



DOCTORAL RESEARCH TOPIC:

The economic drivers that are enabling the transformation of the energy sector are helping it to adapt to the challenges of climate change and increasingly stringent environmental requirements

RESEARCH FIELD:

Economics (S 004)

BRIEF DESCRIPTION OF RESEARCH TOPIC:

The growing climate change commitments of major economies, particularly the European Union, will ultimately result in the complete decarbonization of the energy sector and at least partial decarbonization of the entire economy within the next few decades (by 2050). The majority of industry, buildings and transport will utilize electricity or electric fuels, such as hydrogen or synthetic fuels. The technical solutions to achieve complete decarbonization of the economy are already in place, but implementation will require complex solutions that encompass not only the technological but also the economic and social dimensions. It is essential that climate change mitigation does not disrupt the economy and increase energy poverty and exclusion. The issue is further reinforced by the climate change, which impacts both energy (heating and cooling) and generation (solar and wind power plants, heat pumps).

Problem definition. In order to make the transition to a renewable energy-based economy, substantial amounts of funds are/will be invested in the transformation, supporting both business/industry and ordinary citizens. A range of solutions are already in use, such as grants, subsidies, guarantees of origin, guaranteed market access, CDFs or combinations of these. While these support measures contribute to decarbonization, they also distort competition or increase exclusion.

At present, it is not entirely clear how the system should work, where every energy user can also be both an energy producer and a system service provider. How to involve not only large companies, but also small and medium businesses as well as common citizens.

Tasks. Analyze and propose a balanced set of incentives and other measures to allow energy producers to participate in the energy supply markets on an equal footing, without technological discrimination (based solely on techno-economic and environmental constraints). This system would allow consumers to contribute to system stability and cost reduction by participating in both energy supply, consumption and balancing markets. Such a solution would facilitate flexible adaptation to the changing regulations of the energy sector and ensure a reliable supply without increasing the overall system costs.

The incentive system proposed/analyzed will be resilient to changing climatic conditions and will be able to function properly under extreme climatic conditions, such as cold and windless winters or prolonged summer heat and limited hydroelectric resources.

Expected results. New knowledge on how different tax and support schemes can impact energy production, consumption and reliability of supply, while simultaneously reducing energy poverty and enhancing the affordability of personal mobility.

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