
SUPREMA climate change mitigation analysis

The effectiveness of ambitious EU agricultural mitigation efforts in a global context

“Holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C” as set out in the Paris Agreement, is among the key goals of the European Commission. In the EU’s Long Term Strategy for climate change mitigation, the European Commission proposed to target climate neutrality by 2050, which will require substantial efforts across all economic sectors, including the EU’s agricultural sector. In this study that was published as deliverable of the SUPREMA project, we applied three state-of-the-art agricultural sector models developed at the University of Bonn (CAPRI), the International institute for Applied Systems Analysis (GLOBIOM), and Wageningen Economic Research (MAGNET) to assess the impact of ambitious EU wide agricultural mitigation efforts emulated applying a carbon price on agricultural emissions consistent with the 1.5 °C target (245 USD/tCO₂eq by 2050).

Results showed that a unilateral EU mitigation policy where only the EU takes ambitious mitigation action that if adopted globally are consistent with the 1.5 °C target results in domestic EU GHG emission savings from agriculture of around 145 MtCO₂eq/yr (-35% compared to 2010 emission levels) on average across the three models. EU emission savings are mainly related to the ruminants which contributes 80% of the total mitigation potential while food and feed crops and other livestock such as pigs and poultry play only a minor role in mitigation efforts. As part of the EU (beef) production is reallocated to the rest of the world in response to the carbon price which penalizes GHG intensive domestic production, agricultural production and emissions increase in the ROW. “Although the leakage effect is significant, 48%, the important finding is that even a unilateral action from the EU side would contribute to global warming stabilization. In addition, indeed the market effects on consumer prices of such a unilateral action are rather small which highlights that there is an advantage for early-movers. Hence, the EU should not hesitate to engage in significant mitigation efforts even if not immediately followed by other countries” insists Dr. Petr Havlík one of the co-leaders of the present study.

“However, if next to the EU also other regions join the mitigation scheme and start to pursue at least modest mitigation efforts in agriculture, model results show that economic impacts on EU farmers are even less pronounced since EU farmers rank among the most GHG efficient producers worldwide” explains Dr. Stefan Frank from the International Institute for Applied Systems Analysis. If ambitious globally coordinated mitigation efforts in line with the 1.5°C target were adopted for the agricultural sector, EU beef producers could potentially benefit and increase domestic production levels due to their high GHG efficiency.

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Results also highlight the importance of globally coordinated mitigation action to achieve substantial contributions from agriculture. Already modest (25 USD/tCO₂eq by 2050) agricultural mitigation efforts in the ROW are found to prevent EU emission leakage and deliver 20 times more mitigation as compared to a unilateral EU mitigation policy. Therefore, sensible mitigation policy design in agriculture e.g. different effort levels across regions, is important to avoid overburdening livestock producers in regions in the global South that could further exacerbate food security issues in that regions. Likewise, steering efforts towards GHG intensive commodities may help to achieve already substantial emission savings.

The complete study is available for download here:

https://www.suprema-project.eu/images/Deliverable_D3.3.pdf

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