ENABLING DEMAND RESPONSE IN POLAND

Understanding the major factors that impact the uptake of demand response

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Overview

There is a growing consensus that encouraging consumers to adjust their electricity demand in response to constraints of the electricity network, demand response (DR), is crucial for a more reliable, sustainable and efficient electricity system. Despite DR's potentials and binding EU provisions to enable it, the flexibility of the demand side still remains largely untapped in most of the European Member States. Various barriers preventing a wider uptake of DR in Europe have been reported in the literature. The most frequently discussed barriers include discriminatory regulation, uncertainty about the value of DR and insufficient consumer awareness. It is not clear why there is only moderate progress in removing these barriers. Although DR has been applied in e.g. the US and the UK on a significant scale for many years, major forces, both drivers of and underlying barriers to DR uptake, as well as DR-related strategies of key actors of the electricity system have not been sufficiently investigated. For this reason, it is difficult to draw conclusions on how to speed up and manage the diffusion of DR.
The aim of this study is to explore the mechanism of the DR uptake by examining the Polish electricity system.
The Polish case is likely to be of great importance in this context because of the imminent supply outages that demand immediate actions, the suitability of DR to address this and other challenges the Polish electricity system has faced, such as high CO2 intensity and constraints to finance new generation infrastructure. Numerous actions have already been undertaken to assess and seize DR's advantages in Poland, nevertheless the aforementioned common barriers to DR still largely hinder DR uptake, so that only a fraction of its potentials has been used.
The results of this study could be applied to other countries with a similar profile as Poland and contribute to the development of a conceptual model of DR uptake, which could be used to improve this process.

Methods

As my goal is to investigate the mechanisms of the uptake of DR, I chose an explorative case study approach as the most appropriate methodology. The data basis consists of:
1) Semi-structured qualitative interviews with experts representing key actors of the Polish electricity system; new market entrants such as DR aggregators; media, both mass media and media with focus on energy sector; and consulting;
2) Secondary data, mainly media and policy reports.
I conducted anonymous interviews with 15 experts from the four largest energy utilities, the Transmission System Operator (TSO), DR aggregators, the regulatory authority, media, as well as an independent scientific consultant. The interviewed experts described their perceptions of the drivers of and barriers to DR in Poland, outlined and assessed activities undertaken to implement DR and provided policy recommendations. The interviews were carried out in the period April – September 2015. An interview lasted on average 1 – 1.5 hours. The majority were carried out by phone. The interview language was Polish; for this paper, all interviews were transcribed and translated into English.
The analysis of the interviews followed the methodology proposed by Philipp Mayring. A combined deductive-inductive coding procedure facilitated by the software MaxQda was implemented.

Results

The key message of this qualitative study is that the slow DR uptake seems to be hindered by underlying barriers preventing systemic reforms needed for the implementation of DR. Regulatory hurdles, uncertainty about the value of DR and insufficient consumer awareness, often discussed in the literature as barriers hindering DR, are, in fact, merely symptoms of these real barriers. In Poland, coal-dependence and short-term-oriented political influence on energy enterprises have been identified as these underlying barriers. Both of them can explain the inertia of the Polish electricity system. As main drivers of DR uptake in Poland, supply security concerns and regulatory pressure from the EU have been revealed. These drivers are likely to have led to various DR-oriented initiatives, e.g. tenders for negawatts, which have been organized by the TSO since 2012, the opening of the balancing market to the demand side and pilot projects. These drivers have, however, not turned DR into a valid resource to address the challenges of the Polish electricity system. It has been estimated that so far only a fraction of DR potential has been tapped in Poland. Instead, building of new conventional coal-fired power plants has been chosen as main solution to avoid potential blackouts. DR, as a primarily software-based solution without large physical

infrastructures and which requires consumer involvement, is perceived as too complex and unfamiliar to be seriously considered as remedy for the problems of the supply-oriented, coal-dependent Polish electricity system. At least three of the four state-controlled energy utilities and the TSO have shown a profound interest in DR. However, possibilities for meaningful actions by these actors, which have a dominant position in the Polish electricity system but are subject to political influence, are limited by state policies designed to protect the domestic coal industry. As a result, these actors are prevented from a consequent adoption of DR, since it could aggravate the crisis in coal mining.

Based on the empirical results discussed above, a conceptual model of DR uptake in electricity systems was proposed in this study. This model stipulates that DR uptake depends on key actors' perceptions of the status quo of the electricity system in the context of the realisation of their major interests. If these interests are threatened and if DR is perceived as a potential means to protect them in light of the available alternatives, either more advantageous then or complimentary to the alternatives, DR uptake could be pursued. The inertia of a system such as the one in Poland can, however, represent a major obstacle to DR uptake.

Conclusions

DR uptake is a complex process that requires major changes to the electricity system. To tackle the underlying barriers, which prevent systemic reforms necessary to exploit the potential of DR in Poland, it is crucial to ensure support by political decision makers. The state is the most influential actor in the Polish electricity system, and it has shown that it is committed to protect the interests of the domestic coal industry, thus, in fact, largely maintaining carbon-lock-in in Poland. State policy has been assumed to be an effective means to overcome carbon lock-in, however, such a policy still needs to be developed in Poland. Raising awareness among the Polish political decision makers concerning the consequences of the coal dependence and concerning DR potentials to address the challenges of the Polish system seems to be crucial in this respect. As seen in the context of the energy transition in Germany (Energiewende), this kind of approach involves, among other dimensions, a long process and intense advocacy work of different societal groups. In the absence of a strong civil society in Poland, state-dependent energy utilities and the TSO seem to be the only actors with a sufficient expertise and capacity to influence political decisions and to initiate changes with regard to energy policy. A prerequisite for involving these state-dependent actors as institutional entrepreneurs is, of course, the awareness that the status quo threatens their future business. Investigating DR uptake in countries, in which this concept has been applied on a significant scale for many years, particularly regarding the main drivers of, underlying barriers to the process and related strategies of DR advocates, could provide valuable insights how to manage DR uptake more efficiently. This kind of research will help validate the model of DR uptake proposed in this paper.

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