AGGREGATORS IN THE ELECTRICITY SUPPLY SYSTEM: INTERNATIONAL EXAMPLES AND POSSIBLE APPLICATIONS IN AUSTRIA

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Introduction

This paper is dedicated to a potential new market player, which soon could participate in the Austrian electricity supply system and at the same time could act as an enabler of different Smart Grids applications: The aggregator.

The European Commission's Task Force for Smart Grids (Expert Group 3: Roles and responsibilities of Actors involved in the Smart Grids Deployment) defines aggregators as an actor, which *„[…] offers services to aggregate energy production from different sources (generators) and acts towards the grid as one entity, including local aggregation of demand (Demand Response management) and supply (generation management). [...]"*. [1] Additionally, as discussed e.g. within the framework of the ongoing project V2G-Strategies (compare [2], [3]), aggregators could offer a bunch of services to different types of market players (e.g. providing e-mobility services to end users and, at the same time, providing control energy to system operators or grid services such as load leveling to grid operators).

In Ontario, Canada, Local Distribution Companies (LDCs) [4], which are responsible for supply and distribution of electricity, are ecouraged to implement conservation and demand management programs [5]. The Demand Response 3 program [6] for instance pays end-users for their ability to shed load to control grid stress levels and/or prices. Aggregators are also eligible to participate in that program (e.g. EnerNOC [7]). Other programs in Ontario [8] involve direct load control (DLC) where utilities install equipment at consumers to allow them to modify the operation of appliances during peak periods (e.g. remotely controlled ‚smart' thermostats or air conditioning). This concept involves contracts with customers, which enable utilities (acting as aggregators) to increase or decrease load a certain amount of hours and/or capacity within a year (compare e.g. [9]).

In these Canadian cases the aggregator is licenced and strictly monitored by the regulatory authority. But as is shown in a recent study [10], if adequate market surveillance is not installed, a dominant utility also acting as an aggregator and so, undertaking demand side management, could strategically influence demand and prices on the market and realise significant profits at consumers' expenses.

Within this paper, the possibility of aggregators' involvement in the Austrian electricity market as well as its advantages, disadvantages, chances and risks from each stakeholder's perspective shall be evaluated, Thereby, the following questions will be answered:

- Which types of aggregators (e.g. aggregation of loads for demand side management or aggregation of generation) are feasible in the Austrian electricity supply system and which conventional market player (e.g. grid operator, generator, control area leader) could also act as an aggregator?
- Which effects (economical, organisational, etc.) could aggregator's actions have on other market players as well as on the functioning of the electricity market as a whole?

Method

Different aggregators' business models are discussed by analysing selected international case studies. Additionally, these examples and their integration in the specific electricity supply systems are compared to the Austrian system. By taking into account regulatory, economical as well as

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organisational aspects it is evaluated, whether an implementation of these business models in Austria would be feasible and if it indeed could facilitate Smart Grids applications (e.g. demand-side participation on the electricity market, active distribution grid concepts). Furthermore, applying a systematic step by step approach each of different actors in the Austrian electricity supply system is analysed, whether he/she could take the role of an aggregator and if yes, which particular services he/she could offer.

Results

Expected results will show options for the implementation of different types of aggregators and different aggregator's business models in the Austrian electricity supply system. Furthermore, advantages and disadvantages of these examples will be identified from each market actor's and stakeholder's point of view.

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