World Bank

Transition to a Low-Carbon Economy in Poland

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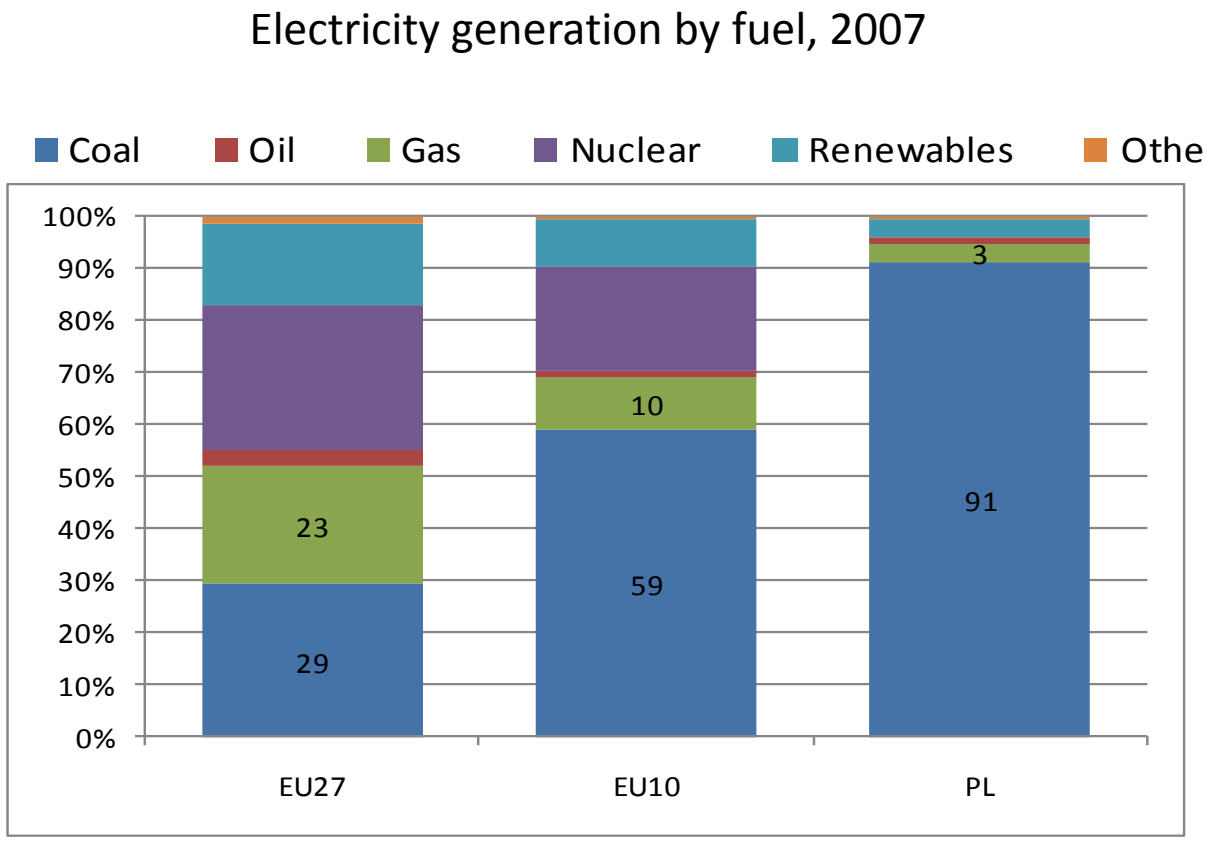
Warsaw

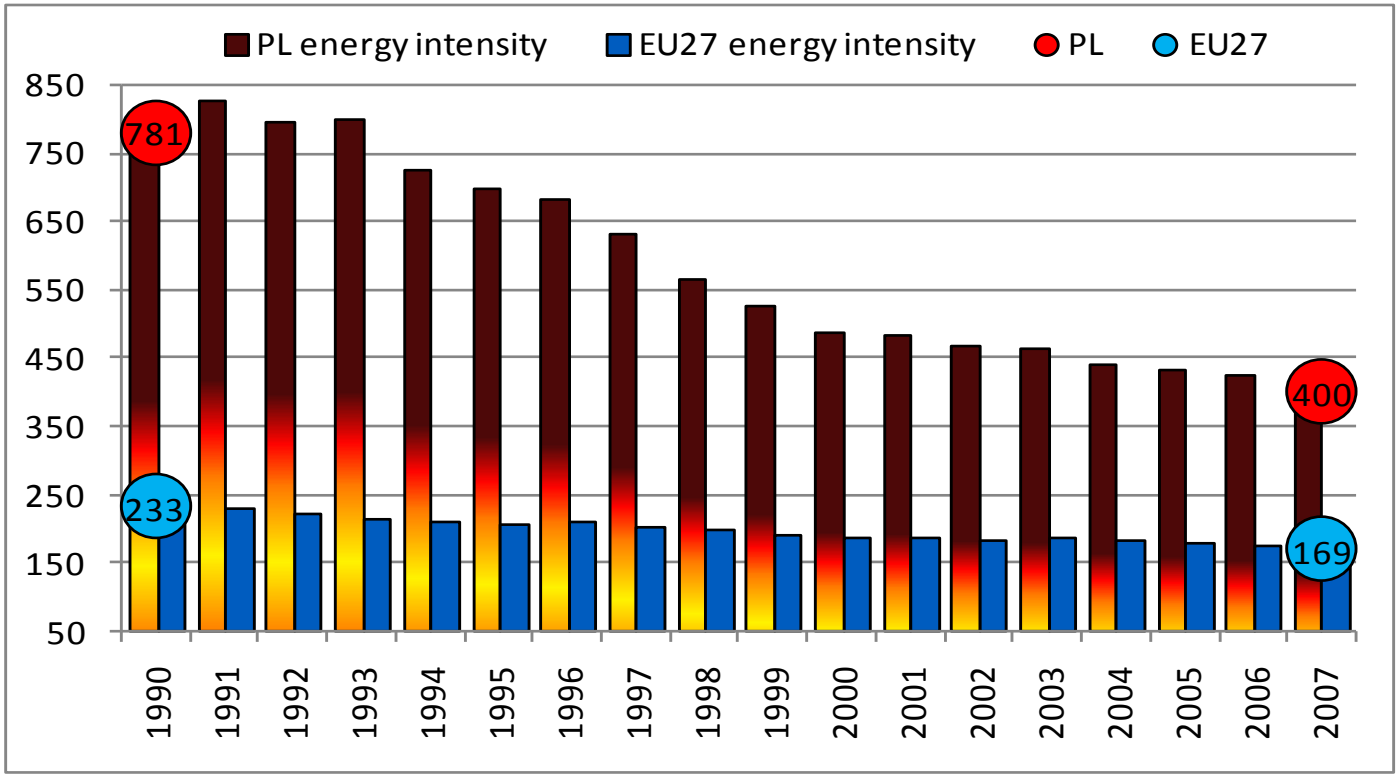
Poland's energy mix is dominated by coal to such an extent that it is an outlier in both Europe and globally.



Note: Energy consumption is gross inland consumption of energy.

Although Poland has made considerable advances in energy efficiency in the past 20 years, it has not yet reached Western European standards.

Energy intensity in the EU and Poland, in toe/M€



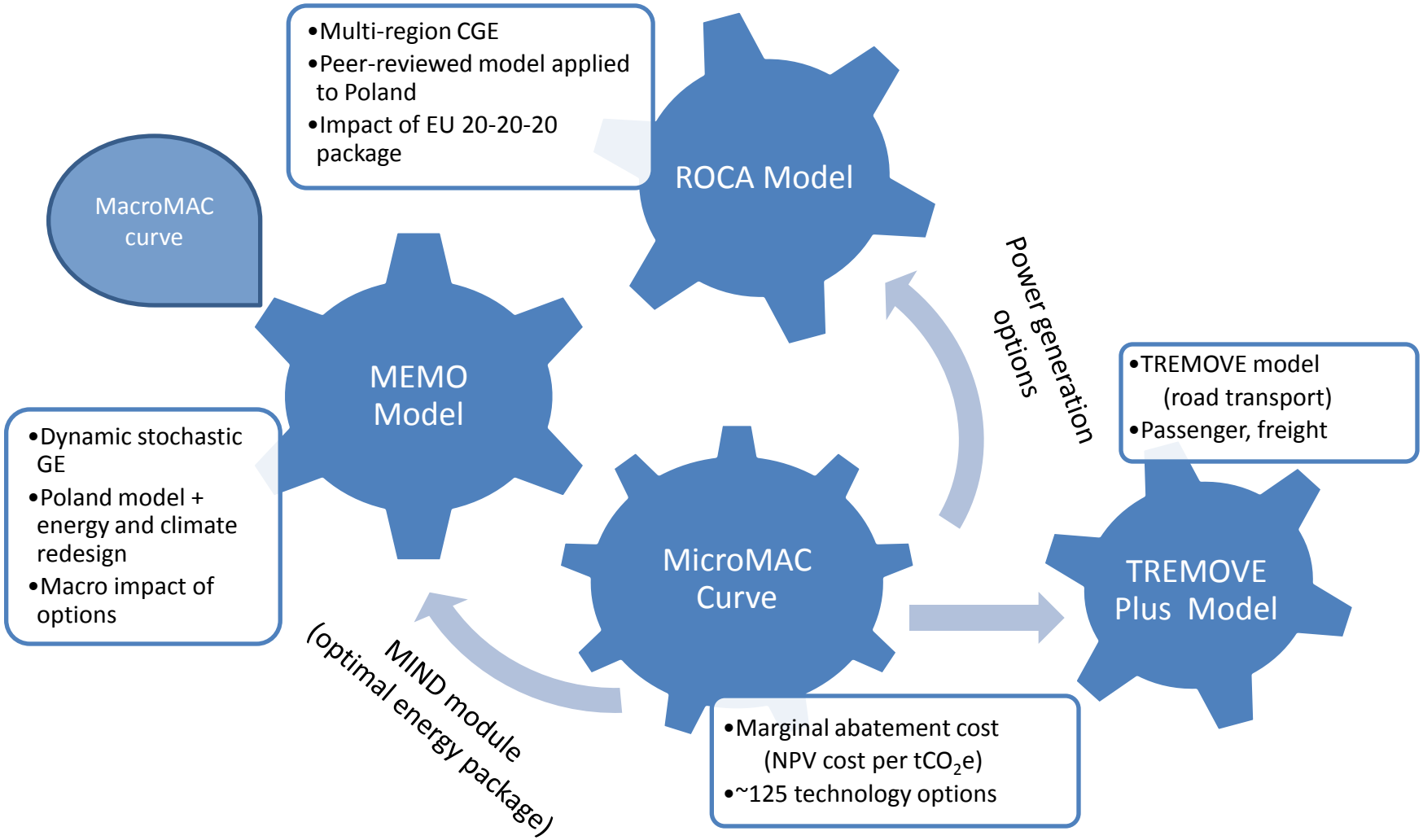
Note: Energy intensity is the ratio of gross inland consumption of energy (in toe, tons of oil equivalent) to GDP (in millions of euros at 2000 prices).

As an EU member state, Poland is subject to EU policies on climate change mitigation.

Breakdown of EU 20-20-20 regulations by sector groups

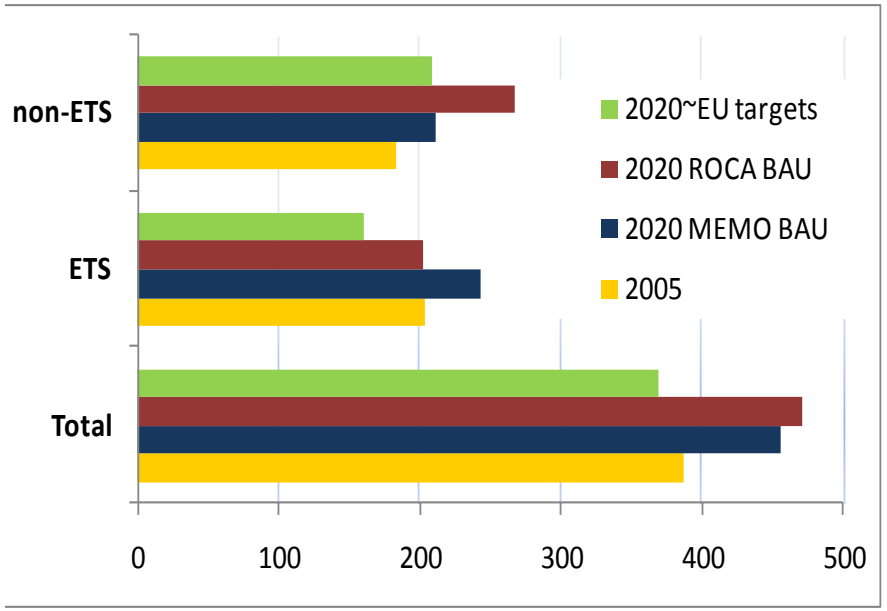
ETS sectors (that must use the EU Emissions Trading Scheme for CO_2 permits)		**Non-ETS sectors** (with national targets)
Power	Non-power	
Power stations and other large fuel combustion installations	Oil refineries, coke ovens, iron and steel, cement, glass, lime, bricks, ceramics, and pulp, paper and board, petrochemicals, ammonia, aluminum, acid production, and aviation (possibly covered from 2011 or 2012).	Transport, construction, services, smaller industrial and energy installations, agriculture, and waste.

A suite of complementary and interlinked models were developed for this low carbon growth assessment for Poland

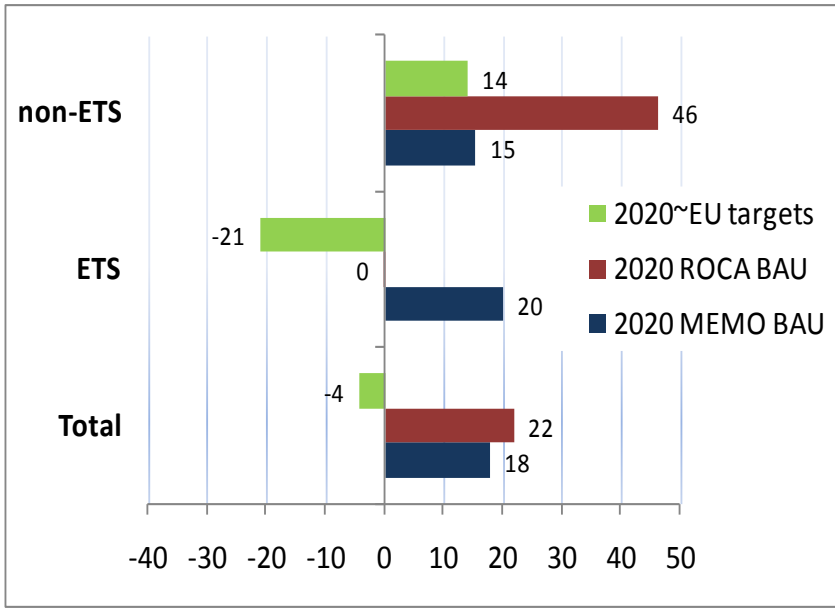


Business-as-usual scenario: Total emissions are projected to rise by about 20% by 2020, but which sectors will require the most intervention is harder to predict.

GHG emissions in Poland, 2005 and 2020 scenarios, $MtCO_2e$



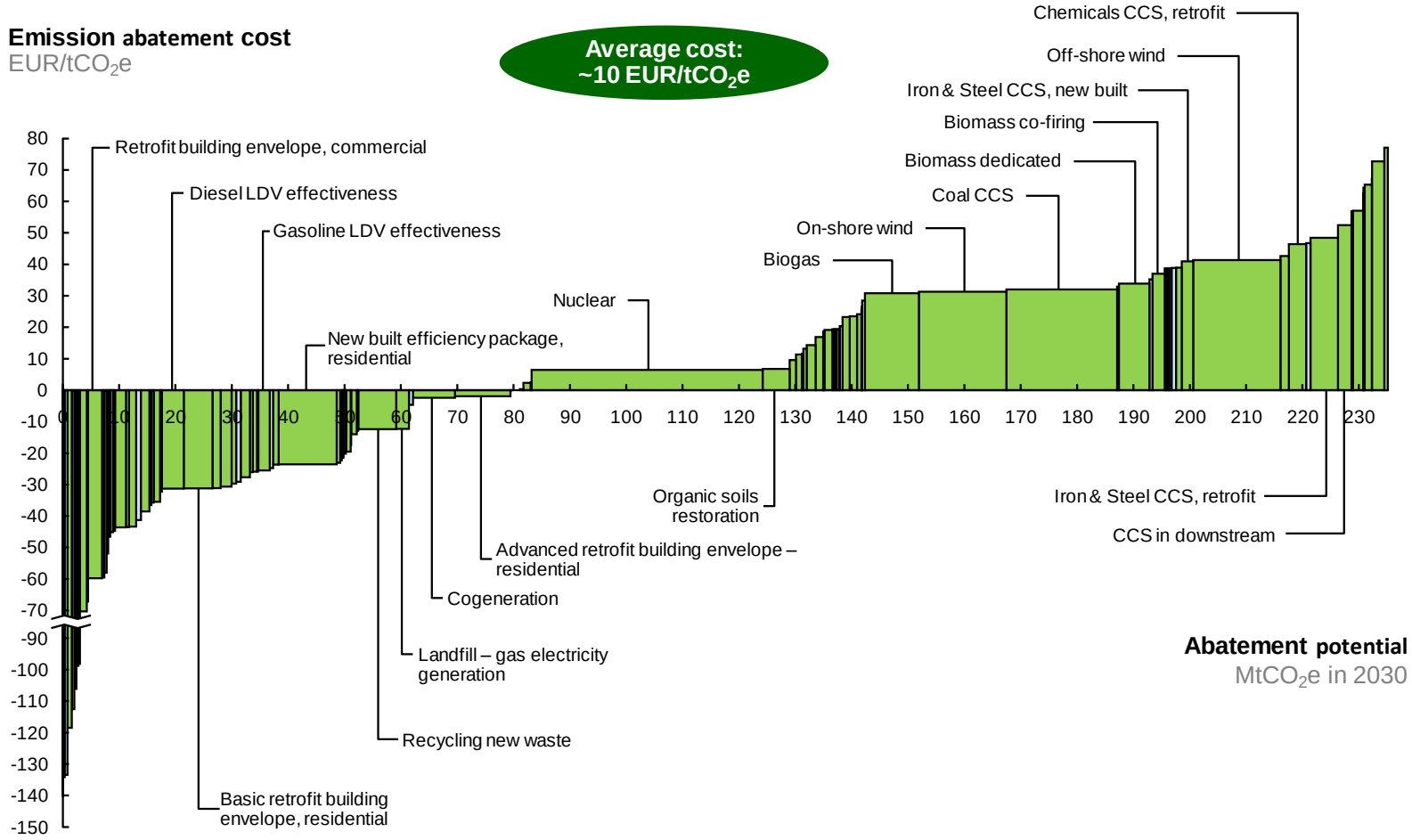
Changes in GHG emissions in Poland, 2020 scenarios vs. 2005, in %



Note: The MEMO ETS and non-ETS projections are corrected for small energy installation. The ROCA model produces CO_2 emissions so equivalent GHG emissions were estimated. Poland's EU ETS target is assumed to be the same (as a percentage change) as the EU-wide target.

Technical options for emissions abatement: Emissions can be cut by 1/3 by 2030 by applying existing technologies, at an average cost of €10-15 /tCO_2e.

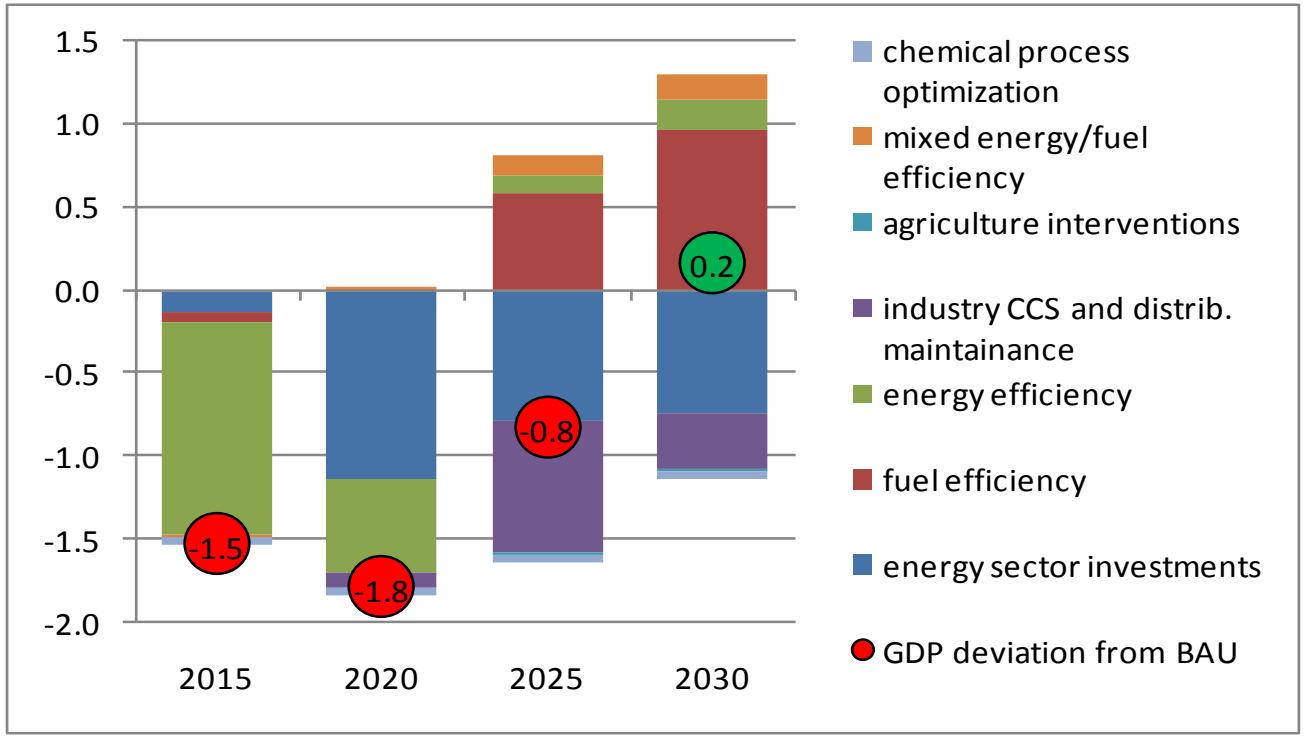
Microeconomic marginal abatement cost (MicroMAC) curve for Poland, 2030



Note: Each column is one of the 123 abatement measures. The height of the columns is the cost in € per abated tCO_2e. The width is the amount emissions can be reduced against business-as-usual levels projected for 2030. Some measures are shown with net benefits (negative costs).

Costs to growth: Total costs peak in 2020, and by 2030, growth recovers. "Micro-packages" that cut emissions most do not necessarily harm growth the most.

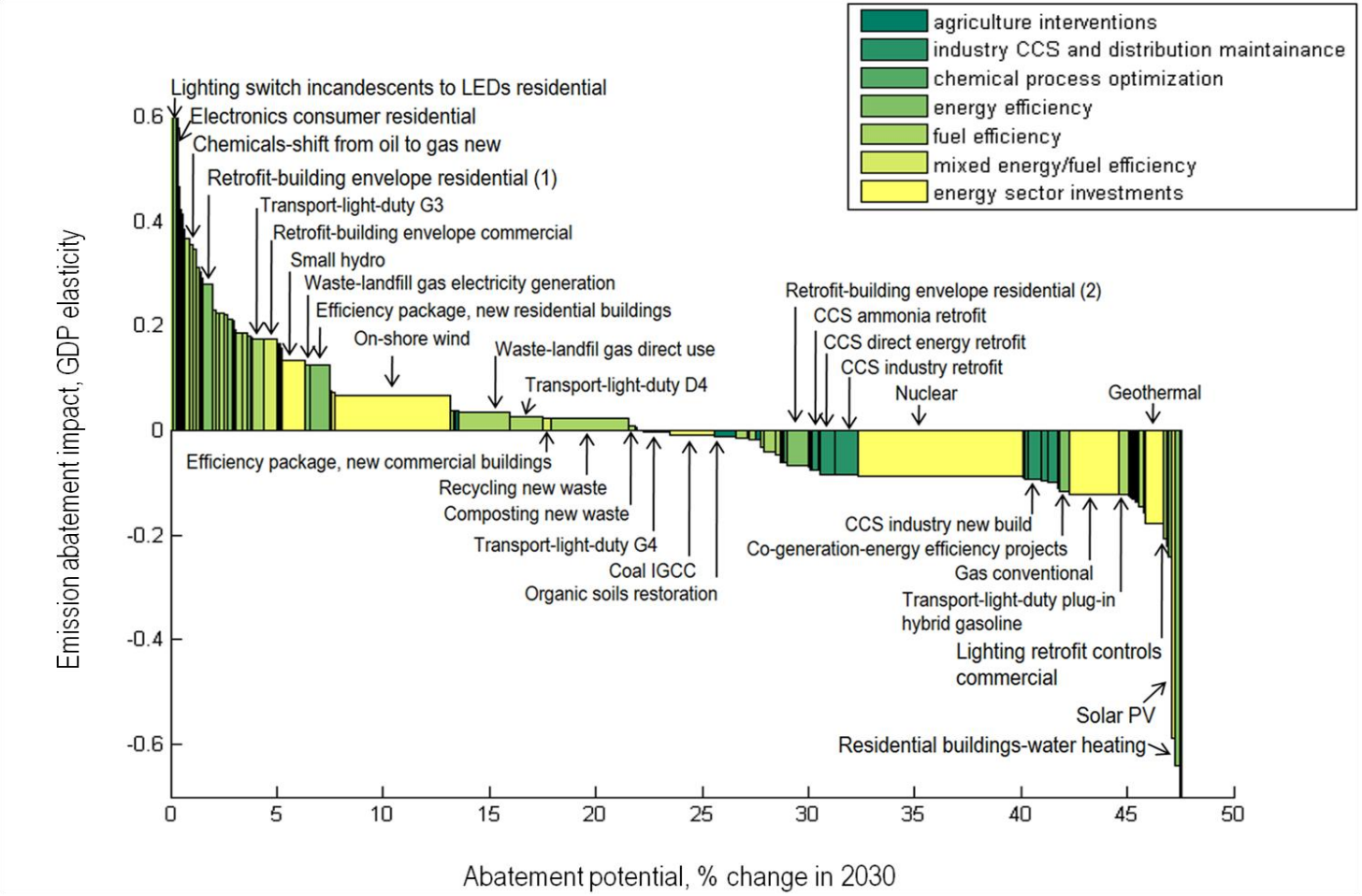
Decomposition of GDP impact of low carbon package, in %



Note: Change in real GDP is measured against business-as-usual scenario. Categories are micro-packages (mitigation options grouped by economic characteristics).

Impact on GDP growth of each technical option: The ranking of options shifts. Onshore wind and small hydro enhance growth more than some energy efficiency measures.

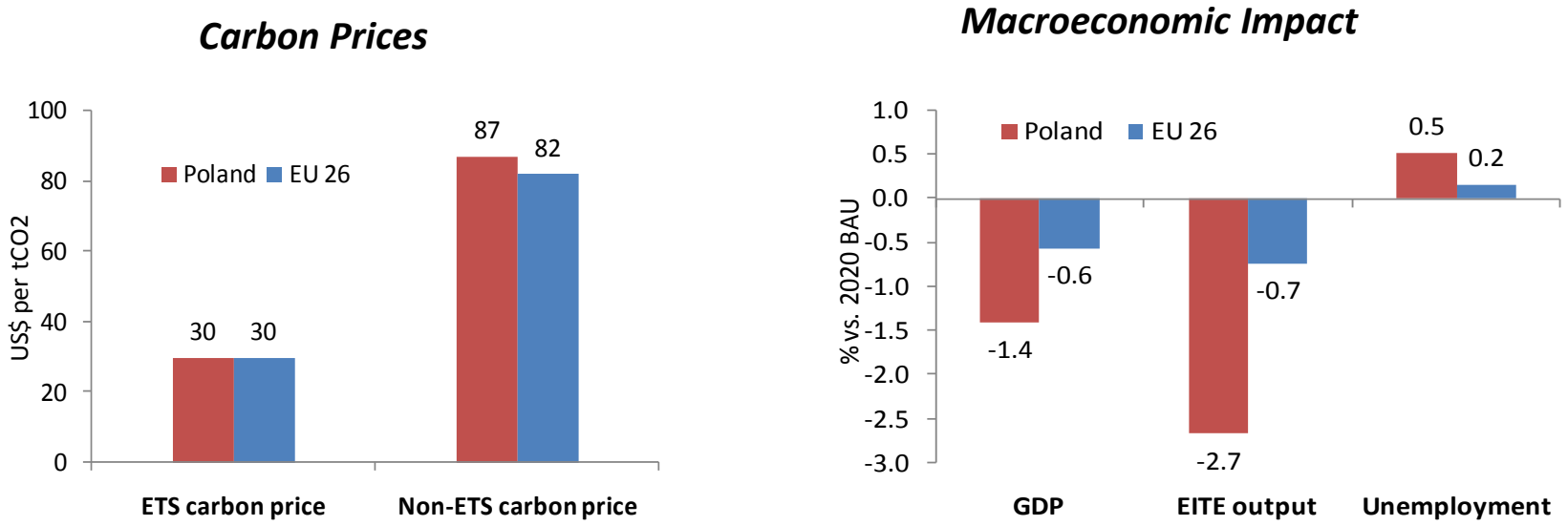
Macroeconomic marginal abatement cost (MacroMAC) curve, 2030



Note: Each column is one of the 119 abatement measures. The height of the columns is the marginal abatement impact in percent of GDP (for each percent of GHG abatement) compared to business-as-usual in 2030. The width is the percent emissions can be reduced. The area of any rectangle equals the GDP effect (loss or gain) of carbon abatement via any specific lever.

Implementing EU policy: Poland bears a modest economic burden despite dependence on coal and expected strong baseline emissions growth in sectors such as transport.

EU 20-20-20 package: carbon prices and macroeconomic impact



Note: EU 26 is rest of the EU excluding Poland. The carbon price in non-ETS sectors is a shadow price. EITE is energy- and trade-exposed sectors. Unemployment is the change in the rate in percentage points.

Three critical sectors

- ENERGY: The structure of the power sector will shift only slowly, even with government commitment to reduce emissions.
- ENERGY EFFICIENCY: These measures promise low cost abatement that delinks emissions from growth, but implementation is not easy.
- TRANSPORT: Poland needs to consider how to address the sector with the fastest growing emissions—transport. Behavioral change, rather than technology, is needed; and this may pose a tough policy challenge.

Thank you!

- Final report scheduled for February 2011.
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