

THE VALUE OF FLEXIBILITY UNDER DIFFERENT RETAIL CONTRACT DESIGNS

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Extended Abstract

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Abstract Summary

The decarbonization of the energy sector is fundamentally reshaping the structure and operation of electricity systems across Europe. This transformation is driven by two main forces: the increasing deployment of renewable energy, and the electrification of the heating and mobility sectors through the deployment of heat pumps and electric vehicles (EVs). While these developments are crucial for achieving global and regional decarbonization goals and meeting climate targets, they also pose significant challenges in terms of maintaining grid stability, ensuring cost-effectiveness and optimizing power system operation.

In this context, flexibility — i.e. the ability of generation, demand and storage to respond dynamically to price signals or system conditions — emerges as a critical tool for ensuring system reliability, economic efficiency and sustainability.

In 2024, the Swiss household sector was the largest consumer of electricity with a share of 34.5% (SFOE, 2025), a figure which is expected to rise in the coming years thanks to current policies aimed at further electrification of the transportation and heating sectors. By operating their demand flexibly in response to price signals, households could reduce their energy costs and contribute to the efficient operation of the power system (Borenstein, 2019). Therefore, it is important to estimate the value of flexibility for the Swiss household sector, as this can help to establish and prioritize appropriate regulatory measures to promote flexibility.

To this end, in this paper I aim to estimate the value that Swiss residential consumers could obtain from operating their energy assets (e.g. electric vehicles, batteries, and heat pumps) flexibly under different retail contract designs and technology combinations.