



WiseEuropa

LOW-EMISSION POLAND 2050

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About WiseEuropa

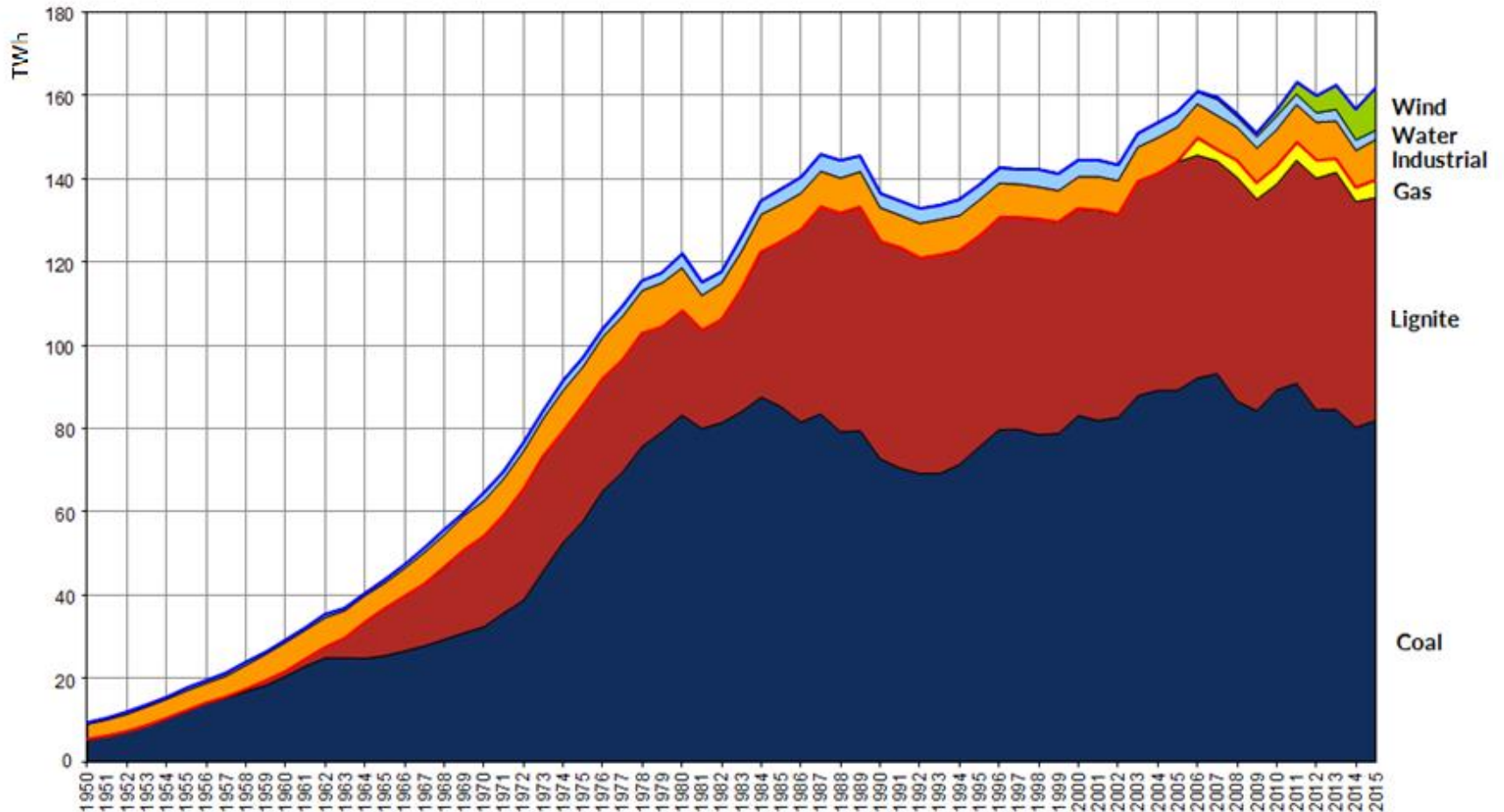
- Independent, Warsaw-based think tank focusing on economic and foreign policy
- March 2016 – experts from demosEuropa join WISE Institute to create WiseEuropa
- Research areas:
 - Public Policy and Governance
 - Economics and Economic Policy
 - Foreign Policy and International Affairs
 - Digital Economy and Technology
 - **Energy, Climate and Environment**
- **Low-Emission Poland 2050** – joint project of WISE Institute and Institute for Sustainable Development, main report published in 2013

Low Emission Poland 2050 - key goals

- ✓ Preparing complex report on **viability, costs and benefits** of an **ambitious climate policy** in Poland
- ✓ Shifting public debate and public policy agenda to strategic thinking in terms of **modernization** based on **innovation, efficiency and environmental sustainability**
- ✓ Presenting arguments in favor of the climate policy as a part of the wider modernization agenda to build **innovative and competitive low-carbon economy** in Poland



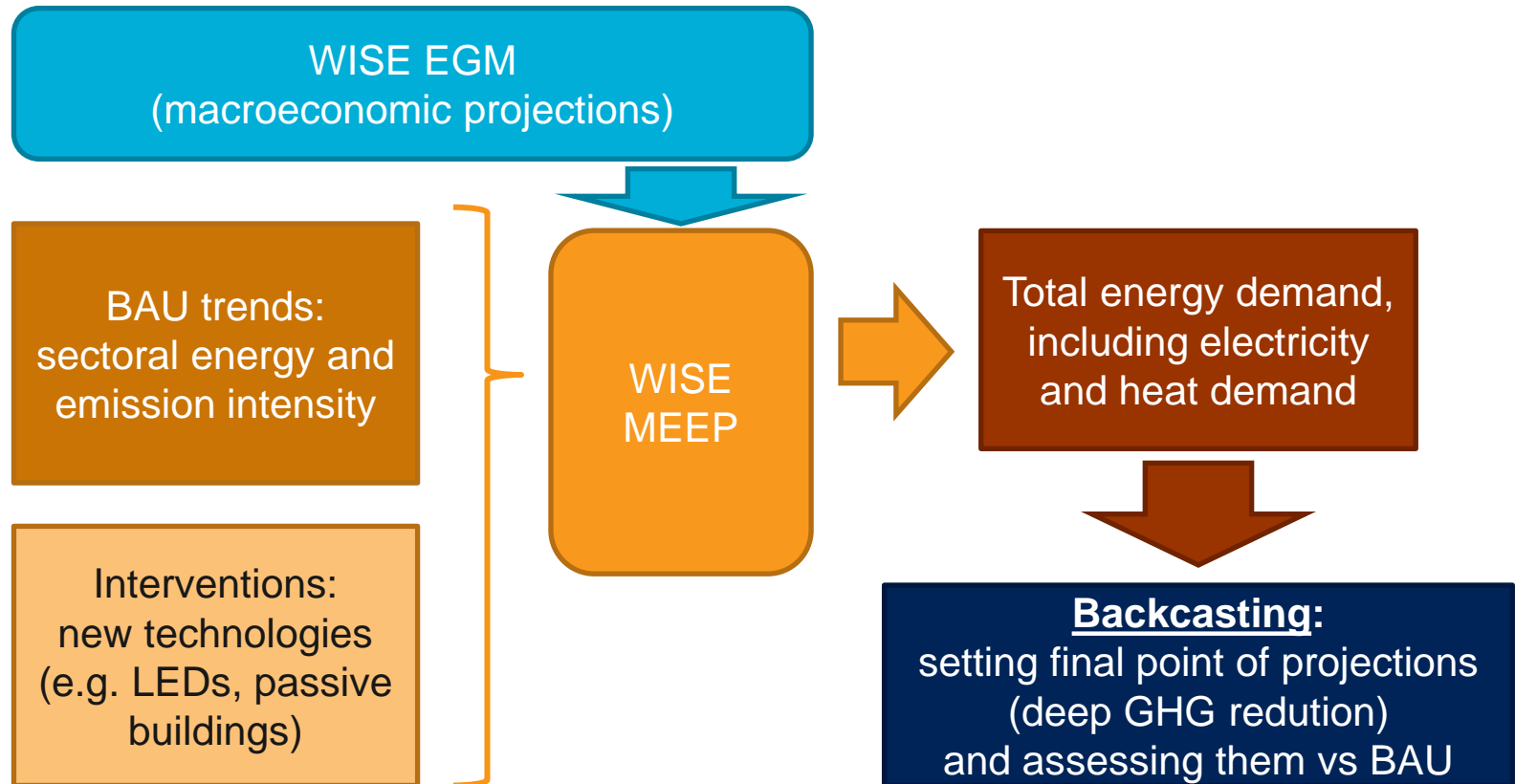
Electricity production in Poland 1950-2015



Polish energy dilemmas

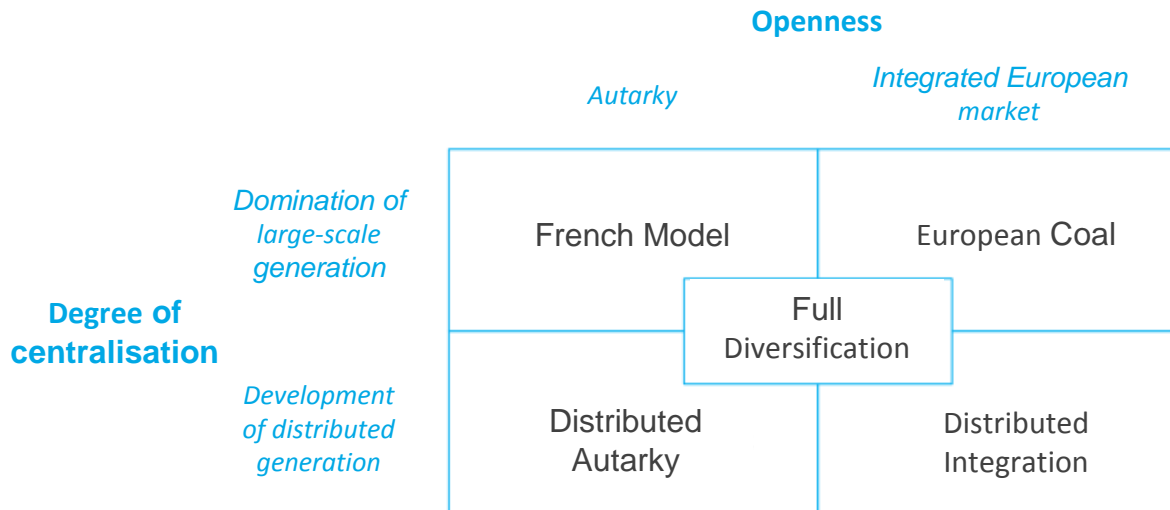
- Politically strong energy sector and mining lobby are **slowing down** the development of RES and energy efficiency.
- Investment uncertainty in energy sector + new environmental norms (non-GHG) for old plants → **security of energy supply at risk (e.g. August 2015)**
- The role of the coal mining is in **decline**. Difficult perspective for lignite, deep crisis of Polish hard coal mines
- Nuclear energy programme – **policy declarations vs no real progress**

Modelling approach – energy sector backcasting



- **WISE MEEP** (Microfoundations-based Energy and Emissions Projection model) is a national-scale model of energy use and GHG emissions in Poland. It provides sectoral-level projections based on both macroeconomic trends and bottom-up technological shifts.

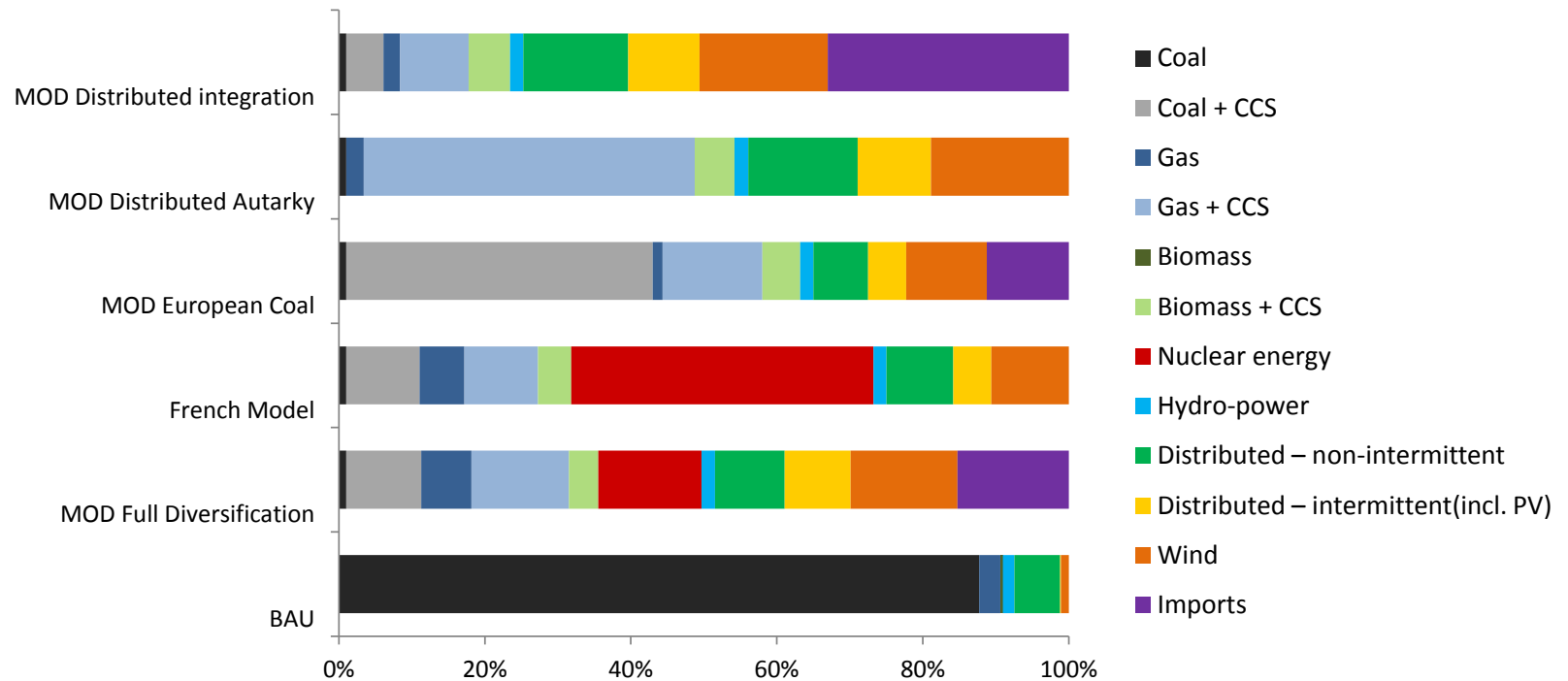
Alternative pathways for the Polish energy sector



- Reference scenario – business as usual (BAU), old coal plants replaced by new ones
- Similar dynamics for all paths – **gradual phase-out** of the existing coal plants, gas as the **bridging technology**
- Key differences not only in technologies but also in the **centralisation** and **openness**

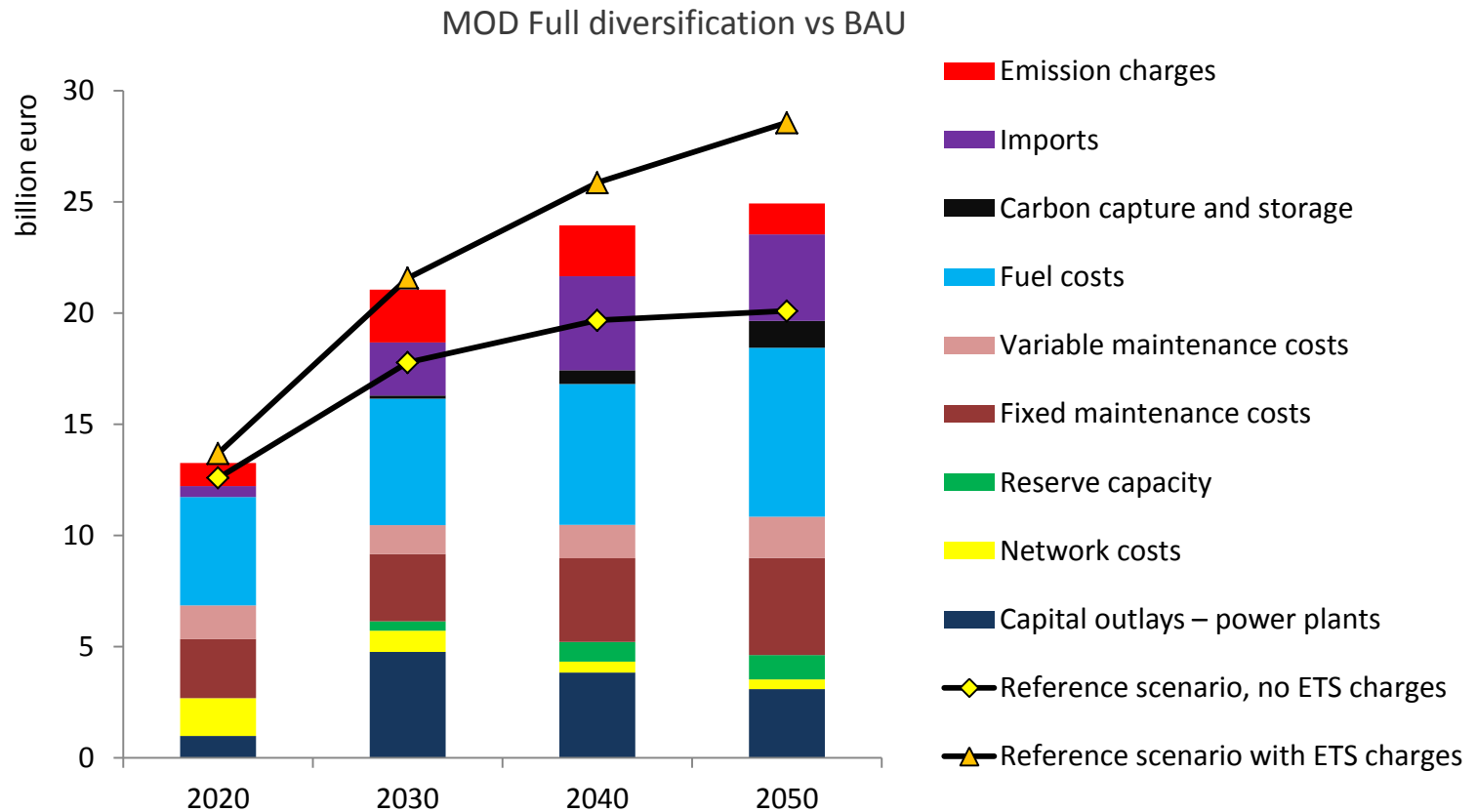
Alternative pathways for the Polish energy sector

Electricity generation mix in Poland 2050 by scenario



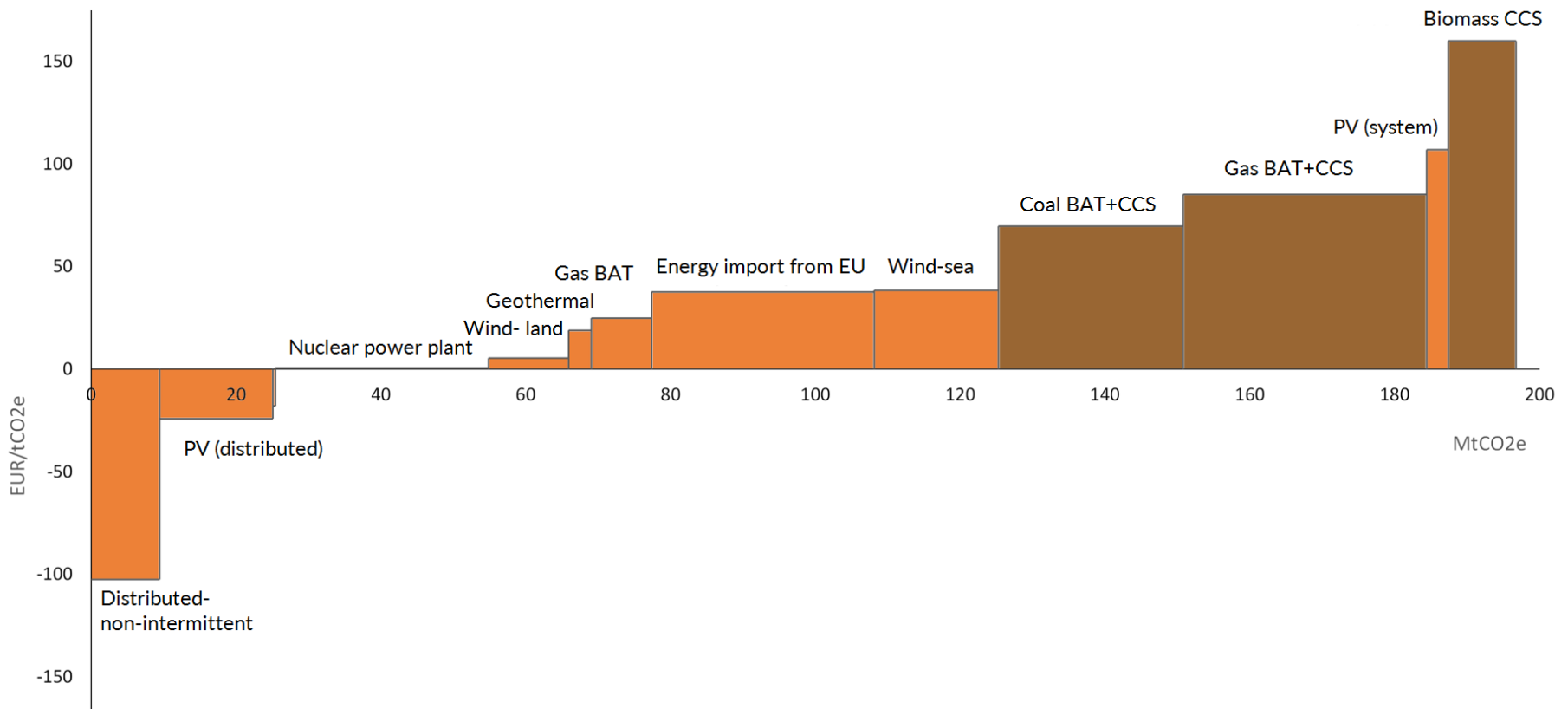
All mixes except BAU provide approx. 90% GHG reduction in 2050

Comparing scenarios: system-level costs



- EU ETS prices: 45 euro in 2050 → some scenarios cost less than BAU after 2030.
- For scenarios based on CCS coal/gas this price does not fully cover costs of CO₂ capture

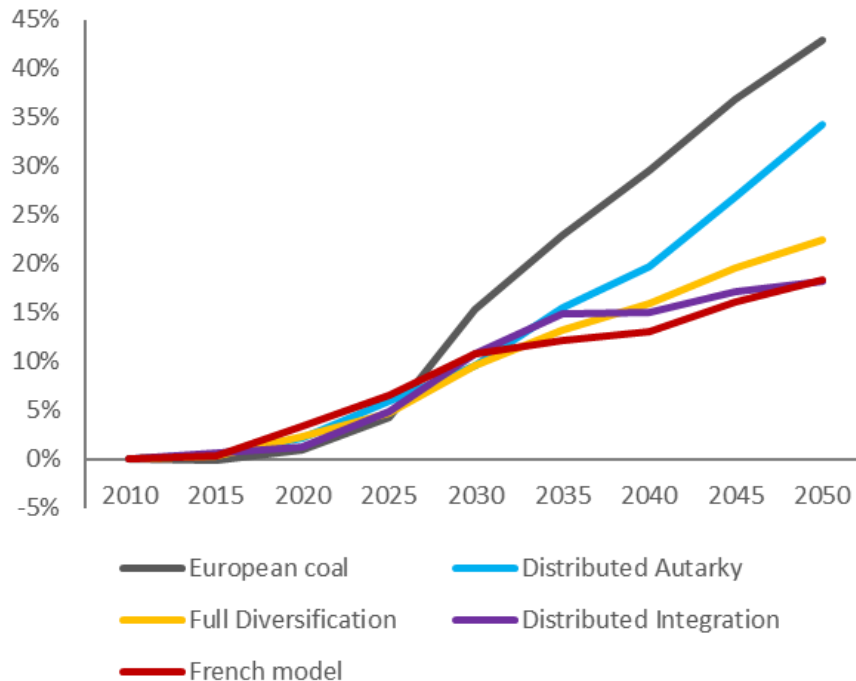
How much does it cost to reduce GHG emissions? MAC curve for energy production in Poland, 2050



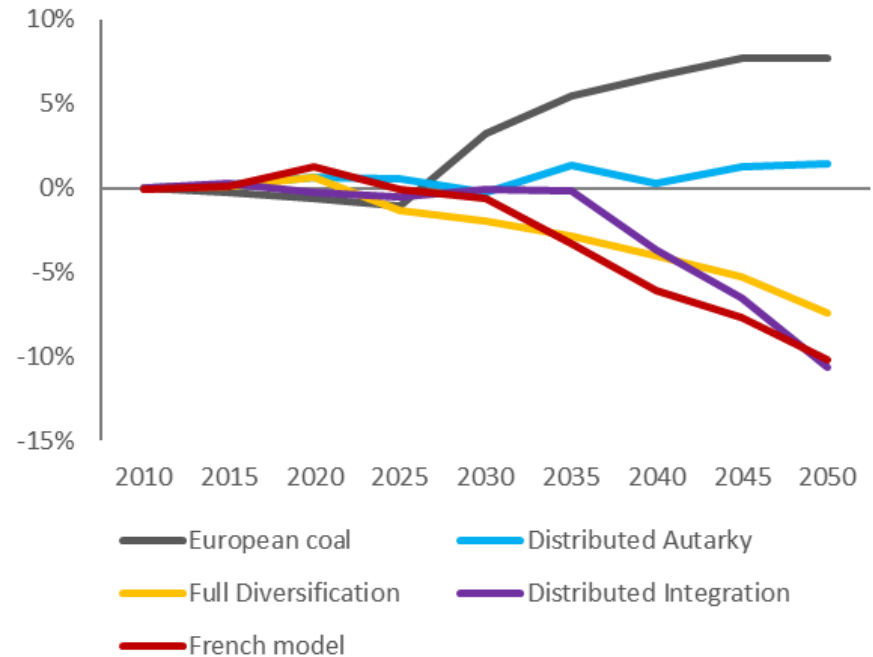
➤ Baseline – unabated coal, without EU ETS costs

Electricity price impacts

Difference vs BAU – no ETS



Difference vs BAU – with ETS



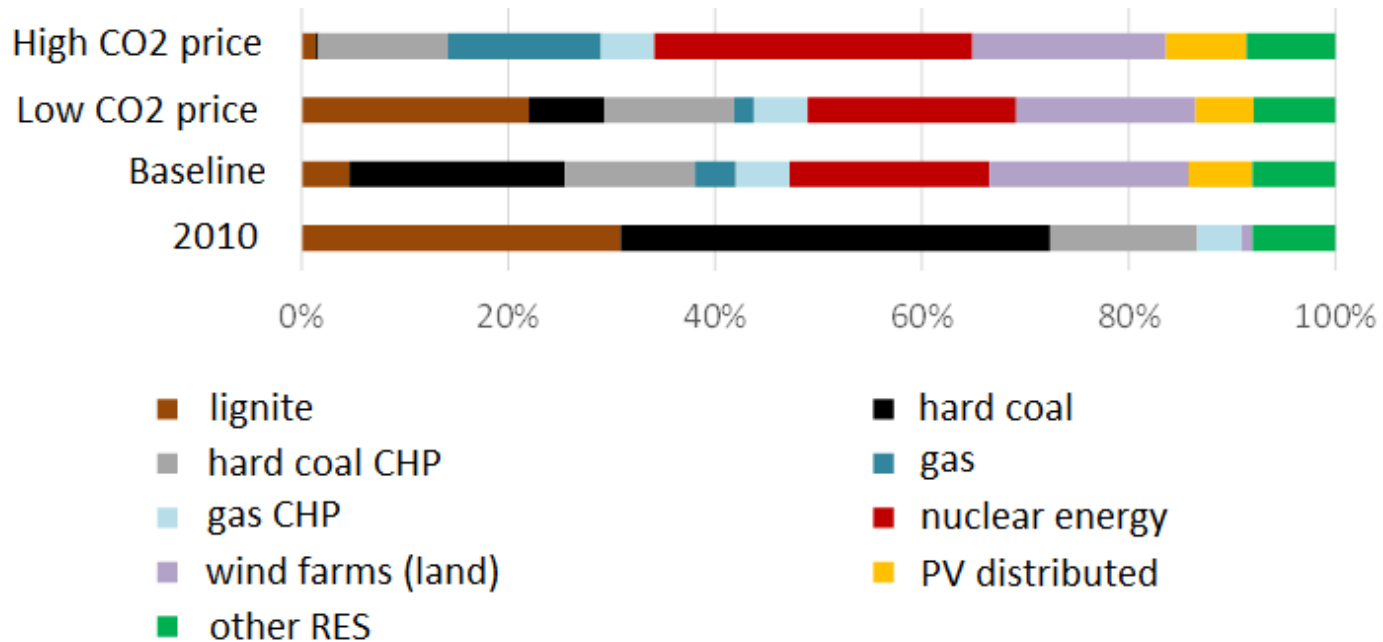
- Modest EU ETS price increase (up to 45 EUR/t) makes RES- and nuclear-based scenarios competitive
- Note: no costly delays assumed for nuclear power plants

Modelling approach – beyond Low-Emission Poland 2050



- **WISE POESSIA** - new module developed in 2013/2014. Detailed representation of electricity production in Poland, taking into account heating sector (CHP).
- Moving **from backcasting to forecasting**

Example of WISE POESSIA results Polish energy mix 2050 projection



Projection assuming that [current domestic policies will be realized](#).

Three options for the CO2 allowances prices in 2050:

approx. 25 EUR (low), 50 EUR (baseline), 80 EUR (high)

Final remarks

- Backcasting vs forecasting approach – strategic reflection or policy assessments?
- Limits to simple cost optimization – sensitivity analysis and backcasting may reveal “sub-optimal”, but more robust options
- Long-term analysis vs short-term surprises: oil price drop, PV and EV cost reduction, energy storage, nuclear projects setbacks...



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Thank you for your attention

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