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Bachelorarbeit zum Thema

## **How do individual consumer preferences affect households' energy consumption and production behavior? An analysis of the key factors driving decentralization**

The energy landscape is becoming increasingly decentralized and progressively heterogeneous. Historically speaking, heating was provided by oil (or sometimes gas) and electricity by the local, centralized utility. Yet generous financial incentives as well as rapid price decreases of select distributed generation technologies have sparked a fundamental shift to the way people meet their energy needs. The electricity sector, in particular, has seen growing penetration of rooftop PV and, more recently, battery storage that has led to a switch from the classic consumer to the dynamic prosumer, able to use, feed-in and even store the electricity generated at their own home. And although the heating sector has remained rather unchanged, newer distributed generation technologies such as heat pumps and mini combined-heat-and-power (CHP) motors are gaining attention.

Yet, put simply, investments in distributed technologies should only occur if the marginal costs of producing one's own energy is lower than the price of the centralized supplier. For example, the end consumer should choose to install a battery storage if the increase in her own consumption of PV electricity yields a reduction in the costs of her electricity bill that are greater than the additional costs of the investment. However, what is often seen in reality is that end consumers are not completely driven by rational economic reasoning but rather non-monetary preferences, which may alter their energy investment and consumption behavior. The goal of this bachelor thesis is to understand (i) what factors (e.g., environmental awareness, technological interests, energy independence) may influence an individual consumer's energy decisions, (ii) what effect may these factors have on the end consumer's investment and consumption behavior and (iii) to what extent may these factors deviate from the rational economic choice?

The thesis will consist of an extensive literature review as well as a critical discussion of the challenges facing such analyses, which should address the first two research questions. A limited quantitative analysis in the form of, e.g., an Excel or Python tool should shed light on any economic inconsistencies between consumer rational and irrational behavior in the field of decentralized energy systems.

### **Ansprechpartner**

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