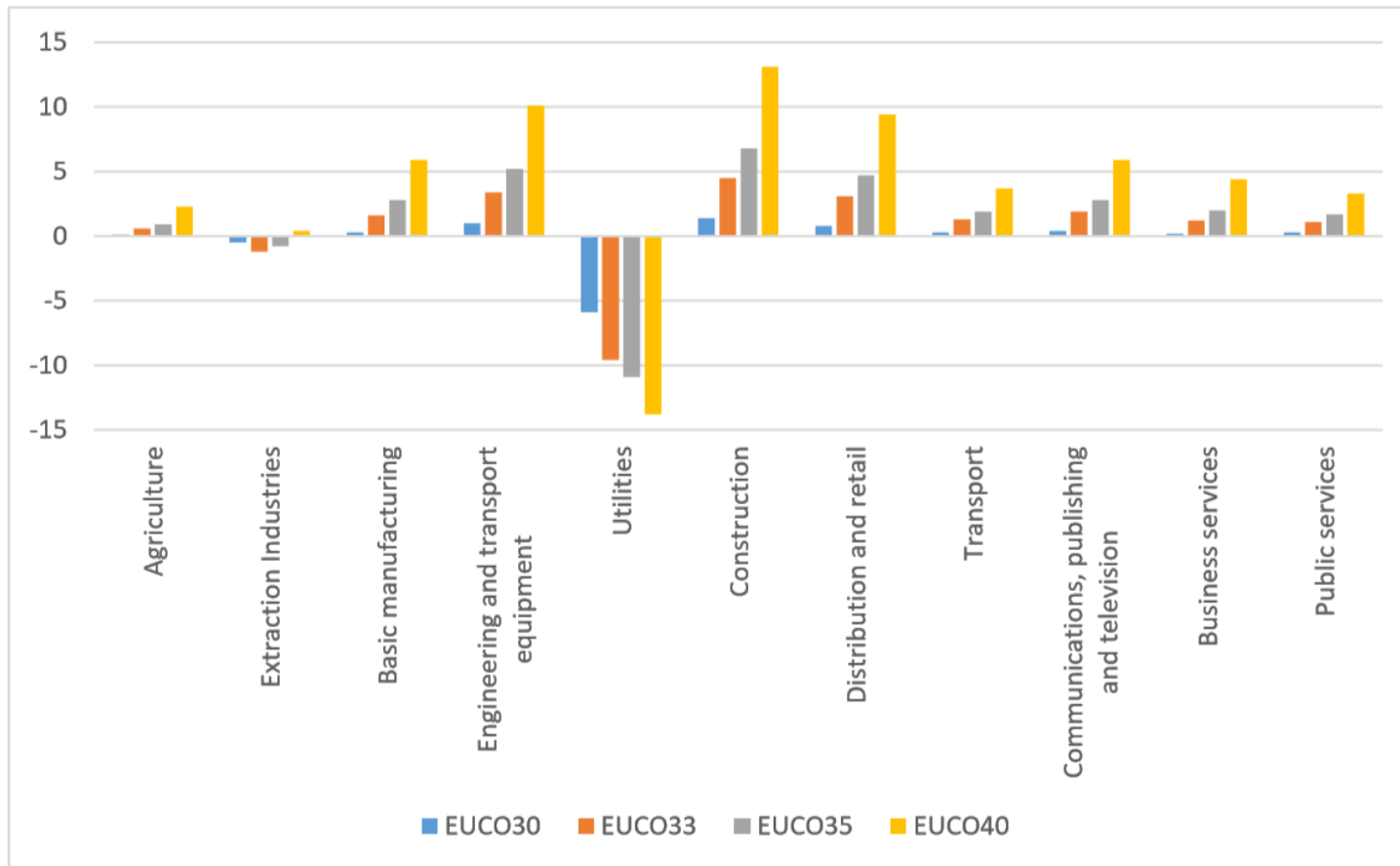
Figure IV.2 EU28 GDP, 2016-2030, % from EUCO27 scenario (no crowding out)



Source(s): E3ME, Cambridge Econometrics

The sectoral impacts are uneven

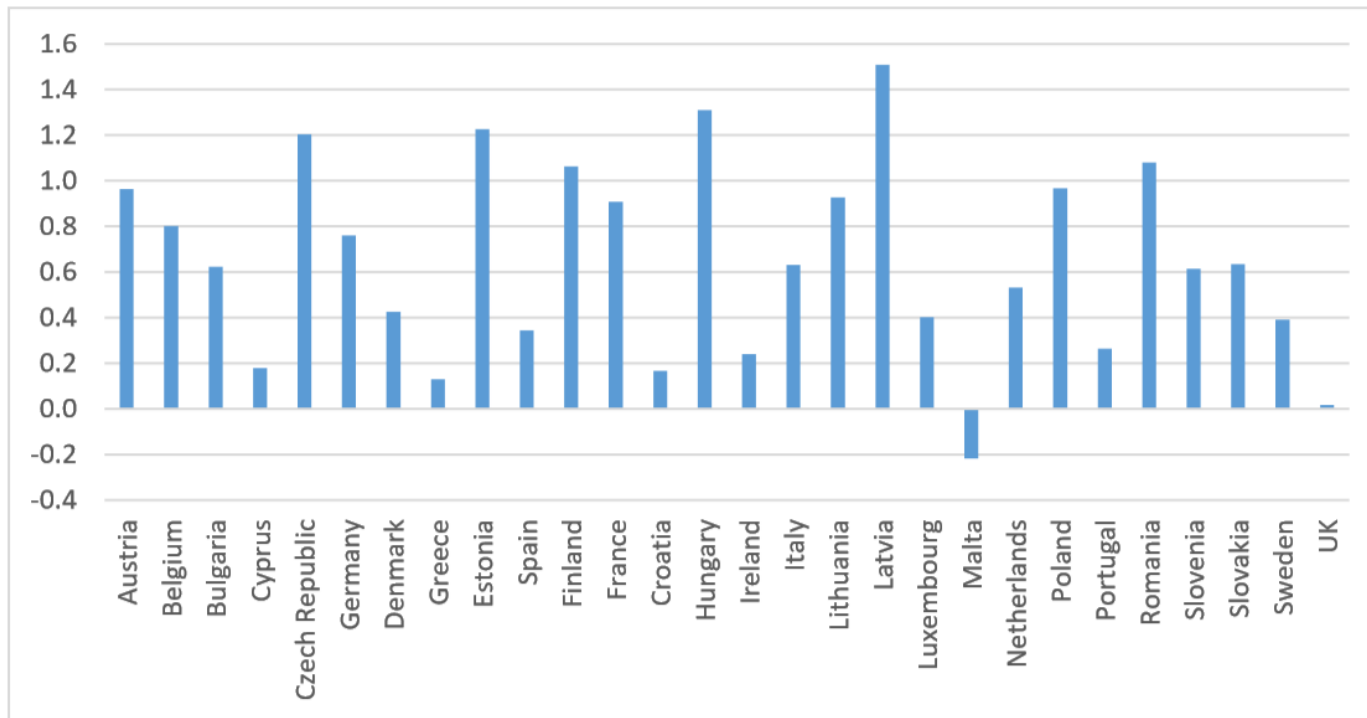
Figure IV.8 EU28 Summary of output impacts by sector in 2030, % difference from EUCO27 scenario (no crowding out)



Source(s): E3ME, Cambridge Econometrics

Changes in public budgets vary according to investment and labour impacts

Figure IV.12: Change in public **budget** balance by Member State in 2030, as a % of GDP for EUCO33 compared to EUCO27 (no crowding out)



Source(s): Cambridge Econometrics

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