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List of abbreviations

Project goals

The proposed project will provide answers to two major research questions: (i) What are the most effective policy instruments to steer households' electricity demand and to foster environmentally responsible consumption in the electricity market? (ii) How do these instruments work in competitive and non-competitive environments and how does the market structure affect the effectiveness of different policy tools?

Summary

We compare the effectiveness of standard and behavioral policy instruments for reducing private users' electricity consumption. We investigate into the dependence of the instruments' effectiveness on the market structure (monopoly vs. competition). Given the planned liberalization of the Swiss residential electricity market, we will provide important insights for policy makers striving to foster sustainable electricity consumption.

Work undertaken and findings obtained

The project started on October 1st only. Since then we have hired a new PhD student (Simon Grässli) to work on the project and we have concretized the design of the first experiment (see section 1.1 in the 'Progress Statement' below). Moreover, we have spent time in further reviewing the relevant existing literature to inform our experimental design.

1. Progress Statement, November 2017

In the following, we supply a short progress statement and an outlook on future parts of the project.

1.1 Online Experiment

With reference to section 8. 'Time Plan' (cf. p. 8) of the submitted proposal, we are now in the process of finalizing the design of the first experiment and preparing the respective materials. In the following, we describe the design of the first experiment.

As described in section 1. 'Research Question' (p. 2) of the proposal, we will evaluate the effectiveness of standard and behavioral public policy tools that aim at steering households' electricity demand towards renewable energies. Furthermore, we will compare the effectiveness of these instruments in competitive (e.g., a liberalized market) and non-competitive environments (monopoly).

In the first experiment, we develop an experimental framework that models consumers' decision situation when choosing an electricity contract in the residential electricity market. In our experimental setting, consumers can choose between electricity contracts with different sources of energy (e.g., water, solar, or wind) and at different prices. This setting allows modeling the trade-off between negative externalities and prices. We will implement the external effects of electricity consumption with the actual purchase of "Certificates of Guaranteed Origin" (similar to Ghesla, 2017).

In focusing on the behavior of electricity consumers only, we slightly deviate from the original plan of building the first experiment on the framework of Bartling et al. (2015), which also includes producers (cf. section 4. 'Methodology', p. 5). We still plan to run a second experiment based on the Bartling et al. set-up (see section 1.3 below), and thus plan to run three studies in total (instead of only two). Running the first experiment using a different methodology than originally planned has important advantages. First, individual participants in our experiment more closely resemble consumers in electricity markets than producers. Second, the policy tools we plan to evaluate mainly aim at steering consumer behavior.

Therefore, it is valid to focus on the consumer side in a first step. In the first experiment we thus plan to focus solely on consumers and to implement a decision situation that is highly comparable to real decision situations that electricity consumers face. By focussing on consumers only in a first step, we can achieve the parallelism between our experimental set-up and actual consumer decisions in the residential electricity market more easily.

To study our research question about the effect of market liberalization on green electricity demand, as a first experimental manipulation, we will vary the market environment. Specifically, we plan to increase the number of available electricity contracts, as an increased number of available contracts is a common characteristic of liberalized markets compared to monopolies. We intend to hold other factors such as prices constant across the two market regimes.

We will then study the effectiveness of different policy instruments in both market regimes. First, we plan to implement a tax on grey electricity. Second, we will test a default on a contract with a high share of renewable sources. Finally, we test both a descriptive and a prescriptive social norm.

We plan to conduct the first experiment online either on clickworker.de or on MTurk.com, both online marketplaces enabling individuals to perform tasks. Compared to a laboratory experiment, this procedure is less expensive and allows us to test more treatments. Furthermore, an online experiment is a natural decision environment for consumers and therefore increases the external validity of our results.

1.2 Field Experiment

In the second experiment, we plan to validate our results from the first experiment in the field. In a nation-wide representative sample of 500 residential electricity consumers, we will test the most promising interventions from the first experiment. Additionally, we will analyze how reactions to the interventions differ along socio-demographic characteristics, thus enquiring the potential distributive effects of these policies.

1.3 Laboratory Experiment

As a third experiment, we plan to conduct a laboratory experiment based on the experimental market framework of Bartling et al. (2015) as described in section 4. ‘Methodology’ (p.5) of the submitted proposal. This allows us to broaden the perspective and to study the effectiveness of the policy interventions in market interactions including both producers and consumers, as described in the original proposal.

National cooperation

So-far we did not realize any national cooperation. Hower, we plan to conduct a field study in collaboration with a market research institute and potentially together with a Swiss electricity supplier (see section 1.2 in the ‘Progress Statement’).

International cooperation

So-far none.

Evaluation 2017 and outlook for 2018

The designing of the first experiment, which took up the major part of time and effort so-far, went well, even though we slightly adapted our original plans (see section 1.1 in the ‘Progress Statement’). For 2018 we are excited to run this first experiment and to collect data. The results will provide first evidence

on how the the market structure (monopoly vs. competition) affects demand for green electricity and how the effectiveness of policy instruments for steering electricity demand depends on the market structure. Based on these results, we will further concretize the design of the two other experiments that we plan to run towards the end of 2018.

References

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Ghesla, C. (2017). Defaults in Green Electricity Markets: Preference Match Not Guaranteed. *Journal of the Association of Environmental and Resource Economists, 4*(S1), S37-S84.