HORIZON 2020

TSO-DSO-Consumer INTERFACE aRchitecture to provide innovative grid services for an efficient power system

Results in Brief

Powering the transition to a distributed, smart grid

The digital revolution in the energy sector is sparking hope for securing a more sustainable future. INTERRFACE is designing a common architecture with standardised products and processes that joins power system operators and customers, allowing seamless, transparent exchange of energy services across the power system.

DIGITAL ECONOMY

CLIMATE CHANGE AND ENVIRONMENT

ENERGY

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With the network codes drafted by ENTSO-E and the Clean energy for all Europeans package, the EU has set the energy transformation in motion.

The measures encourage service procurement at both the transmission and distribution levels, thereby enabling more effective network management, increasing the level of demand response and growing the renewable generation capacity. Transmission and distribution network operators are now called on to define and coordinate the procurement services in collaboration with active market users.

“Digitalisation facilitates the coordination and active system management in the electricity grid, enabling transmission and distribution network operators to optimise the use of distributed resources and ensure a cost-effective and reliable electricity flow. What’s more, end users can become active market participants, for example by selling self-generated electricity or balancing energy demand,” says Georgios Boultadakis, coordinator of the EU-funded INTERRFACE project.

Interoperable solutions will be key to overcoming technological barriers that currently hinder seamless data exchange between value chain actors and systems.

New platform helps derive value from digital technologies

INTERRFACE helps connect the dots between all parties across the entire electricity value chain through the design of an Interoperable pan-European Grid Services Architecture (IEGSA). Acting as an interface between transmission and distribution network operators, it introduces standardised ways of market operation, service design and procurement.

“The new platform for electrical grids and its interconnected tools and applications simplify market processes such as grid pre-qualification. They also reinforce the role of aggregators, who can transform the electricity business by lowering the entry barrier to the retail energy market, forging a firm link between consumers and the energy market and setting small players at a level playing field,” adds Boultadakis.

Moreover, this refined service architecture integrates the main tools and data for network operators, power exchanges and market participants, fosters communication between different data hubs and market applications, and ultimately facilitates energy market integration.

A glimpse into the inner platform components

The IEGSA platform comprises a set of components that smooth the day-to-day market operations. The flexibility register component gathers and shares relevant information on potential sources of flexibility, enabling the seamless connection of flexibility service providers and allowing them to bring their flexibility products to the markets. It collects static and dynamic characteristics of flexibility resources, creating accurate insight into the available flexibility potential, while also enabling efficient portfolio management for service providers.

The coordination platform fosters the collaboration between power system operators, allowing data exchange through well-defined, interoperable and standardised application programming interfaces that meet the Common Information Model standard. It also facilitates the bid qualification in various interconnected service markets.

Another component, the single interface to market, helps connect marketplaces with the platform, allowing the exchange of market-related data. Finally, the settlement unit is responsible for calculating the energy settlement.

INTERRFACE’s platform has been deployed in nine countries. The demonstrators cover three thematic areas: congestion management and balancing, peer-to-peer trading and the pan-European electricity market.

“Overall, the achievements of the INTERRFACE project are paving the way towards integrating greater volumes of renewable energy to the electricity system without compromising security of supply, which is key to achieving carbon neutrality in the EU by 2050,” Boultadakis concludes.

Keywords

INTERRFACE
procurement
power system operators
digitalisation
distributed resources
grid services architecture
energy market integration
peer-to-peer trading

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