

INTEGRATION OF DEMAND-SIDE RESPONSE IN THE SWISS ANCILLARY SERVICE MARKETS THROUGH THE ENTSO-E CENTRAL SETTLEMENT MODEL

Aby CHACKO¹, Christoph IMBODEN², Ruedi KUMMER³, Thomas REITHOFER⁴

Abstract

The major challenge for integrating demand-side response is preparing a suitable market platform with clear rules regarding the interaction of the different stakeholders. Demand-side response has the technical capability to offer diverse grid services and the most challenging hurdle is to adapt the existing market rules which were initially conceived with centralized power generation in mind. The market rules must take the different stake holders into consideration. The ENTSO-E (European network of transmission system operators for electricity) central settlement model allows a central entity to settle the transfer of energy with the BRP (balance responsible party) which has been activated by an independent aggregator. This model allows the participation of demand-side response and distributed generation units in the Swiss ancillary service markets. The implementation is explained with the example of a municipal waste incineration plant that takes part in the Swiss aFRR (automatic frequency restoration reserves) and mFRR (manual frequency restoration reserves) markets through an aggregator.

Introduction

Demand-side response is gaining more focus as a provider of grid services. The ideal market design will be a deciding factor for enabling demand-side response. ENTSO-E has suggested different market design models for enabling the participation of demand-side response in the reserves and energy markets [1]. In Switzerland the Swiss electricity branch had already decided on a solution to enable the reserve providers to aggregate geographically distributed technical units to provide ancillary services to the Swiss transmission system operator (TSO, Swissgrid).

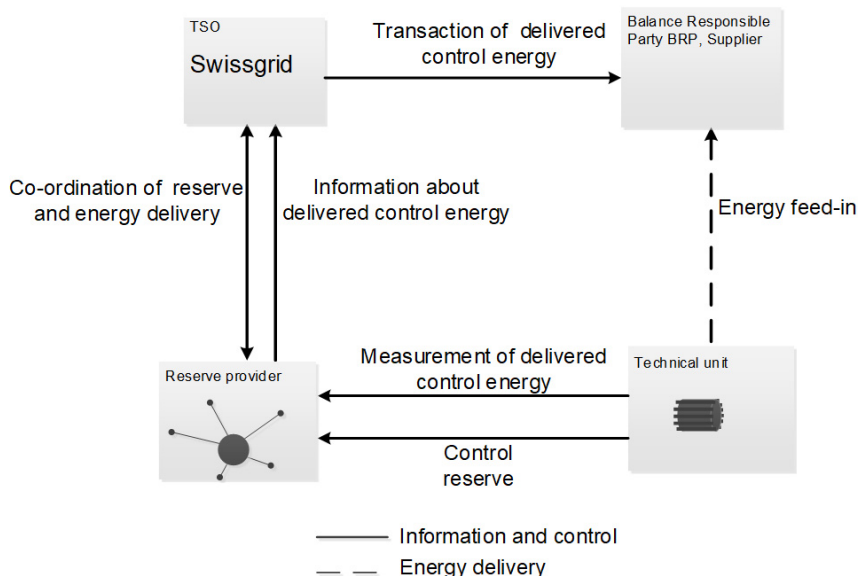


Figure 1: Energy, information and control flows in the central settlement model implemented in Switzerland. A reserve provider portfolio consists of technical units grouped into reserve providing units or groups. Illustration based on [2].

¹ Swissgrid Ltd, 5080 Laufenburg, Switzerland, Tel.: +41 795181734, aby.chacko@swissgrid.ch

² Lucerne School of Engineering and Architecture, 6048 Horw, Switzerland, Tel.: +41 41 349 3752, christoph.imboden@hslu.ch

³ Renergia Ltd, 6035 Perlen, Switzerland, Tel.: +41 414553300, ruedi.kummer@renergia.ch

⁴ CKW Ltd, 6032 Emmen, Switzerland, Tel.: +41 412495883, thomas.reithofer@ckw.ch

Among the different market models suggested in [1], Switzerland has implemented the central settlement model, which supports the settlement of energy from technical units belonging to balance groups outside the BSP's own balance group. The corresponding aggregator model was developed by the electricity branch of Switzerland as illustrated in Fig. 1 [2].

The model allows a balance group neutral extension of a reserve provider portfolio in which the Swiss TSO is responsible for the central settlement. The major advantage of the model is that it foresees confidentiality in the pre-contracting phase and in the post-contracting phase [1].

In this article, the Swiss ancillary service markets and products are briefly explained, then the central settlement model and the processes for its implementation are described. Subsequently the process is illustrated with the example of a municipal waste incineration plant, which offers aFRR, mFRR to the ancillary service markets. Finally the challenges and possible future developments for DSM in the ancillary service markets in Switzerland are described.

References

- [1] ENTSO-E Working Group, Market Design & RES, „Market Design for Demand Side Response, “01 11 2015. [Online]. Available: https://www.entsoe.eu/Documents/Publications/Position%20papers%20and%20reports/entsoe_pp_dsr_web.pdf. [Zugriff am 11 11 2017].
- [2] VSE, „Anbindung von Regelpools an den Schweizer SDL-Markt; Connection of control pools in the Swiss ancillary services market“, VSE, Aarau, 2013.