Universal Smart Energy Framework

Marijn de Koning
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

- **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:

- Wholesale Market
- Demand
- Supply
- Flexibility

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.
USEF implemented Balance Responsible Party Flex for imbalance correction Distribution System Operator Flex to prevent congestion

Live since 18 August 2015
A household provides about 0.5 kW controllable flex automatically

200 smart devices provide flexibility
Flex fees – no dynamic pricing

Each household provides about 0.5 kW controllable flex automatically
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?

Name: Marijn de Koning
Email: marijn.dekoning@usef.energy
www.usef.energy
Twitter: @USEFsmartenergy

A solid foundation for smart energy futures