

Electrification of heating and mobility: Socioeconomic impacts of non-ETS policies with sector coupling and sectoral linkages

Project aim:

ELECTRO_COUP will design full decarbonization scenarios for the sectors transport (service: mobility) and buildings (service: heating) in Austria, that are not part of the EU Emissions Trading (non-ETS). The scenarios aim at achieving the Austrian decarbonisation targets for 2030 and 2040 and reveal the consequences on energy and socio-economic indicators.

To achieve the required deep emission reductions in the Austrian heating and transport sector, stronger cross-sectoral linkages among the different energy uses and energy carriers are needed. This approach is commonly referred to as “sector coupling”. The term implies to integrate electricity, gas, heating/cooling, mobility systems and markets to benefit from new energy sources and technology solutions. Such cross-sectoral linkages are recognized as a cost-effective decarbonisation strategy that provides significant flexibility to the system.

The decarbonization path designed in the project combines fuel-shifts and efficiency increases in the non-ETS with support measures for renewable electricity and heat generation, including storage. This policy mix that explicitly takes sector coupling into account, increases the efficiency of GHG reduction across sectors. A major part of the non-ETS changes is driven by electrification, which additionally allows for new efficient technology diffusion. The results of such an analysis also reveal, that leakage and shifting of fossil energy use from end-use to carbon-intensive electricity generation is a threat that has to be considered by the policy mix.

The outcomes of the research project will improve the knowledge on the potential of sector coupling for decarbonization in Austria and on the associated socio-economic effects. We will identify suitable measures and approaches in an integrative modelling approach that covers sectoral leakage and gives evidence on possible problems in the electricity sector due to growing electrification in mobility and heating.

Important questions:

- How can the electrification of the Austrian mobility and heating sectors and sector coupling contribute to deliver the Austrian decarbonisation targets for 2030 and 2040? What are the expected consequences on common energy and socio-economic indicators (e.g. GDP by industry, employment by industry and occupation, consumer welfare)?
- How much additional electricity is needed to couple the power sector with transport and heating and how is this additional electricity supplied, given the ETS caps and prices?
- Which instruments can be recommended to support efficient storage technologies and renewable penetration in the electricity sector in supplying the additional electricity demand?

ELECTRO_COUP

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