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EU 2050 long term strategy

Appreciation of competitiveness

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Ministry of Economic Affairs and Climate Policy

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1. INTRODUCTION

On 28 November, 2018, the European Commission (EC) published a set of documents presenting its analysis of options for long-term climate policy in the European Union (EU). These provide the basis for discussion among the EU institutions to deliver Europe's formal long-term climate strategy to the United Nations by 2020, as per the Paris Agreement. The 2050 vision is also intended to become a topic at the "Future of Europe" summit in May 2019. In the documents, the EC lays out a vision for a transition to a climate neutral economy by 2050 - meaning Europe's net greenhouse gas emissions (GHGs) will be zero in that year. The vision states that this is technologically possible, and that it can be done in a socially fair and cost-efficient manner.

This report presents a discussion on competitiveness for the EU if it would go for 1.5 °C temperature increase by aiming at net-zero emissions in 2050 and the rest of the world would go for 2 °C temperature rise.

2. COMPETITIVENESS

In this section we address the following question:

- What if the EU goes for 1.5 °C temperature increase and the rest of the world goes for 2 °C temperature rise?

Macro-economic modeling shows different trends for global and fragmented actions
There have been two primary macro-economic models created to provide insight on the effects of the EU unilaterally achieving a 1.5 and 2°C scenario versus unified global action towards these goals. These have been developed by the Joint Research Centre (JRC) and Cambridge Econometrics and model the following scenarios:

1) **Fragmented 1.5°C** The EU achieves net GHG neutrality in 2050 (1.5 °C target) and the rest of the world achieves targets set by Nationally Determined Contributions (NDCs).
2) **Fragmented 2°C** The EU achieves 2 °C target in 2050 (81% reduction) and the rest of the world achieves targets set by NDCs.
3) **Global Action 1.5°C** The EU achieves net GHG neutrality in 2050 (1.5 °C target) and the rest of the world achieves 72% GHG reduction. With a global 72% reduction[1] of in 2050 relative to 2010, this scenario fits best with Europe going for 1.5 °C temperature rise and the rest of the world going for 2 °C temperature rise.
4) **Global Action 2°C** The EU achieves 2 °C target in 2050 (81% reduction) and the rest of the world achieves 46% GHG reduction.

Although the modeling results vary, they unanimously find that the effect of decarbonisation on GDP is limited. When comparing GDP in 2050 to the baseline, there is less than 2.2% change in all scenarios and models.

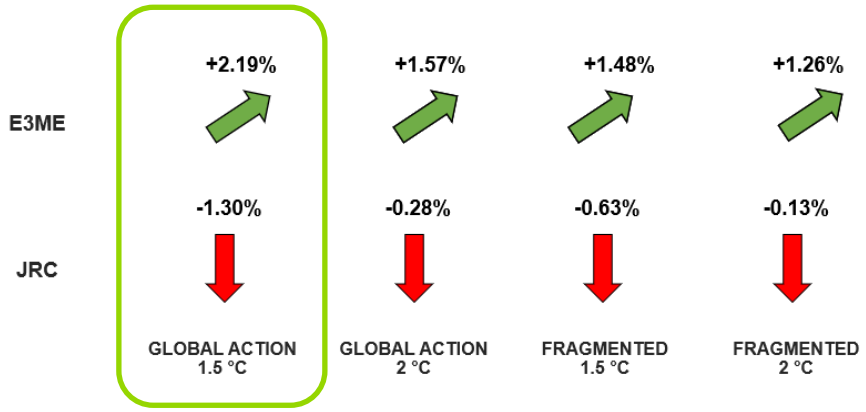

Figure 1. Percent change in GDP (in 2050 compared to baseline) for the four scenarios.

The JRC model shows that GDP declines 1.3% in the Global Action 1.5°C scenario and the Cambridge Econometrics E3ME model demonstrates an opposite trend, with GDP increasing 2.2%. These differences arise from assumptions regarding market imperfections and whether the economy operates at full capacity. E3ME assumes the economy is not at full capacity and that additional investments spur additional growth whereas the JRC model assume that the economy is in equilibrium and productivity decreases.

[1] A global stocktake of the Paris pledges: Implications for energy systems and economy (JRC, 2016)

It is important to note these long term models contain great uncertainty, and do not serve as economic forecasts. They can rather be used to assess the impact of key factors or assumptions from a high level and provide insight on the impact of decarbonisation on broad economic aggregates as well as the composition of output, employment, international trade and sectoral competitiveness.

For a 1.5 °C climate policy, the direct impact is logically that the EU would have greater costs in all sectors. Traditional economic models would show that extra investments in sustainable energy and energy saving measures lead to a competitive disadvantage and de-facto also some leakage of economic activities to other regions. However, as the rest of the world strives for a 2°C target, there will be additional investments outside of the EU in sectors such as wind energy or energy saving solutions that can possiblly lead to competitive advantages.

Individual sector assessment

When the JRC model is disaggregated into individual sectors, it show an especially negative impact on the fossil fuel sector in the scenario that comes closest to Europe going for 1.5 °C temperature rise and the rest of the world going for 2 °C temperature rise (Global Action 1.5 °C in the figure below). For the other internationally traded goods it shows a slightly negative effect of 1% for the chemical sector and a positive effect for all other sectors. This implies that the EU could benefit from first-mover advantages for internationally traded goods, especially for energy-intensive and trade-oriented sectors.

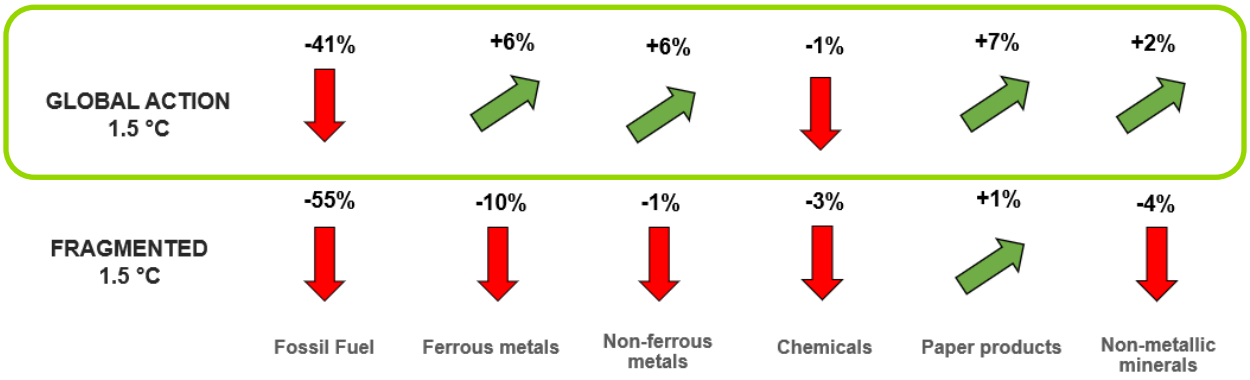

Figure 2. Percent change in sectoral outputs (in 2050 compared to baseline) for internationally traded good sectors for global and fragmented action in 1.5 °C scenario.

More ambitious targets can lead to greater employment

In all four scenarios for both models, however, an increase in additional employment in 2050 compared to the baseline is consistently observed. In general, the more ambitious 1.5 °C scenarios improve employment to a greater extent than the 2 °C scenarios. Research performed by NTUA supports these general findings and often shows that if climate policy is combined with a reduction in labour taxation, there can be all types of benefits by shifting sources for tax revenues, in particular for employment.

A 1.5°C scenario can increase both energy independence and savings fossil fuel imports

As a net fossil fuel importer, a 1.5 °C climate policy would mean the EU has less dependence on energy exporting countries and regions like Russia and the Middle-East. This is the case for a 2 °C strategy as well, but to a larger extent for a 1.5 °C strategy. As shown in Figure 3, the EU could also have greater cumulative savings on net import of fossil fuels with a 1.5 °C strategy.

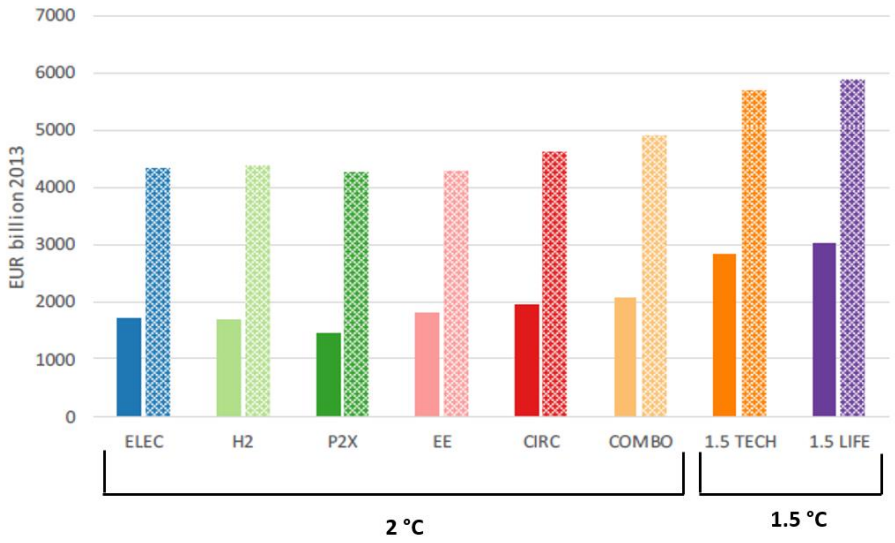

Figure 3. Cumulative savings on net imports of fossil fuels, difference from baseline in 2031-2050 (full bars) and 2051-2070 (patterned bars).

Mitigation of potential negative impact on competitiveness for energy intensive industries
Europe going for a more ambitious target than the rest of the world could especially have a negative impact on energy intensive industries such as the fossil fuel industry and chemical industry. The impact on competitiveness can be approximated by indicators on emission-intensity and trade-intensity. The higher the trade-intensity, the more exposed a sector would be to international competition. Negative impact on competeveness can lead to 'carbon leakage'.

Most relevant 'channels' for carbon leakage are:

- Production moves to another part of the world (outside EU)
- Investments move to another part of the world (outside EU)

Other 'channels' for carbon leakage could be:

- Fossil fuel channel: lower demand in Europe may lead to lower price internationally and therefore result in higher consumption elsewhere, but is difficult to model. OPEC policies have more impact on fossil fuel prices.
- Spillovers: if Europe innovates more, more companies may be attracted to Europe. This seems also partly assumed in the in-depth analysis of the EU climate strategy. But if energy intensive industries move to outside Europe, it is also possible that the value chain moves outside of Europe as well.

With the introduction of the European Union Emission Trading System (EU ETS) in 2005, Europe gained experience with addressing the concerns on loss of competitiveness and carbon leakage for sectors such as cement, steel, aluminium, pulp and paper, basic inorganic chemicals and fertilisers/ammonia. Current studies show no conclusive evidence that carbon leakage due to the EU ETS has taken place so far.

Potential carbon leakage could be avoided by (temporary) anti-leakage policies. There is a set of policy instruments available to mitigate the negative impact on competitiveness and still stimulate the transition to deep decarbonization, with the main types being:

- **Partial compensation or exemptions** where companies only have to face a cost of a share of their emissions, effectively facing a lower cost per tonne of emissions. Companies still retain the financial incentive to reduce emissions, but the incentive is lower. Examples include partial rebates for carbon taxes or financial compensation for a portion of the indirect carbon costs in electricity prices due to the EU ETS .

- **Performance-based incentives** where companies only face carbon costs up to certain GHG emissions-based performance benchmarks and companies that perform better than the performance benchmark are rewarded. Examples include emissions trading systems such as the EU ETS or California cap-and-trade system, where companies receive free allowances up to the emissions benchmark. If their emissions are higher than the benchmark they need to purchase emission allowances, and if their emissions are lower than the benchmark they can sell these allowances.

- **Border carbon adjustments** where importers face a carbon price based on the carbon footprint of their imported goods and material and/or exports receive a rebate for the carbon costs associated with producing the goods or material. There are no practical examples of border carbon adjustments due to countries arguing that it is against World Trade Organisation rules. However, an example with similar traits to a border carbon adjustment is imported electricity in California, where electricity companies that import electricity have to surrender allowances for the associated GHG emissions with the imported electricity.

Full exemptions and compensation based on historical emissions are not included in the list of potential policies to mitigate the negative impact on competitiveness as these do not stimulate the transition to deep decarbonization.