Shapeshifter Home

Description

The mission of Shapeshifter is to develop and maintain the open source communication protocol that resolves grid constraints by applying congestion management or grid-capacity management.

Shapeshifter implements the Universal Smart Energy Framework for flexibility forecasting, offering, ordering, and settlement processes. Additionally, Shapeshifter enables trading via DSO/TSO coordination platforms that also support the protocol.

Shapeshifter enables the fastest, fairest, and lowest cost route to a smart energy future by delivering one common approach to efficiently connect smart energy projects and technologies. Its market structure, roles, rules and tools for the commoditization and trading of flexible energy usage work with existing and evolving energy markets.

Shapeshifter focuses specifically on the exchange of flexibility between aggregators (AGRs) and distribution system operators (DSOs) or between aggregators and transmission system operations (TSOs). It describes the corresponding market interactions between them to resolve grid constraints by applying congestion management or grid capacity management.

Scope

Constraint management services

Constraint management services help grid operators (TSOs and DSOs) to optimize grid operation according to physical and market constraints. Four different flexibility services can be distinghuised within the constraint management category: grid capacity management, congestion management, voltage control and controlled islanding. Shapeshifter can be used for the first two of these.

Grid capacity management

Grid capacity management refers to the use of explicit demand-side flexibility (by the DSO or TSO) to increase operational efficiency without impacting freedom of dispatch, trade and connect (copper plate principle). It is primarily used to defer grid reinforcements, optimize asset operational performance, reduce grid losses, or support planned maintenance. The implication is that aggregators (and prosumers) participate in the product on a voluntary basis; i.e. motivated by appropriate financial incentives.

Congestion management

Congestion management refers to the use of flexibility to reduce peak loads, in order to avoid system overload and the associated component or system failures. Contrary to grid capacity management, it will typically limit freedom of dispatch, trade and/or connect. It is primarily used in unanticipated overload situations; e.g. those which could not be forecast during long-term grid planning processes, or where load/ generation increases have outpaced grid reinforcement efforts. Congestion management is a temporary solution (typically until grid reinforcement takes place) and is a highly-regulated mechanism.

The two mechanisms differ in the freedom of dispatch, trade and/or connect and this is handled via contracts and will have impact on the settlement components.

Bilateral trading and tradinig via a market platform

Shapeshifter is designed for bilateral trading between the aggregator and DSO. Trading via market platforms can bring added value. In , market platforms may take the role of trading counterparty, hence serving as a DSO proxy in trades with the AGR, and as an aggregator proxy in trades with the DSO.

TSO/DSO coordination

Shapeshifter assumes that a DSO or TSO can freely and independently trade flexibility with aggregators. Any potential goal conflicts can be settled through the market mechanism. Alternatively, TSO and DSO requests can be aligned, resulting in a TSO/DSO coordination platform where TSOs and DSOs coordinate the tendering, trading, activation and/or settlement of flexibility for their own purposes (i.e. ancillary services).

Shapeshifter can be applied without any further changes in a configuration where there is TSO/DSO coordination.

Communication with the community

The Shapeshifter Technical Steering Committee (TSC) aims to communicate as open as possible.

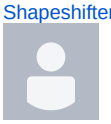
- Monthly TSC meetings are openly accessible to anyone interested;
- Updates are send via de Shapeshifter discussion email list;
- Meeting minutes are published at Github;

Important links

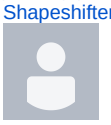
- Github Repository - technical information
- Project Charter - on Github
- Project Licence - on Github

Recent space activity

Jelle Wijnja
Shapeshifter Home updated Feb 21, 2022 view change



jelle.wijnja@alliander.com
Shapeshifter Home updated Feb 10, 2022 view change



John Mertic
Shapeshifter Home created Aug 31, 2021

Space contributors

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