

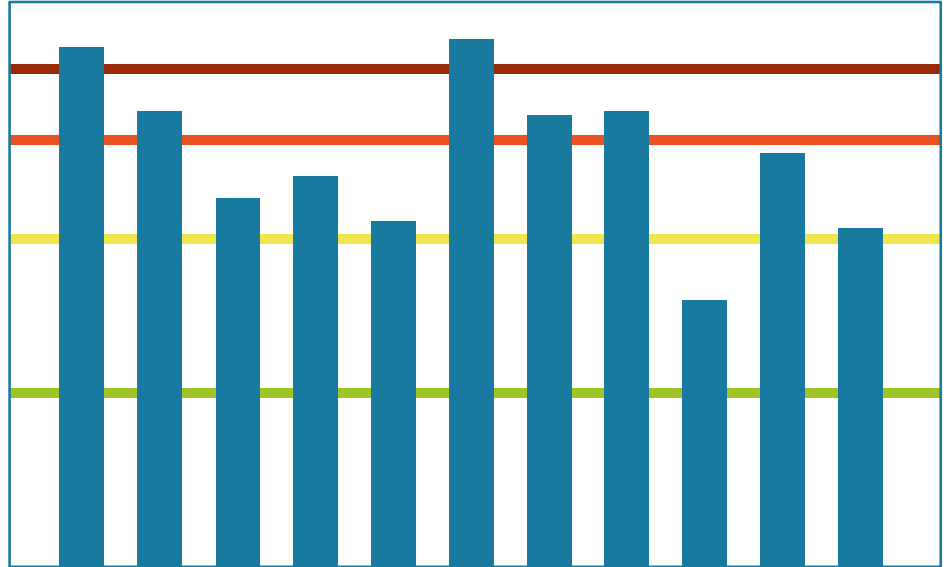
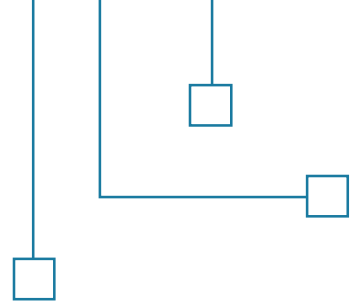
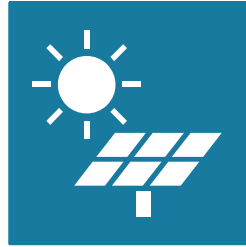


Universal Smart Energy Framework

Unlocking the value of
energy flexibility

Marijn de Koning -
USEF Design Team





More variations
in energy flows
causes more
complexity

More local
production

More local
players

And more up-
and downloads
of energy
anywhere in the
system

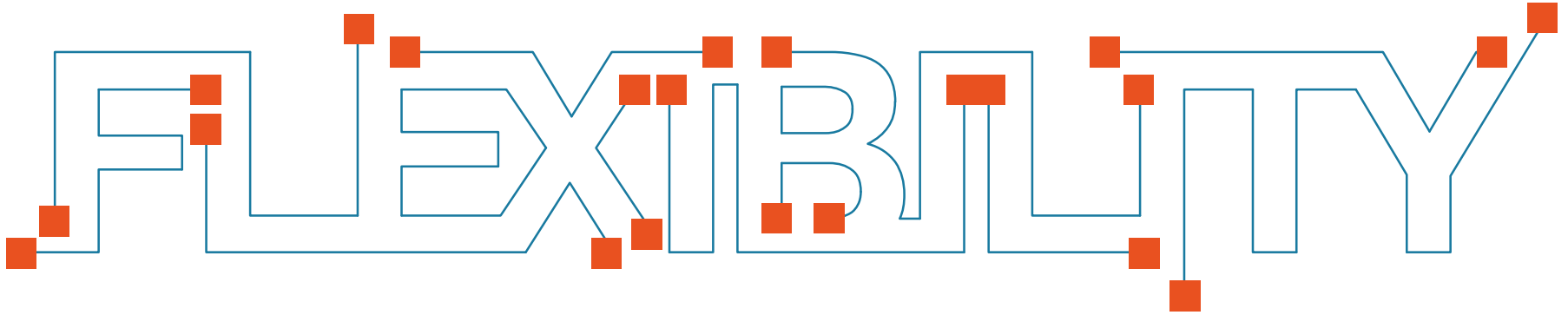


Energy
System

Traditional
energy system

Yet our
current
market system
was not
designed
to facilitate
more
Interaction.

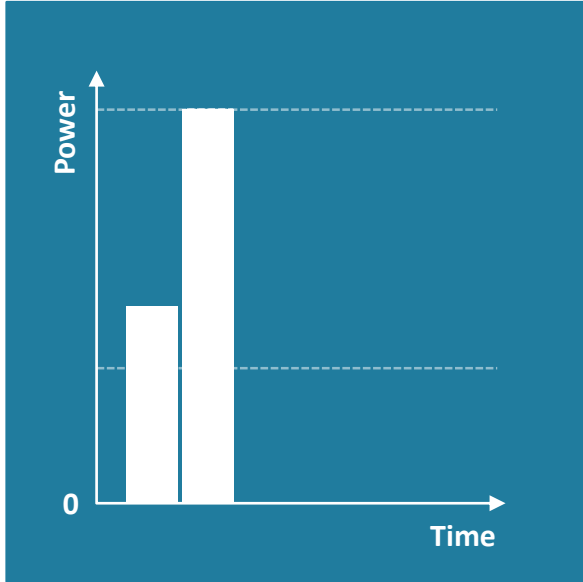
To make the energy market truly sustainable – green,
reliable and affordable- our system needs more flexibility.



Flexibility relieves system pressure:

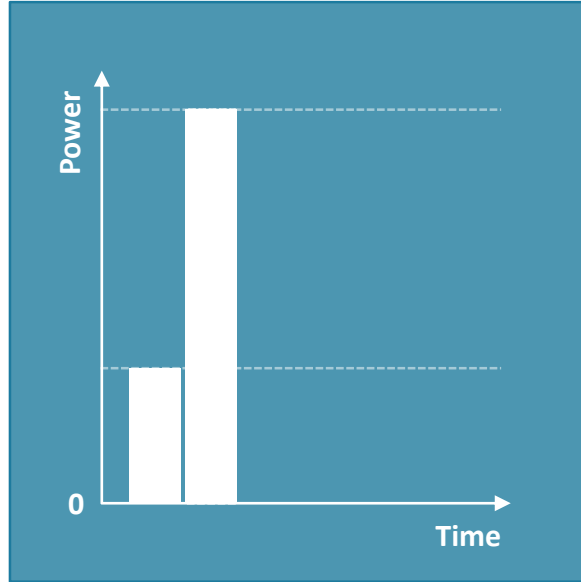
1.

Peak Shaving



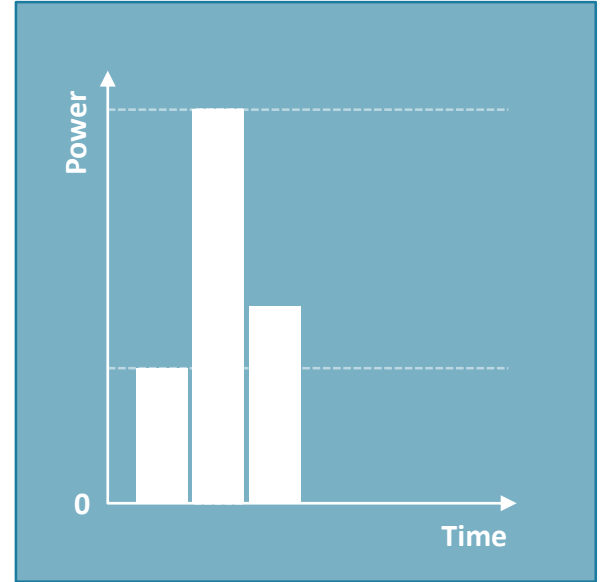
2.

Time Shifting



3.

Flexibility in Time and Amount





Residential flexibility



Heat pump



Solar



Electric Vehicle



Airco System

Business flexibility



Cooling/ heating systems



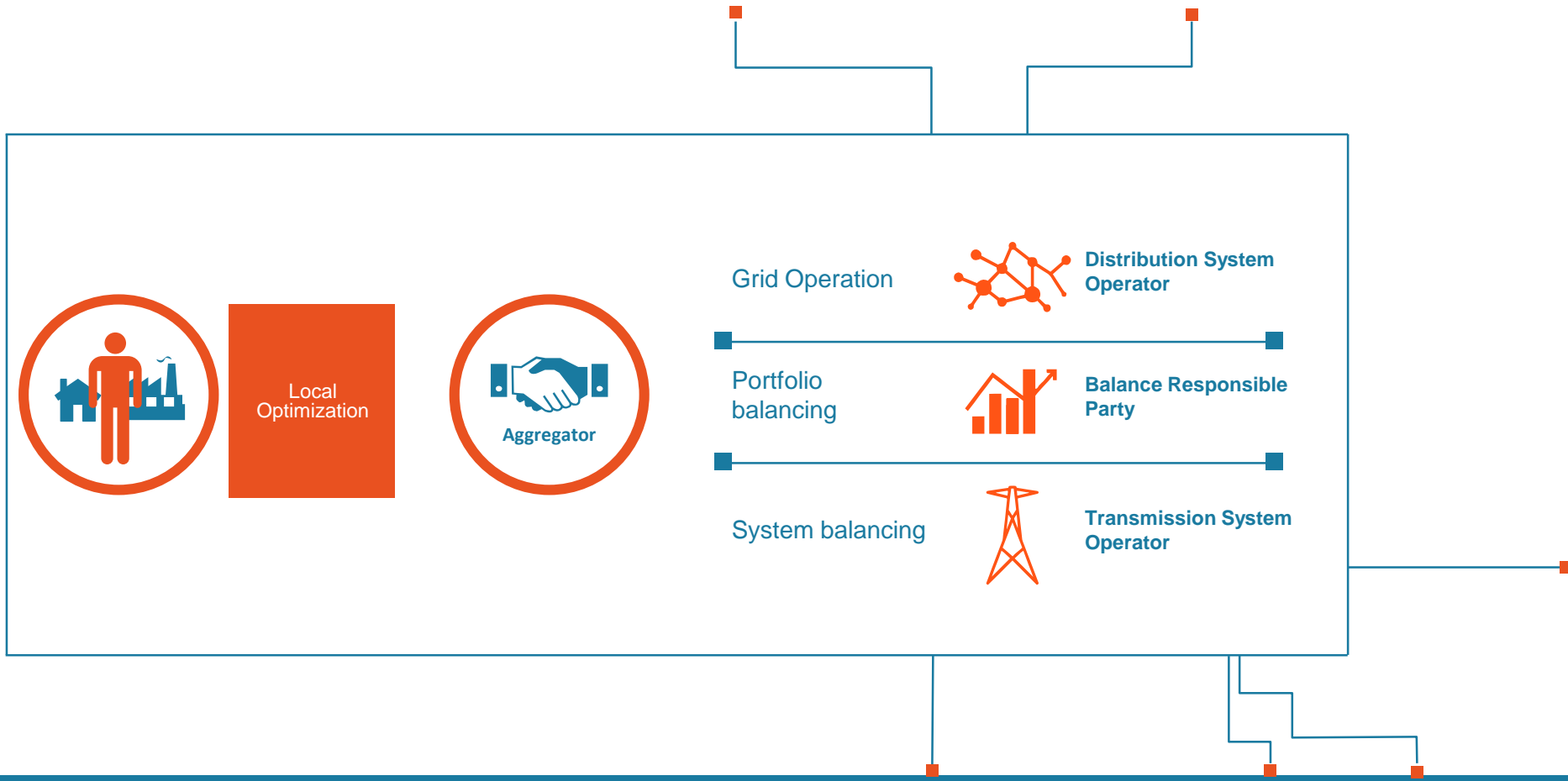
Emergency generators



Production process

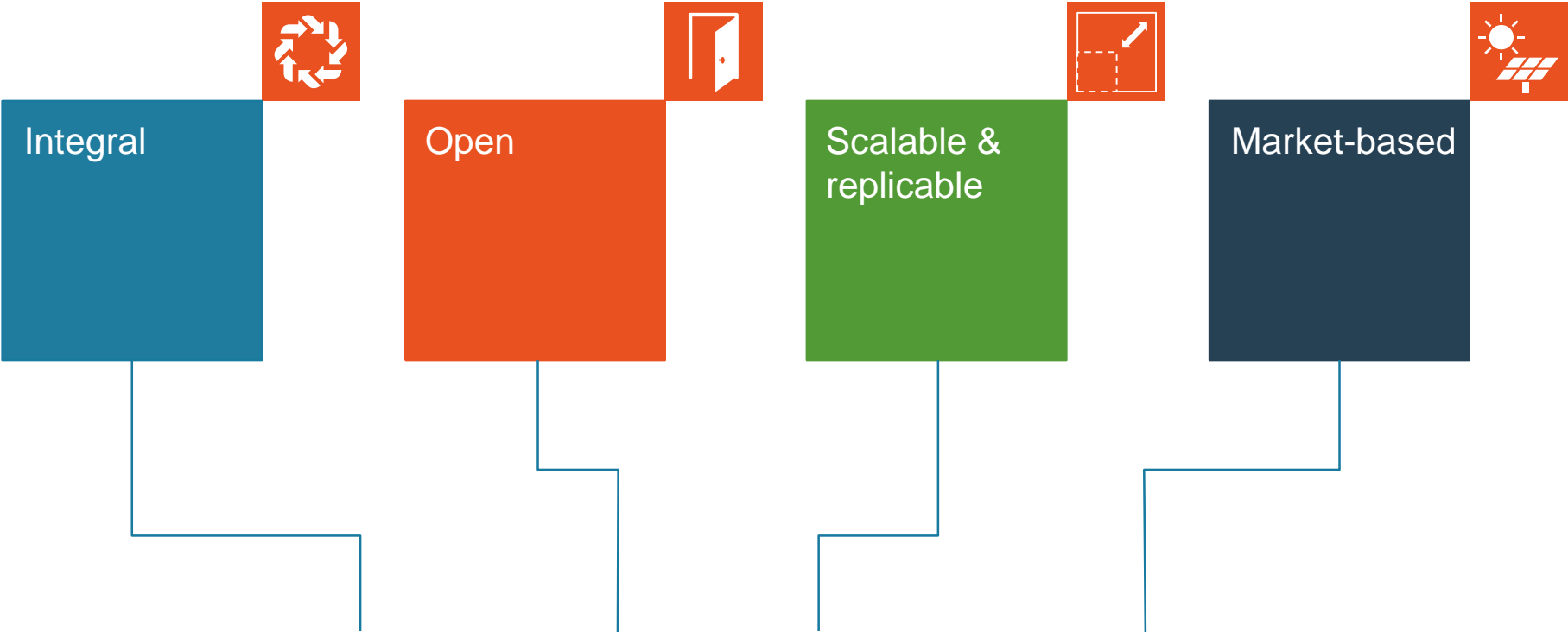


Aggregator





USEF design principles:



USEF describes the market for flexibility and provides free access to

A set of specifications,
designs and
implementation
guidelines

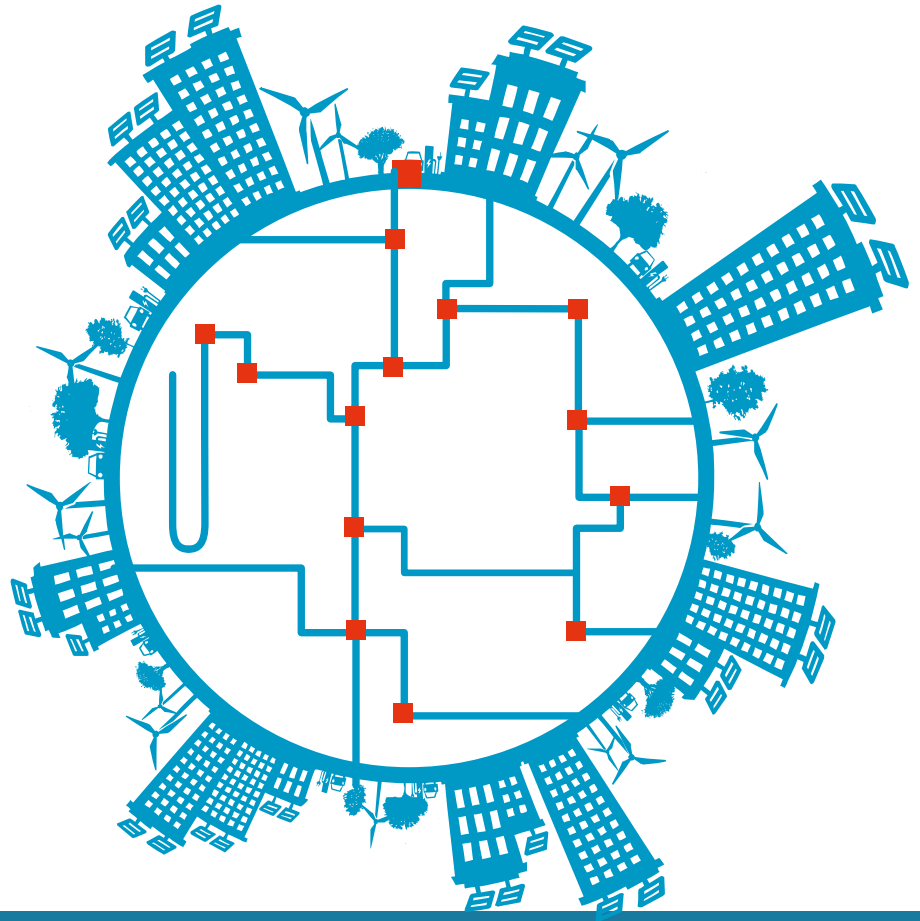
A reference
implementation to
accelerate large
scale deployments

Pilot results &
insights



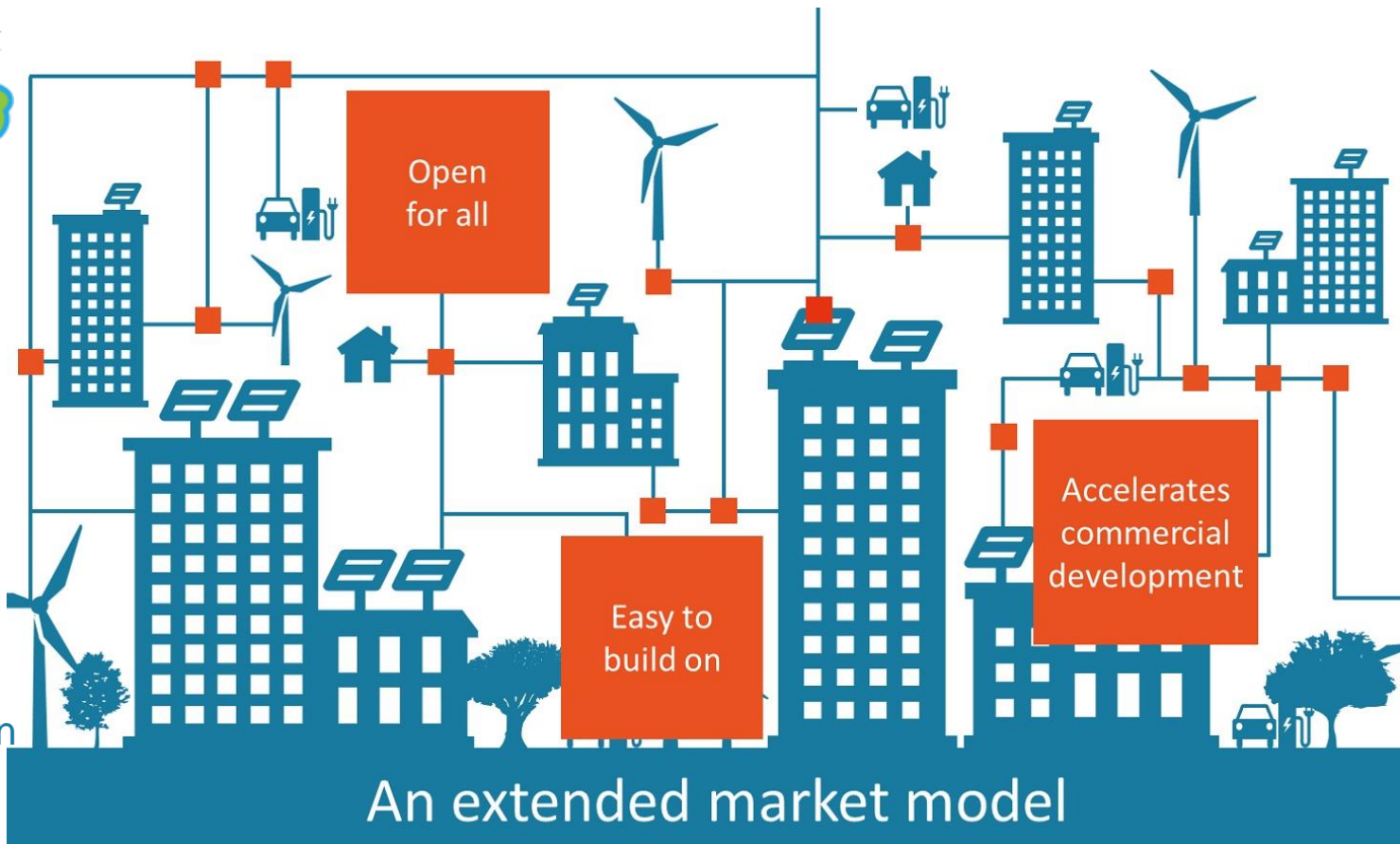
Fully implemented, USEF delivers all interaction process models, communication protocols and even exemplary coding to accelerate software development.

As a result, implementations accelerate, solutions are rapidly scalable and future connectability is ensured.



USEF can be adapted to fit different scenarios and markets.

The framework is already being applied to smart energy demonstration projects, like EnergieKoplopers in Heerhugowaard.



DSO Flex for residential consumers provides flexibility



Heerhugowaard

Live since 18 August 2015



Controllable household



Aggregator

flex €
flex €
flex €

Flex for
initial
correction

Balance
Responsible
Party

Flex to
prevent
congestion

Distribution
System
Operator

allliander

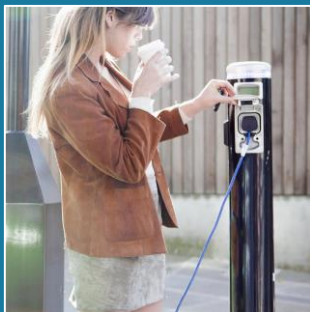


We believe that opening up an integral market for flexibility enables smarter solutions for energy exchange to the benefit of all in the system.

Plus, we believe that in order to create such a market, we need to work together, along one common standard, joining forces across roles and boundaries.

ONE INTEGRAL MARKET





Thank you



[@USEFsmartenergy](https://twitter.com/USEFsmartenergy)
www.usef.energy

**A solid
foundation for
smart energy
futures**



**SUSTAINABLE
PLACES
2016**
June 29-July 1, 2016
Anglet, France