

In light of the urgency to fight climate change, the European Union (EU) aims to become carbon neutral by the middle of this century. This objective is supported by a number of actions gathered recently under the umbrella of the European Green Deal policy package. The EC implementation plan states that this legislative framework aims to (i) boost energy efficiency and eco-design of products, (ii) empower consumers and help EU countries to tackle energy poverty, and (iii) develop the full potential of Europe's offshore wind energy.

The Energy Labeling Regulation and the Ecodesign Directive are at the forefront of the EU efforts to reduce the end-use energy consumption of household appliances and industrial machines sold in the EU market. The former instrument requires that the product carries a label that, among other product information, discloses its energy efficiency level. The latter instrument requires manufacturers of certain household and industrial energy-using products to comply with a minimum level of energy efficiency for the products they sell in the EU markets, essentially banning from the market products that have efficiency values below a certain threshold. Additionally, energy efficiency related building standards are among the most common policy tools that have been used by European countries over the last forty years.

These regulations are of remarkable importance in light of the fact that end-use energy efficiency could save about 35% of the global CO₂ emissions, under the scenario of an almost triple world GDP by 2050. At the same time, at the EU level, household appliances contribute nearly 25% to the total energy consumption, with obvious effects on GHG emissions. Therefore, in this project we focus on the adoption of energy efficient technologies by households, as well as design and evaluation of policies to improve diffusion of these technologies, are important areas which warrant further study.

In this project, we use structural economic models to explore the demand for household appliances in the EU, with a special focus on the CEE Member States. The methods that we want to develop and extend can be used to assess consumer benefits/costs associated with the introduction of, for example, minimum quality standards by comparing valuations of consumers over time facing choice sets that differ due to regulations. They can also inform about the effectiveness of labeling policies, as this can be viewed as an additional product characteristic. More importantly, such models can be used for designing tax and subsidy policies to accelerate the shift towards energy-efficient technologies.

The proposed project has as its main goal to develop methods to enhance policy design. By focusing on mechanisms which can improve adoption of energy-efficient technologies, the methods we will develop and enhance will allow policy makers to design not only sound policies but also ensure that they will induce the desired responses from various stakeholders. Therefore, the outputs of our project will directly have implications for combating climate change. Although it may take time until societal contributions of the proposed project to materialize, we believe that our work eventually will have a significant social impact.