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Centre for Climate and Energy Analyses

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THE USE OF AN INTEGRATED MODELLING APPROACH (CGE, SECTORAL) TO SUPPORT DEVELOPING LONG-TERM CLIMATE STRATEGIES UP TO 2050

LIFE Climate CAKE PL

LIFE VIIEW 2050

EU Conference on Modelling for Policy support

Multidisciplinary approaches, integrated assessment and model linkages

November 25, 2021

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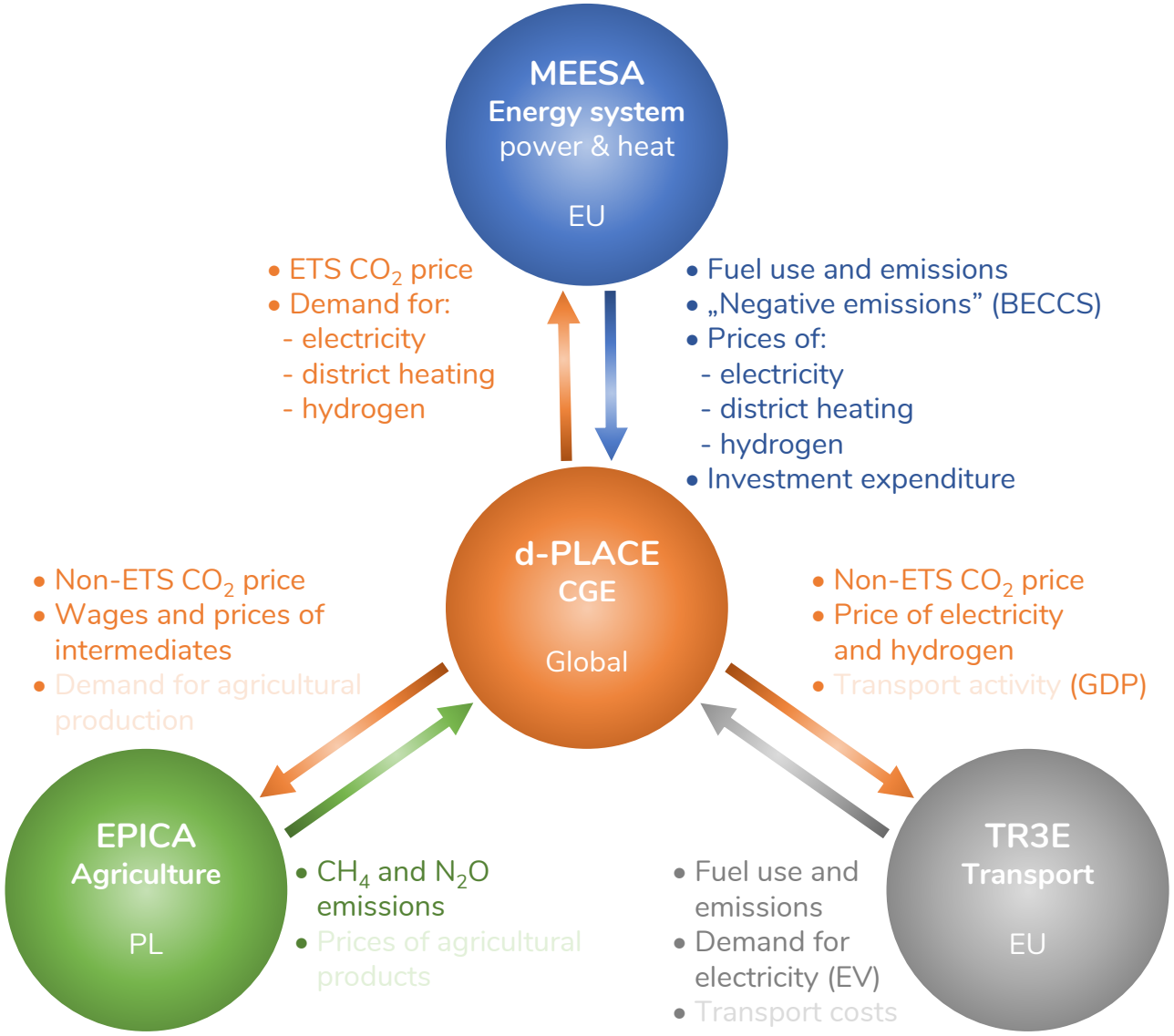
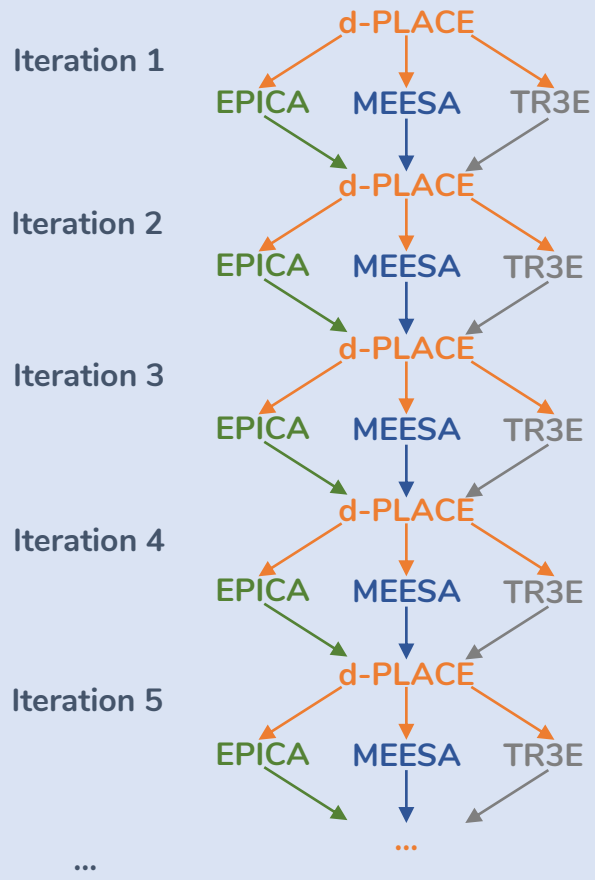
Project LIFE16 GIC/PL/000031 is co-financed from EU funds from the LIFE program and from the funds of the National Fund for Environmental Protection and Water Management.

CAKE MODELS LINKING



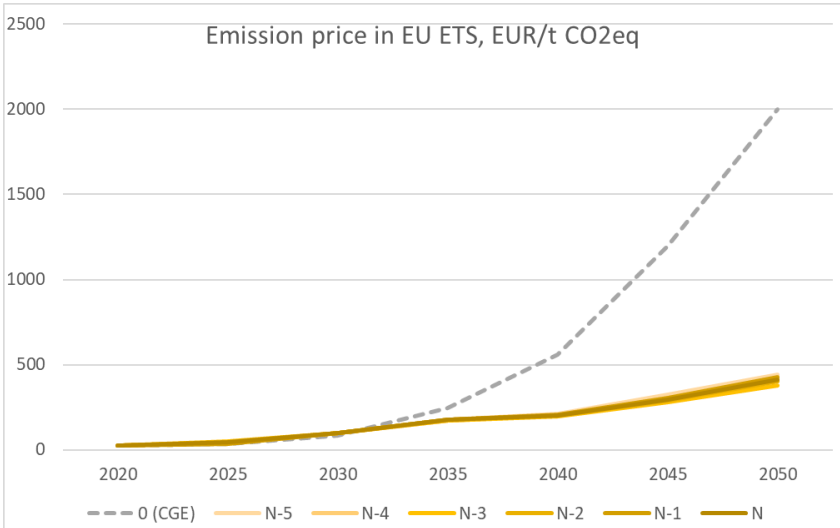


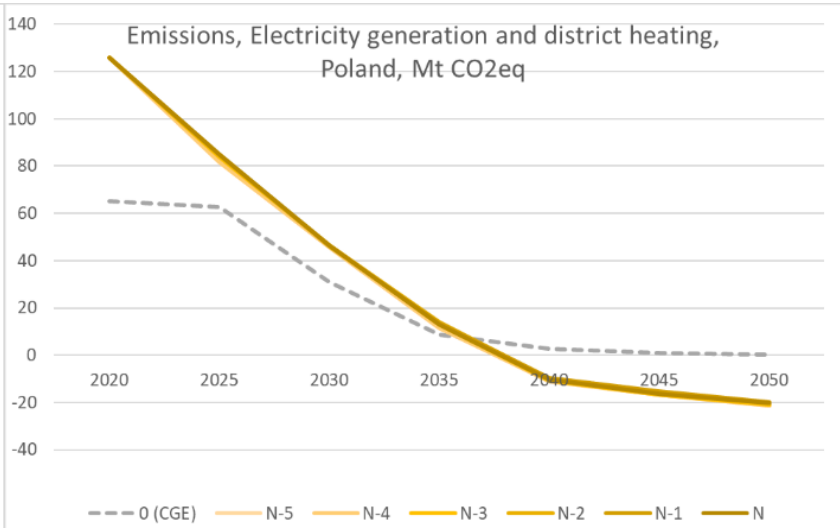
THE SCENARIO AND EMISSION REDUCTION OPTIONS

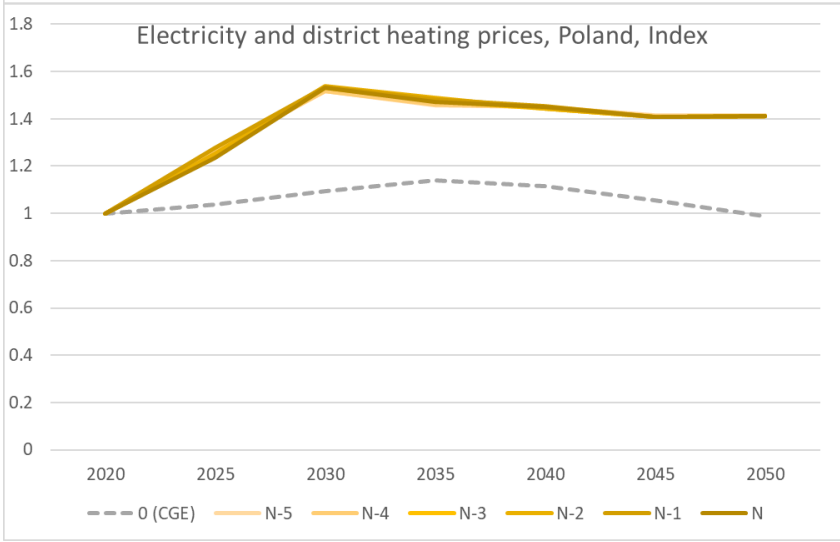
Neutrality scenario (NEU)
- 2030: emission reduction **53%** (net 55%) vs. 1990,
- 2050: emission reduction **90%** (net 100%) vs. 1990.

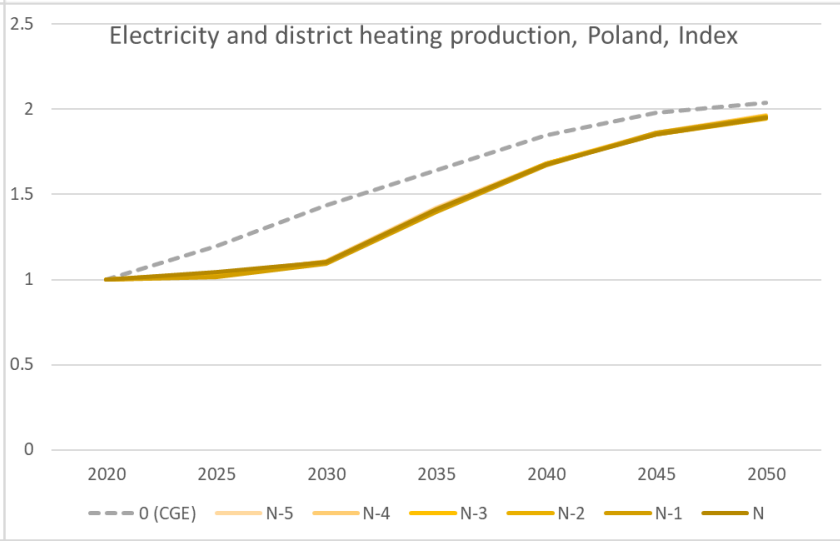
- Emission **reduction mechanisms** included in the models:
  - change in the structure of electricity and heat generation (**MEESA**),
  - change in the structure of the transport fleet (**TR3E**),
  - change in the structure of agricultural production (**EPICA**),
  - improving energy efficiency, changing the energy mix (electrification, hydrogen), CCS/CCU (industry, waste), changing the production structure in the economy (**d-PLACE**).
- **Marginal abatement cost from combined models**:
  - separately for EU ETS and non-ETS.

SELECTED RESULTS: ETS, ENERGY SECTOR







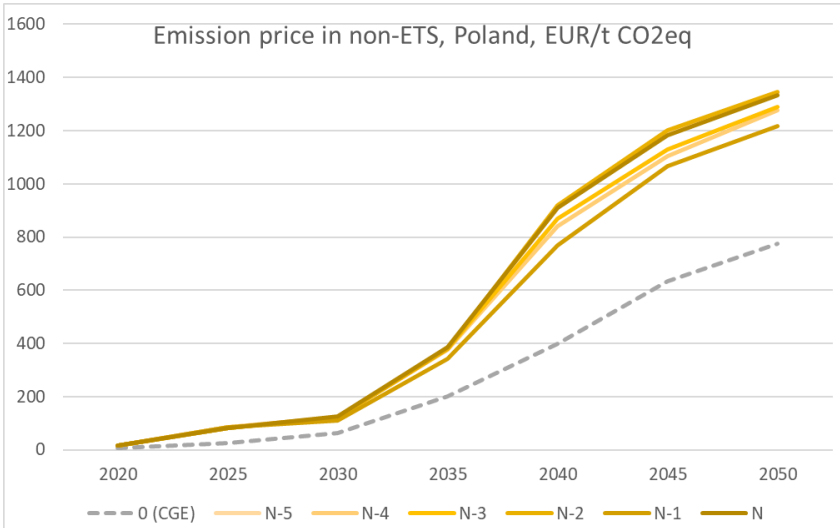


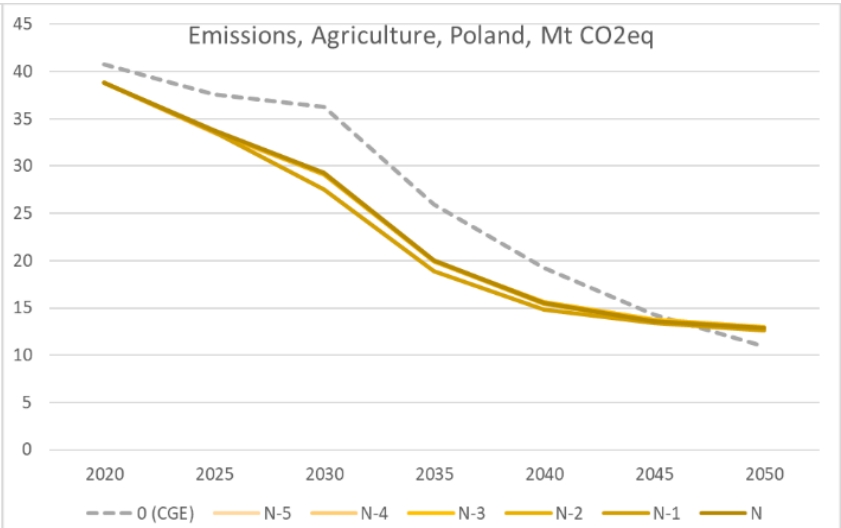
- Stand-alone CGE results revised in linked setting.
- Final paths fairly stable.
- Negative emissions from BECCS.

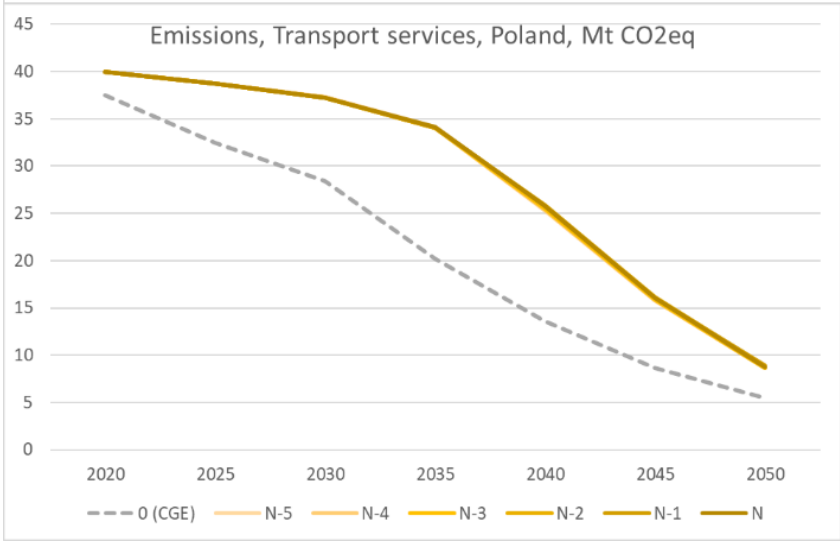
General notes:

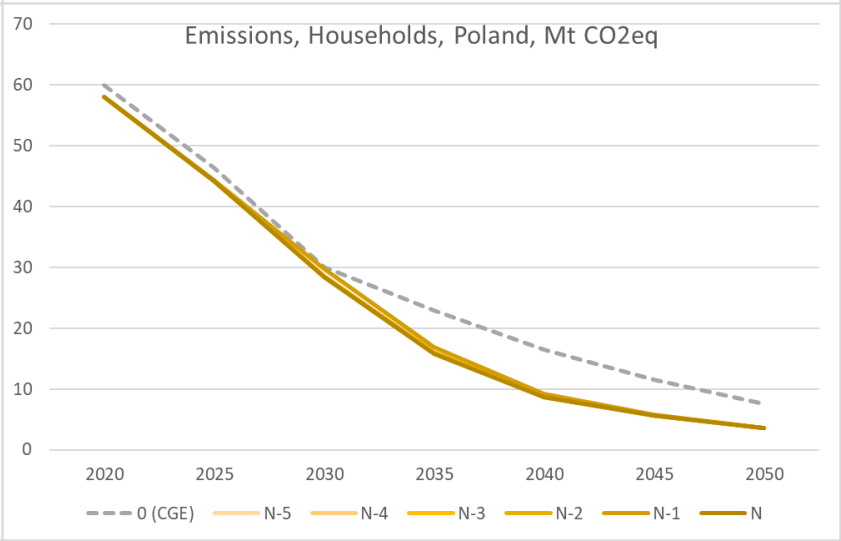
- oscillations between roughly two states,
- strict convergence may be infeasible as MEESA LP results non-continuous,
- weighting of current and previous iterations helps.

Selected results: non-ETS, Poland









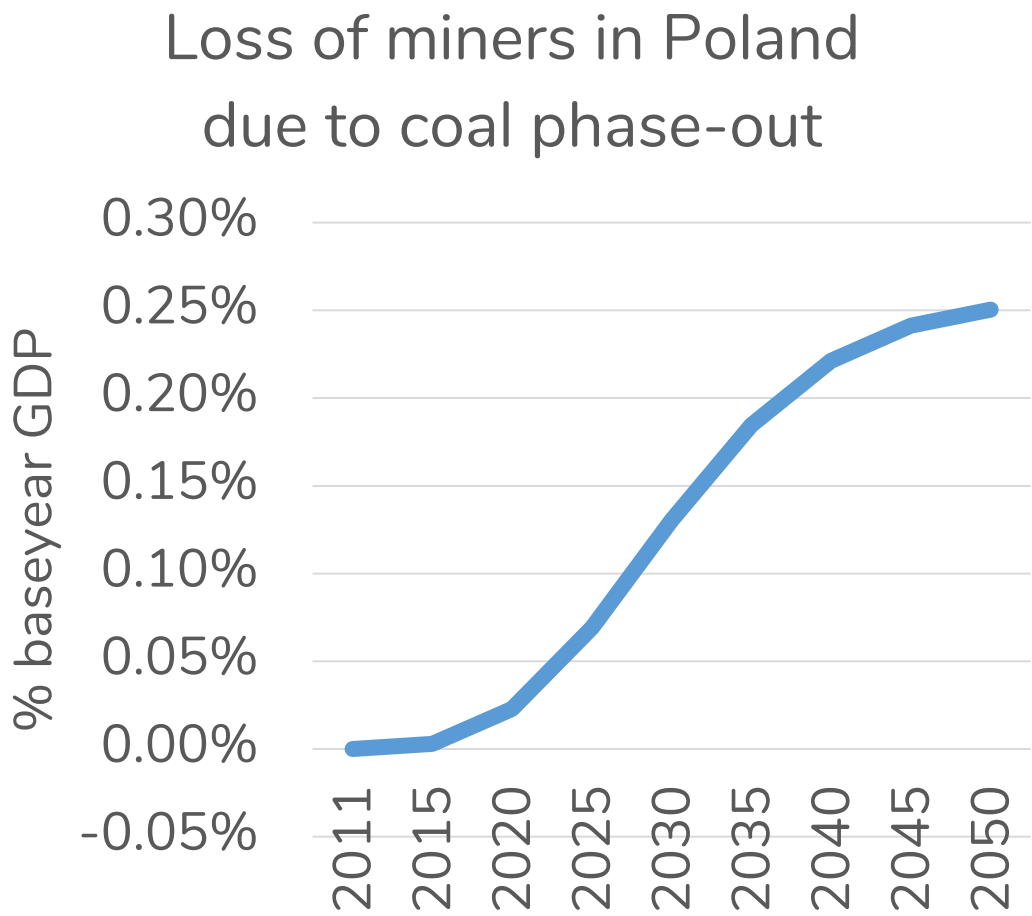
- High sensitivity of emission prices to even small changes in emission intensity of energy, transport and agricultural production.
- Imprecision of assessment of marginal abatement cost should thus be acknowledged when interpreting simulation results.

Why transition is costly?

- Given education, experience and education of miners, mining sector gives them the highest payoff from all sectors in the economy.
- Loosing a job implies that they need to move to their second-best choice
- If they move to, say, manufacturing, on average they are less productive than those who worked in manufacturing before

CGE Model projections

- **Reference scenario:** 80% GHG reduction in Europe by 2050
- Most of coal sector phased-out by late 2030s
- Cost of transition for workers gradually increases and reaches 0.25% in 2040s



Source: d-PLACE model results

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Thank you!

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