



Universal Smart Energy Framework

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USEF Design Team

A solid foundation for
smart energy futures



FLEXIBILITY



Residential flexibility



Heat pump



Solar



Electric Vehicle



Airco System

Business flexibility



Cooling/ heating systems



Emergency generators



Production process

Value of flexibility goes beyond in-home or in-company optimisation:

Flexibility value chain



Local
Optimization



Aggregator

Distribution
System
Operator



- > Congestion management (D)
- > Voltage control

Balance
Responsible
Party



- > Hedging / portfolio adequacy
- > Self balancing / Passive balancing / export
- > Intraday market
- > Spot market

Transmission
System
Operator



- > Nat capacity market / strategic reserves
- > Primary control
- > Secondary control
- > Tertiary control
- > Congestion management (T)

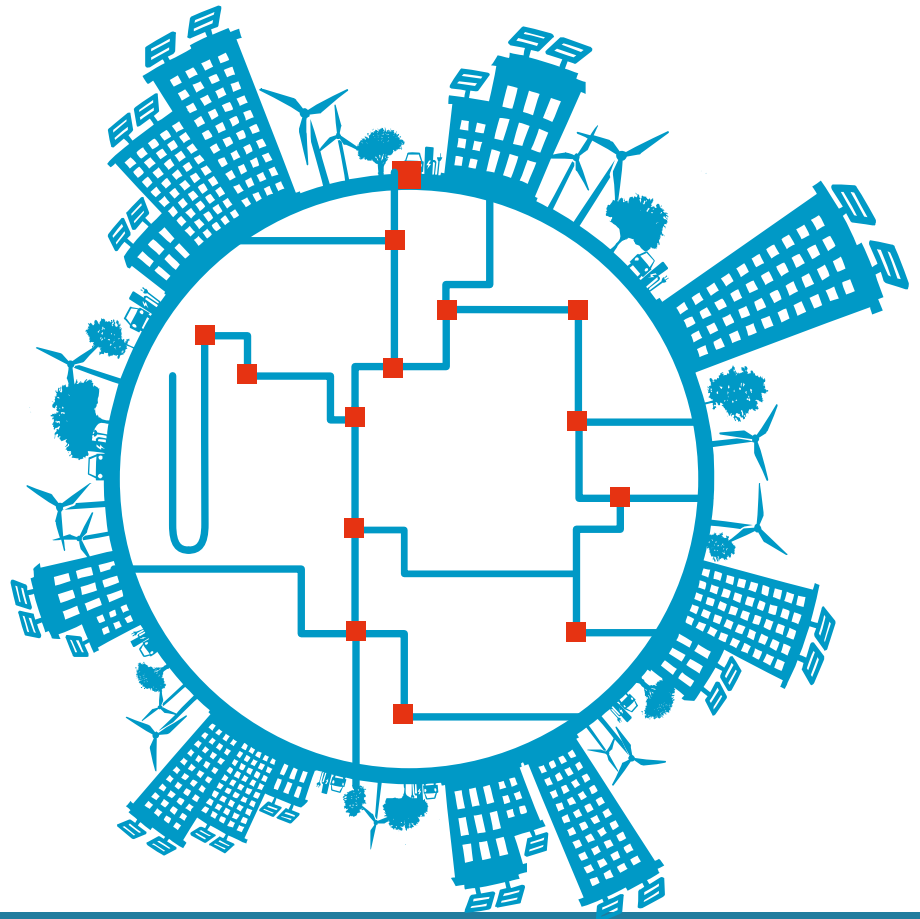
USEF connects new and existing markets and describes the interaction in a market with three variables



And the USEF framework describes new and existing market roles with their responsibilities and how they interact in this new extended market model.

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.



DSO Flex for the residential market 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



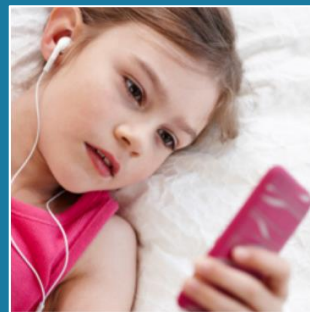
USEF describes the market for flexibility and provides free access to

A set of specifications,
designs and
implementation
guidelines

A reference
implementation to
accelerate large
scale deployments

Pilot results &
insights





Questions?

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foundation for
smart energy
futures**

