

A Systemic Perspective on Innovation from Energy Efficiency Policy efforts

Ph.d. thesis

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ENGLISH SUMMARY

In order to reduce climate change, resource scarcity and other global environmental issues major increases in energy efficiency are necessary throughout our energy system. Despite this daunting outlook and the fact that energy efficiency in most instances makes economic and environmental sense, these energy efficiency improvements do not occur by themselves. This challenge of low diffusion for energy-efficient solutions has been the subject of policy efforts since the oil crisis in the 1970s and they are gaining in attention.

In certain sectors, however, it seems like energy efficiency is starting to make a difference and businesses appear especially innovative in this field (Borup et al., 2009). This thesis therefore investigates the dynamics of energy efficiency innovation and, in particular, their relation to public policy efforts.

These innovation activities in energy efficiency have not been the subject of much research in the innovation studies field, where most attention is given towards energy supply technologies and energy end-use technologies tend to be left in the dark. This thesis applies different qualitative and quantitative research methods to analyse how actors are collaborating on innovation activities within energy efficiency. It furthermore investigates the long and complex process of innovation activities in energy efficiency with attention to the co-evolutionary dynamics of technology development, policy and market transformation.

The findings cover different aspects of the research topic. At the cross-sectoral level it contributes with insights into the collaborative RD&D activities in energy efficiency and how the structure of these development activities has an impact on the innovation output of the RD&D projects. It furthermore identifies the driving forces of energy efficiency innovation activities where market demand and policy efforts appear to have the most impact. The thesis also goes in depth with a single sector to describe the complexities of innovation processes in energy efficiency and the noticeable role of policy.

Overall the doctoral thesis provides an insight into the dynamics of energy efficiency innovation and the necessity of policy efforts. For innovation and market transformation to occur, strategic and integrated policies are absolutely crucial in order to overcome the barriers towards energy efficiency and thereby enabling energy efficiency innovation for the benefit of firms and the environment.