

# Universal Smart Energy Framework (USEF)

One common smart energy standard for a unified European power system, built around consumers, with commercial and environmental benefits for all

**AS** the opportunities to use and store energy are increasing, a new smart energy market is emerging, offering value to all players, putting residential and commercial users at its heart. However, for it to be truly sustainable – green, reliable and affordable – a uniform approach to change is required. USEF provides one common standard that fits on top of most market designs and supports value creation at all levels.

## More renewables, more innovation and more system complexity

Reducing greenhouse gas emissions and improving security of energy supply are pressing matters for Europe. As it stands, 53% of all EU energy comes from outside its borders and costs €400bn per year, with many member states relying on a limited number of suppliers. As a result, in October 2014, EU leaders agreed a proposal for a new framework on climate and energy, including binding targets to increase consumption of renewable energy from 15% to at least 27% of total energy by 2030.

The volume of renewables in the energy mix has been increasing over recent years and, with the new EU agreement, will continue to do so. On top of large centralised plants, an increasing share of renewables is generated locally, with consumers producing energy as well as using it. Increasingly they will also take part in storing energy. While the rise of electric vehicles has a growing impact on the volume and pattern of electricity demand, their batteries could also act as storage devices. More technologies that help to interface and shift consumer demand are on the horizon, allowing consumers to take an active role in the energy system.

The variability of renewables requires more flexibility from the grid, which is preliminarily designed to distribute centrally-produced electricity one way. It does not cater for the growing quantity of energy up and downloaders anywhere in the system and the transportation of electricity between them. The volume of variable electricity now produced by renewables creates power flow fluctuations that make balancing supply and demand increasingly difficult.

## The energy revolution has begun but we're reinventing the wheel

The boundaries and roles of the old world are changing. The energy revolution has begun. All indications suggest that a consumer-centric, distributed electricity model will become significant, with the transmission grid retained as a backbone. This is compatible with EU goals but achieving it fast, in a cost-effective and efficient manner is crucial. To do so requires that the European power grid and energy markets become more accessible, flexible and integrated. The European Commission recognises this and, in his speech on 31 March 2015, Commissioner Miguel Arias Cañete advocates a new electricity market design that is better adapted to the energy transition, and that puts consumers at the heart of the energy market, enabling them to control their consumption, lower their bills and benefit from new opportunities. Europe is moving into the 'Smart Energy' space and effective implementation is key to the energy union's success. The key questions really are: what does the new market design look like and when will it be available?

While politicians try to adequately legislate for this smart future, technology is in the lead. It is being applied in a piecemeal way,



particularly in the grid, to manage renewables integration. There are multiple, disparate smart energy projects underway, utilising interconnected technologies, demand response and financial market mechanisms. Whereas the shared goal is positive, the lack of uniformity or defined standards mean that we are already reinventing the wheel. Unless this is addressed rapidly, the whole will never be greater than the sum of its parts. In fact, we are at risk of those parts being incompatible, which is completely contrary to the drive for a single European market system. The Universal Smart Energy Framework (USEF) aims to resolve this.

**A common standard for the benefit of all**

USEF is being developed by the USEF Foundation, a non-profit partnership of seven organisations active in all areas of the smart energy space: ABB, Alliander, DNV GL, Essent, IBM, ICT Automation and Stedin. Their primary objective is to deliver one common standard to enable smarter solutions for energy exchange to the benefit of all in the system, from energy professionals and businesses, to consumers and prosumers. The framework delivers specifications, designs and implementation guidelines which recognise the speed at which the industry is moving and the fact that there is not necessarily one single approach to take. As an open framework, it is accessible to all stakeholders across the EU and, since collaboration is vital to its success, experts throughout Europe have been working together to develop and review the framework to ensure it offers maximum value to all. Ultimately, USEF provides a new smart energy standard that sits on top of, and encourages progress in, most market models. Working with USEF ensures that smart energy products are compliant and implementations fit together in an efficient and cost-effective way.

**Clear roles. Clear benefits**

USEF clearly defines market roles, how they interact and how working along one common standard enables value creation for each role, and introduces new roles like the (independent) aggregator. The framework also describes service capabilities, connectivity, data exchange and control features. Stakeholders can build on this to create competitive products and services which can be easily integrated with a smart energy system.

**Making sure that smart energy products are compliant and implementations fit together.**

**A new market design with residential and commercial users at its heart.**

**Open IT structure with standardised interfaces**

Interoperability of components is essential to prevent lock-ins and reduce the complexity and costs of a new energy system. To accelerate the development of smart energy products, services and solutions in an unambiguous way, USEF is an open framework, based on common IT architecture with standardised interfaces.

**Designed to ensure a high level of privacy and security**

With ‘Big Data’ prevalent in a smart energy system, privacy and security are a significant concern. USEF is designed to comply with the new European General Data Protection Regulation. It aims to strike the balance between guaranteeing security of supply, enabling value creation through innovative energy services and protecting customer privacy.

**USEF – Togetherness as an ingredient for success**

The USEF Foundation believes that one common standard is required to deliver a European smart energy future and that this can only be created by collaboration across stakeholders and across borders. Its framework has been developed and is being refined in this way, with people working together to achieve a shared goal for the good of everyone.

Commissioner Cañete really summed it up when he said “what could be more important than safeguarding the future of our planet, maintaining secure supplies of energy, and keeping that energy affordable?” The USEF Foundation has developed its framework to help achieve this mission in the most effective and inclusive way possible. If you would like more information about USEF or if you would like to help us to refine our framework for the future, please visit [www.usef.info](http://www.usef.info)



Frits Verheij  
 Technical Director  
 USEF Board Member  
 tel: +31 26 3562445  
[contact@usef.info](mailto:contact@usef.info)  
[www.usef.info](http://www.usef.info)

