Universal Smart Energy Framework

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A solid foundation for smart energy futures

USEF

Many different pilots are initiated, often focussing on very similar energy flexibility concepts.

We risk wasting time and money reinventing the wheel, or addressing incompatibility issues later.

USEF enables implementations to accelerate and scale rapidly and assures product connectability.

USEF delivers the market structure, the tools and the rules for energy flexibility trading.

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

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

Principles of the USEF Foundation

Distributed flex is activated in a **market based** approach

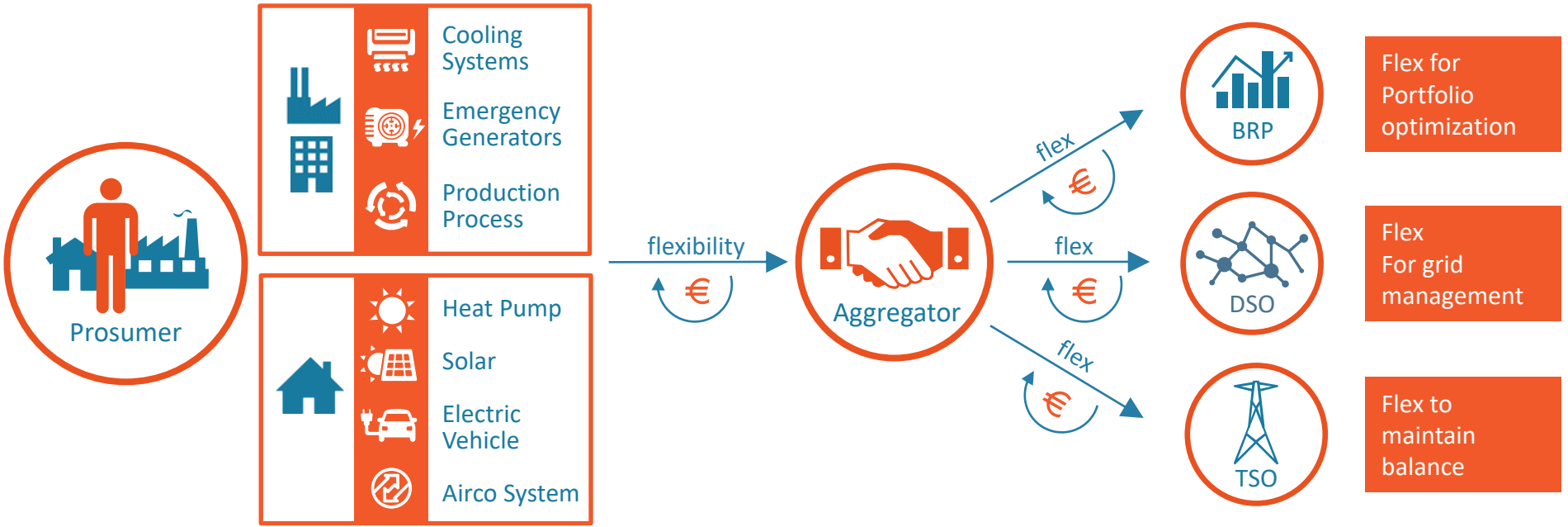
Facilitate **one overall** energy system – not one party

The **Aggregator** has a central role

Freedom of choice to participate in flex markets is guaranteed

Inter-operability between roles, and across borders

How is value created from flexibility? A central role for the **aggregator**



A key role to unlock the flexibility market

Aggregators exploit flex and maximize the **value** of flex for its customers

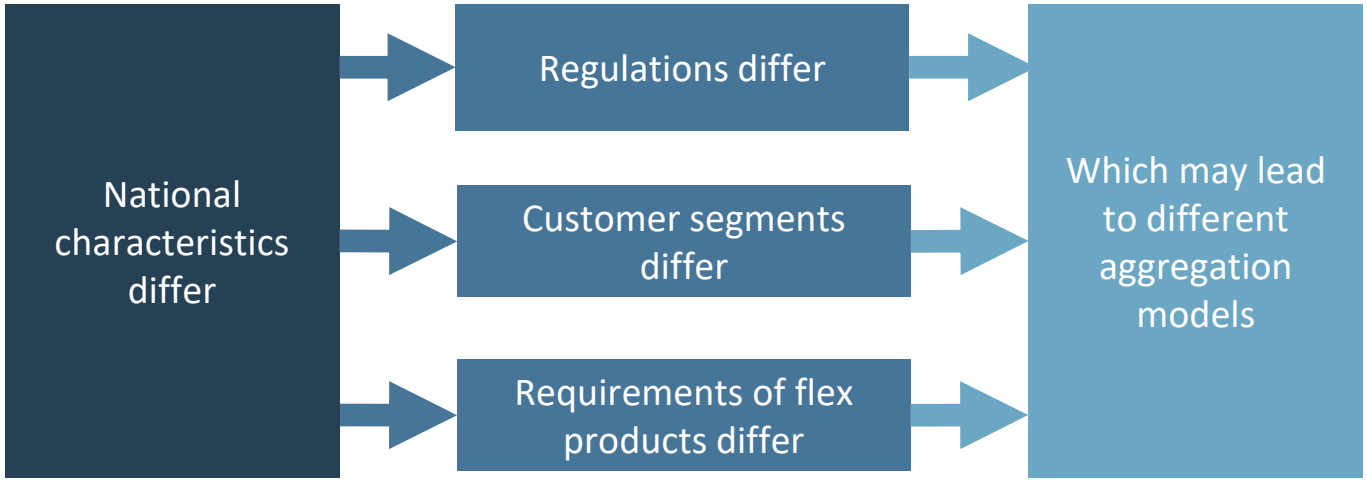
Aggregators **bundle small flex assets** into a **flexibility volume**

Aggregator enables (the trading of) **energy flexibility**

Aggregator is a **new market role** that can be taken by **existing market parties** (suppliers) and **new entrants**

Aggregators' role requires additional regulation

Towards a comprehensive set of models and solutions



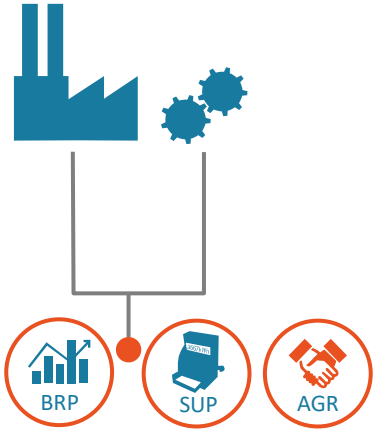
Joint approach is needed to meet EU harmonization efforts

Key questions for the independent aggregator

- How to separate flexibility from energy supply
- Who is responsible for the energy supply?
- Who is responsible for (im)balance?
- Is there a need for compensation towards supplier?

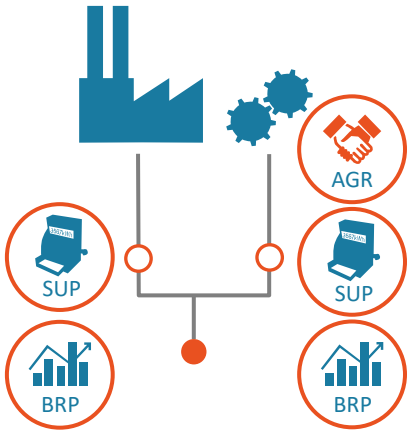
Aggregator implementation models

STANDARD AGGREGATOR MODEL



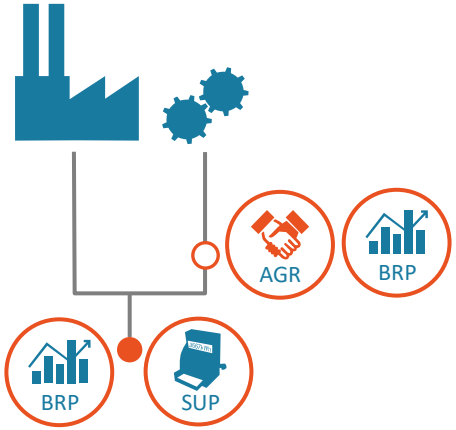
Integrated model, assuming a contractual relation between Aggregator, BRP and Supplier.

VIRTUAL TRANSFER POINT MODEL



Split of balance responsibility and supply through sub-metering.

FLEX-ONLY BALANCE RESPONSIBILITY MODEL



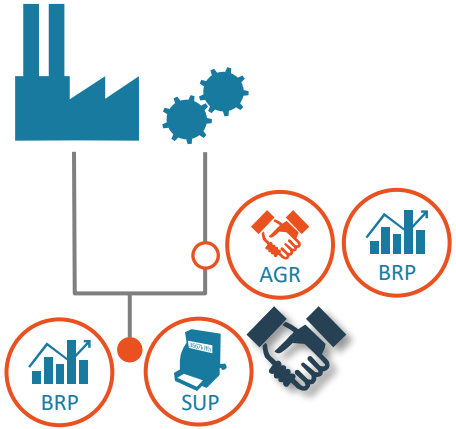
Dissociation of energy and flexibility. Aggregator only needs to assign balance responsibility for the flexibility, during times of activation.

Challenges of integrating explicit demand response

1. **Measurement and validation**
   Ensuring correct and trustworthy data
2. **Baseline methodology**
   Roles and responsibilities and appropriate baseline methodologies
3. **Information exchange and confidentiality**
   Finding a balance between transparency and confidentiality
4. **Transfer of energy price methodology**
   How to compensate the position of the Prosumer's supplier and its BRP
5. **Relationship between implicit and explicit DR**
   How to separate both impacts unambiguously
6. **Rebound effects**
   Who is responsible for the possible impact after a DR event
7. **Portfolio conditions**
   How to participate in TSO/DSO/BRP products through a portfolio

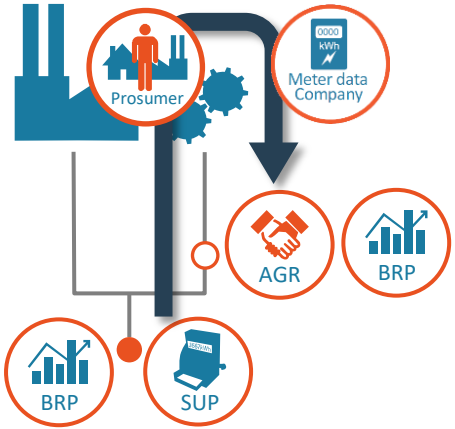
Transfer of Energy options

CONTRACTUAL



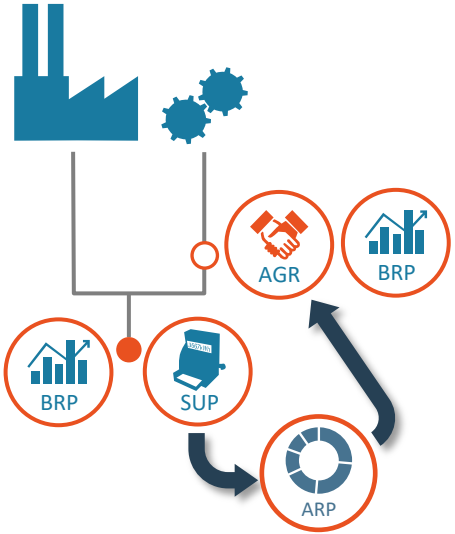
Contract between Aggregator and Supplier

CORRECTED



Supplier supplies to Prosumer, Prosumer to Aggregator

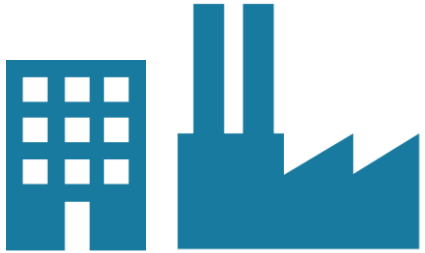
CENTRAL SETTLEMENT



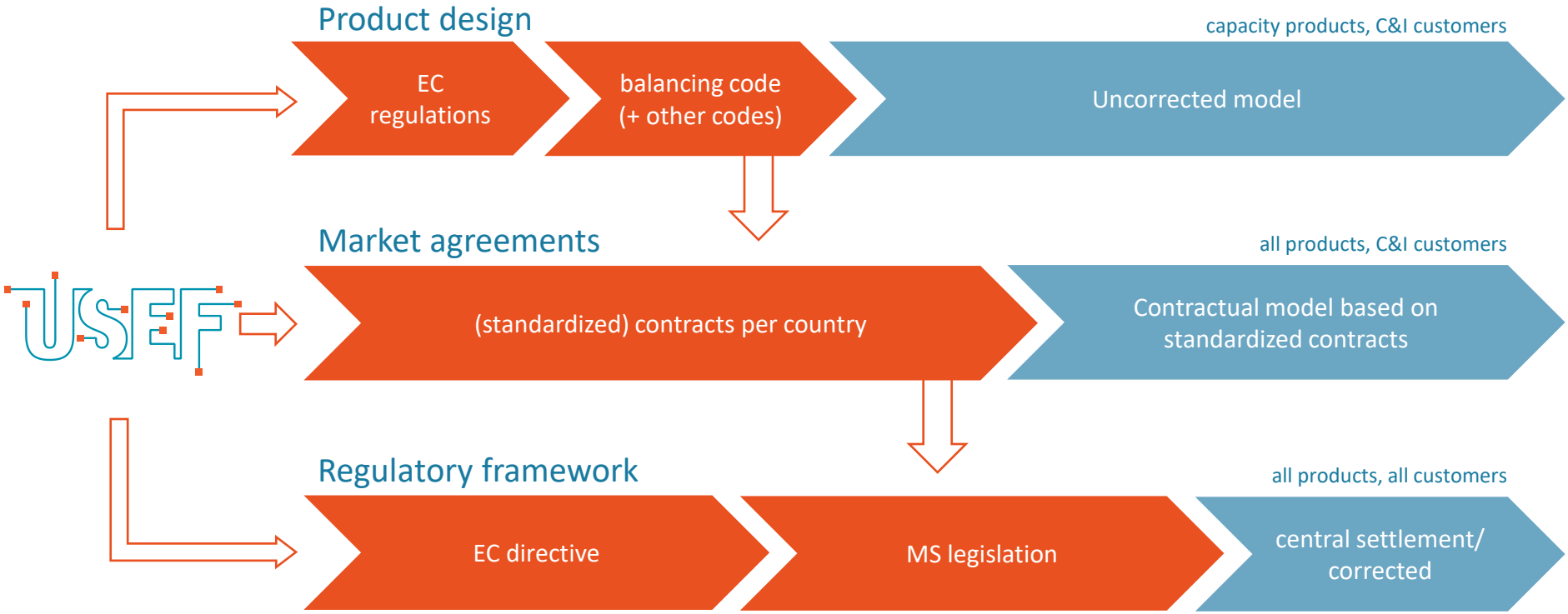
Energy transfer via Allocation Responsible Party

Differences between C&I and residential

- Amount of flexibility per asset
- Aggregator portfolio size
- residential assets are mainly load shifters with low marginal costs of activation
- Residential market more regulated

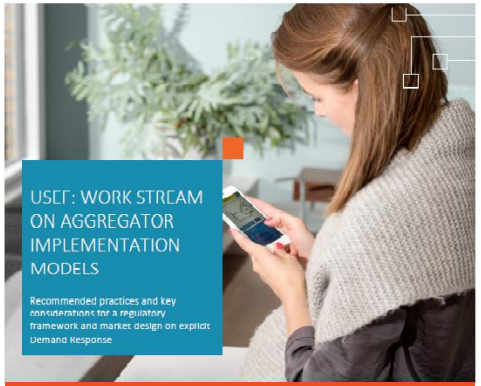


Demand Response roadmap



USEF Aggregator Workstream

AGGREGATOR IMPLEMENTATION MODELS - Recommended practices and key considerations for a regulatory framework and market design on explicit Demand Response.



update September 2017: includes residential customer segment




Questions?

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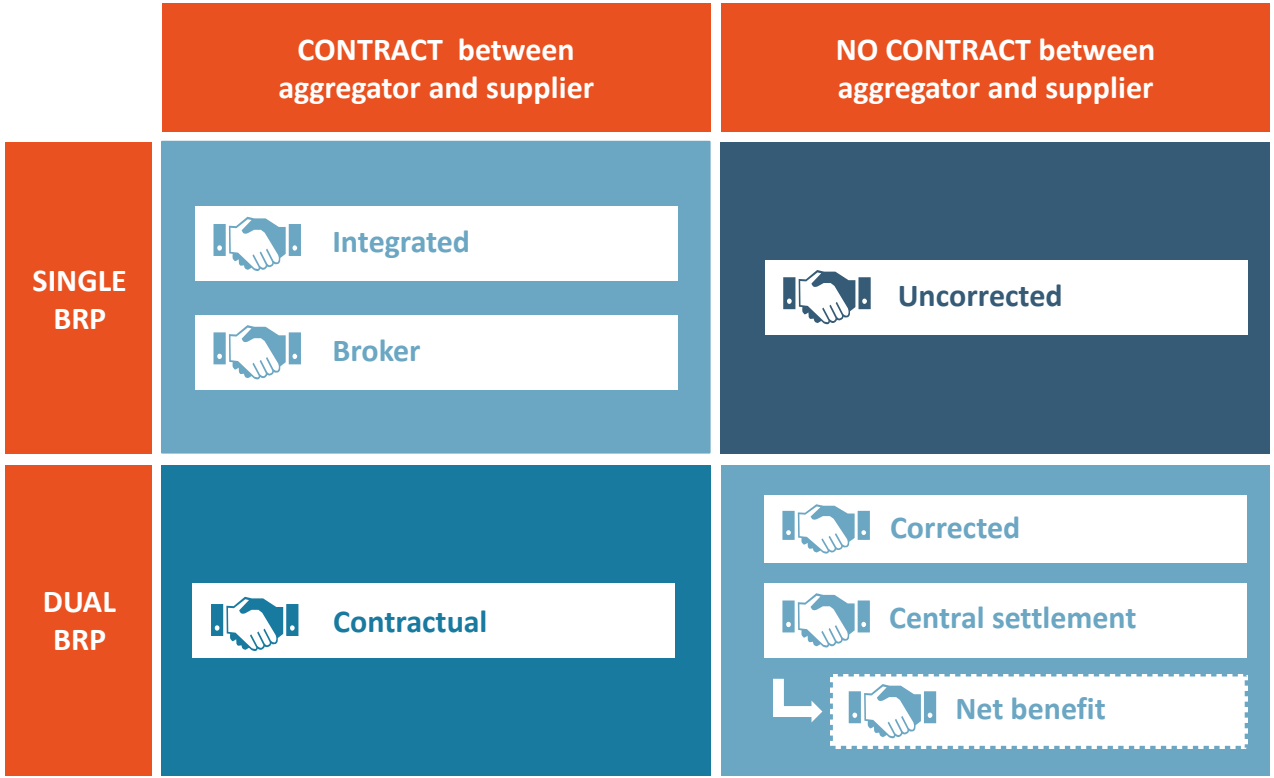
Aggregator Implementation Models



analysis by Aggregator Workstream

	different models	different flex products	different customer segments	different national regulations
7 different complexities	integrated broker contractual uncorrected corrected central settlement	primary control (FCR) secondary control (aFRR) tertiary control (RR) national capacity market/ strategic reserves congestion management spot market (day ahead trading) intraday trading self balancing, passive balancing hedging/portfolio adequacy	commercial industrial residential	DE BE DK NL …