



EXPEKTRA
Solutions for efficient energy systems

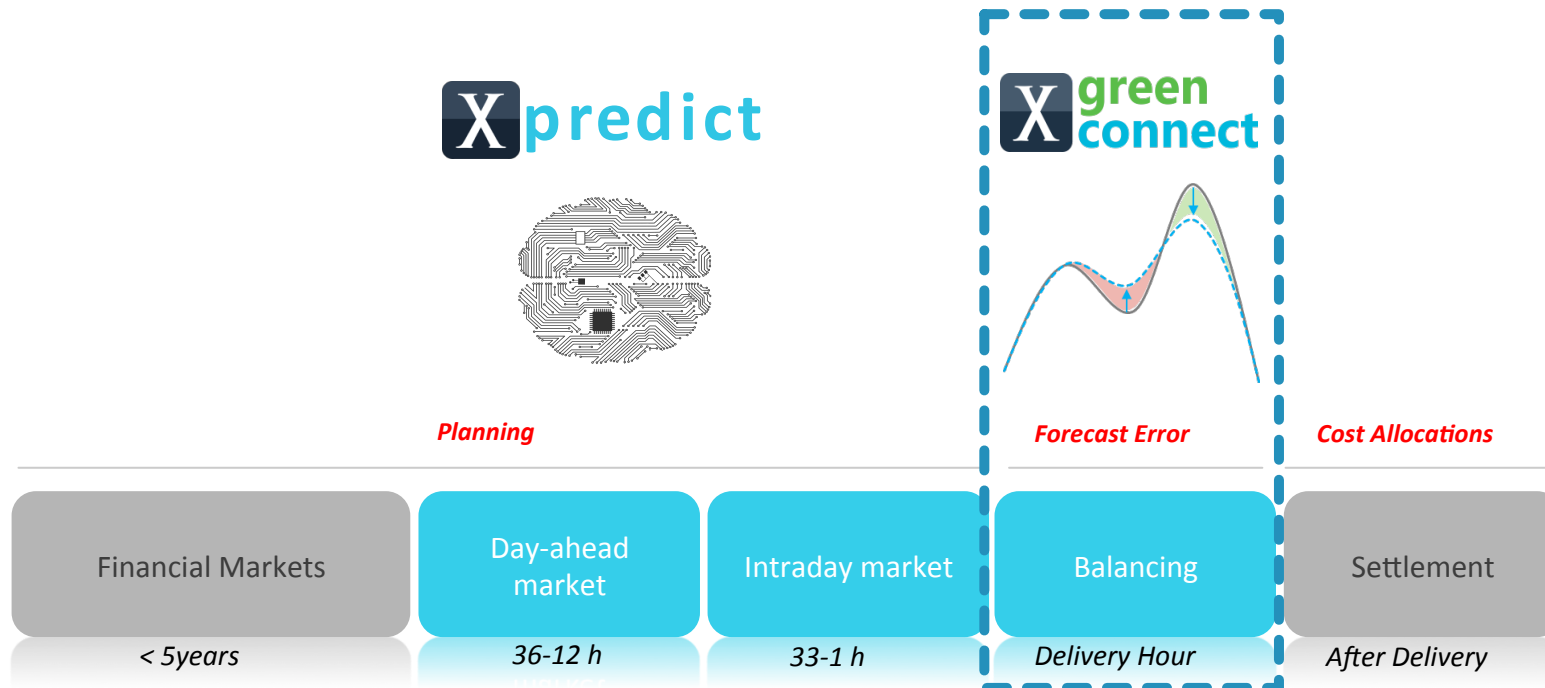
Industrial flexibility a new commodity?

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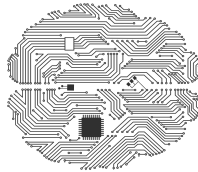
The balancing challenge



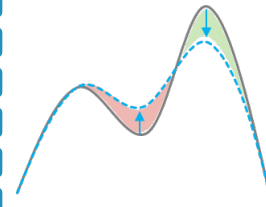
Expektra provides services for both efficient Planning and adjustment in Delivery stage



Xpredict



Xgreen connect



Xconsulting



Consumer flexibility – a new resource to support the energy system to be in balance!



Machines

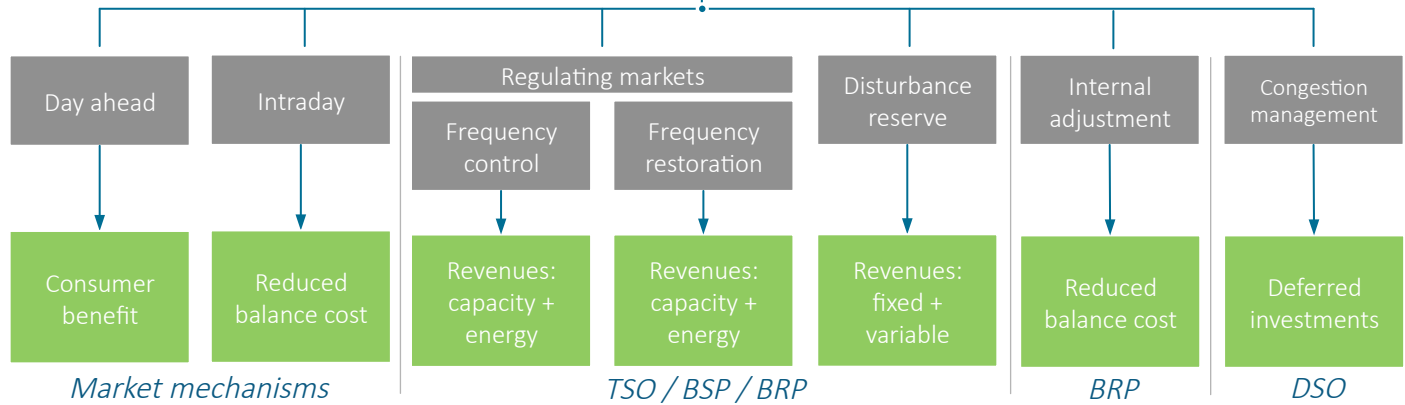
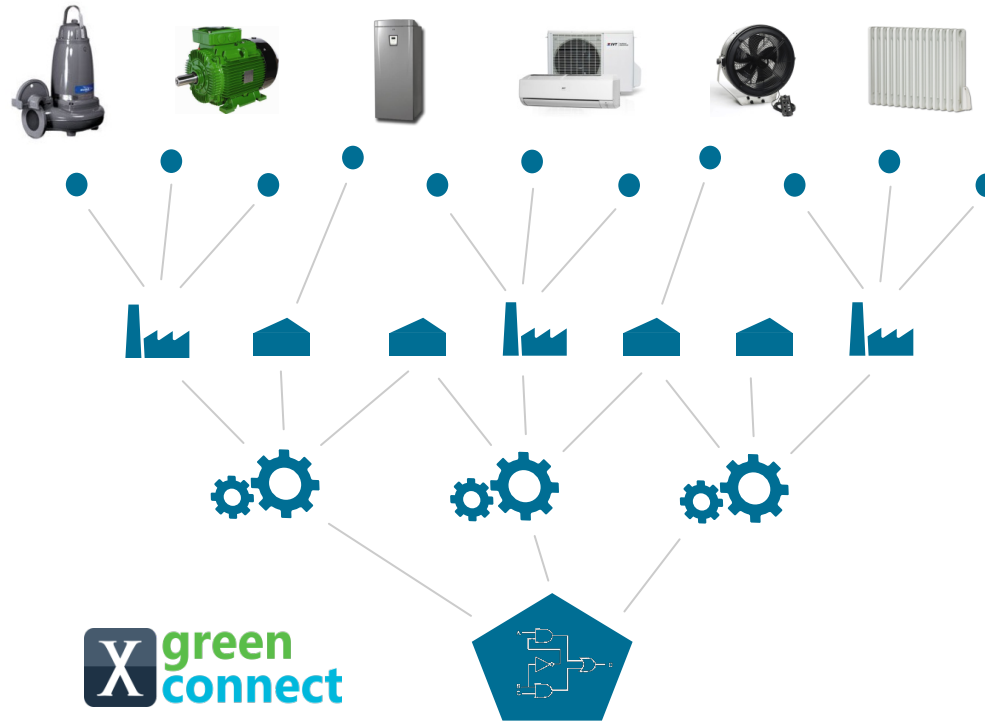
Sites

Technology providers

Aggregator

Applications

Benefits



Value of Consumer flexibility depends on characteristics of the resources (commodity structure)



Machines

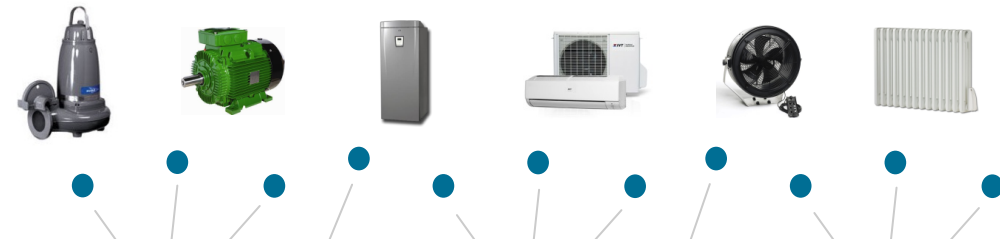
Sites

Technology providers

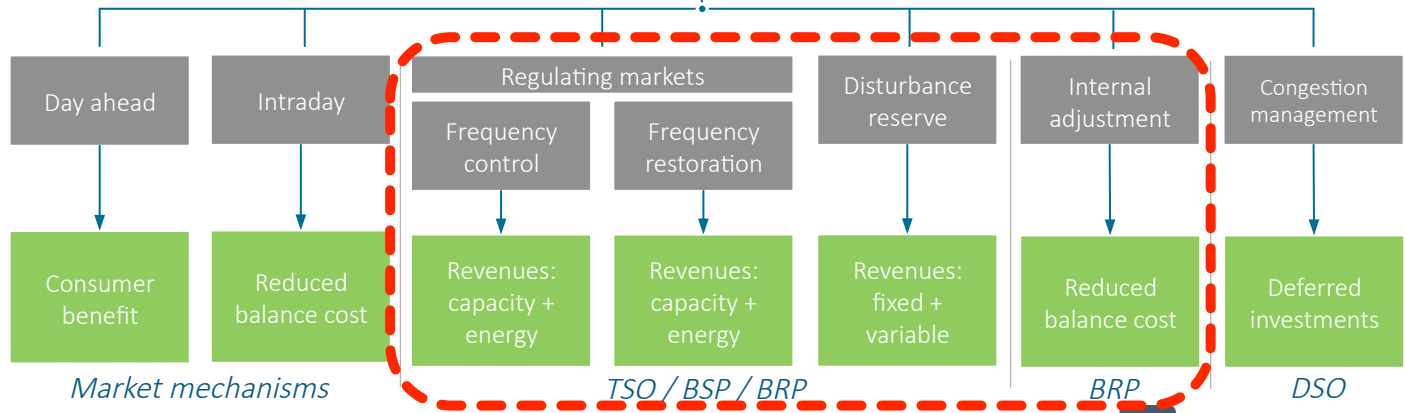
Aggregator

Applications

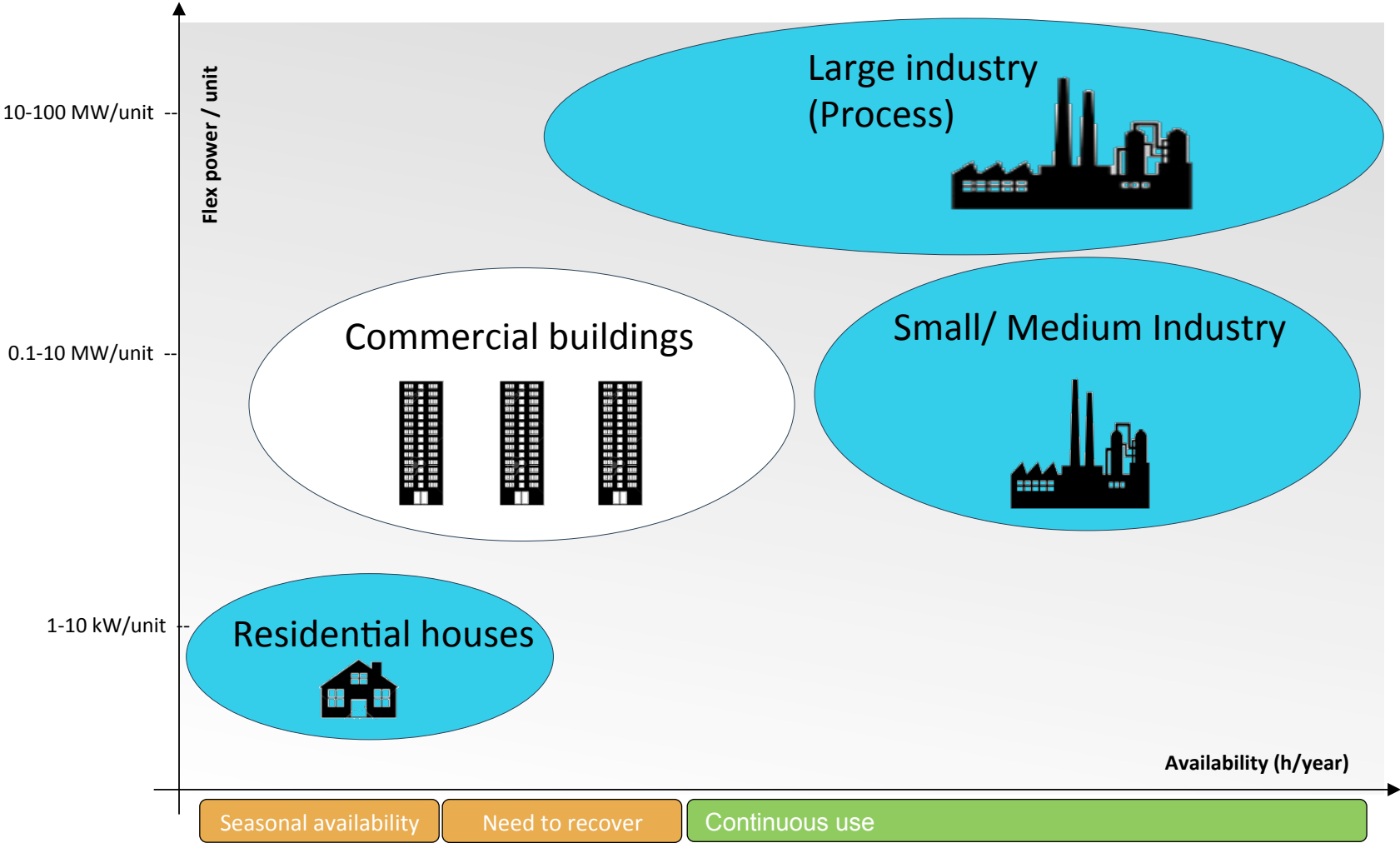
Benefits



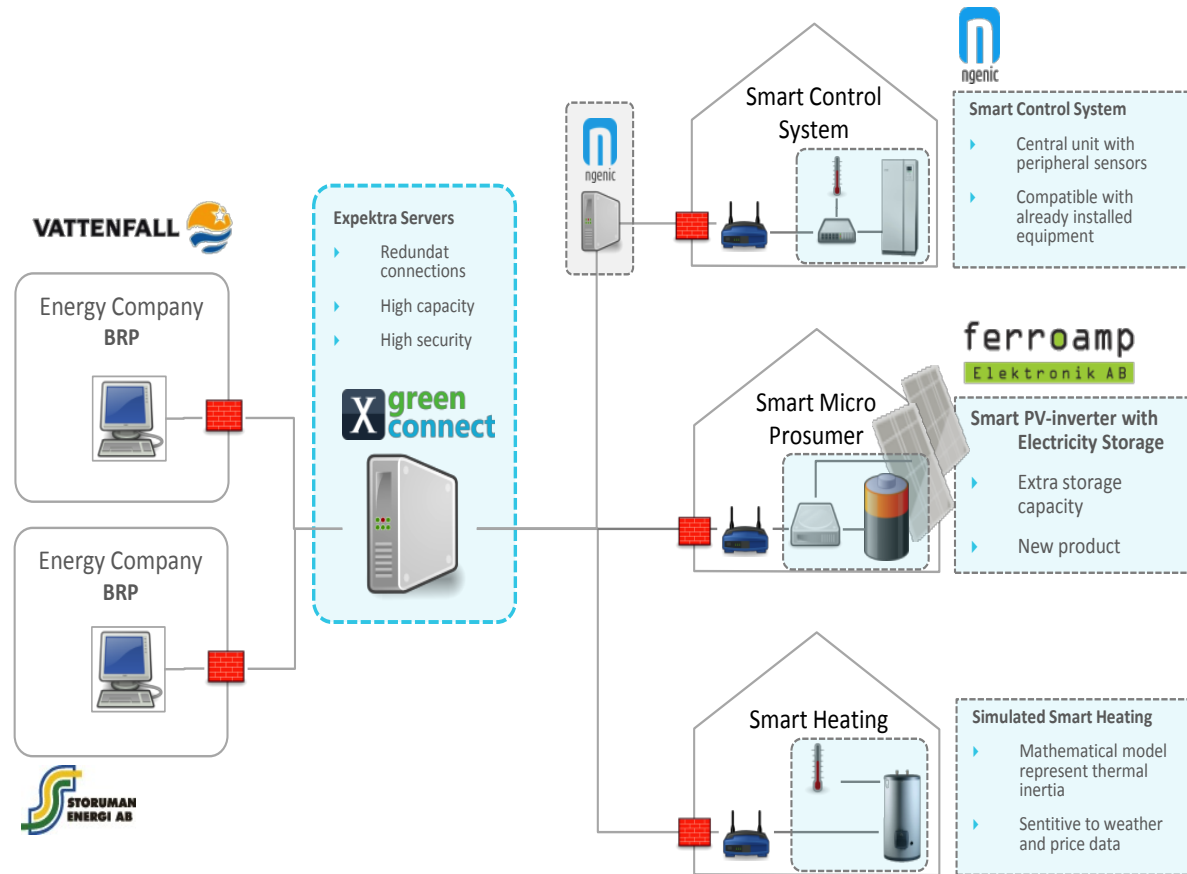
- ✓ Capacity
- ✓ Availability
- ✓ Response time
- ✓ Endurance
- ✓ Need for recovery
- ✓ Etc.



Expektra has experience from various projects and classifies resources according to size and availability (Structure of commodity)



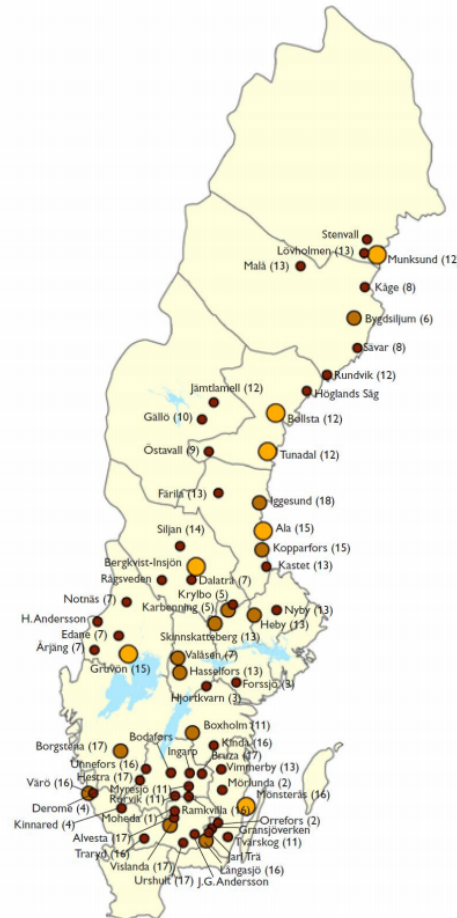
Technical pilot: residential applications – (2013/14)



- Develop solution to reduce imbalance cost for BRP
- Using flexibility in Smart control systems and electrical storage
- Automatic steering and optimization of process
- Involving nGenic, Ferroamp, Vattenfall, Storuman Energi

Conclusion: Limited commercial potential in residential applications, Difficult to generate significant volumes

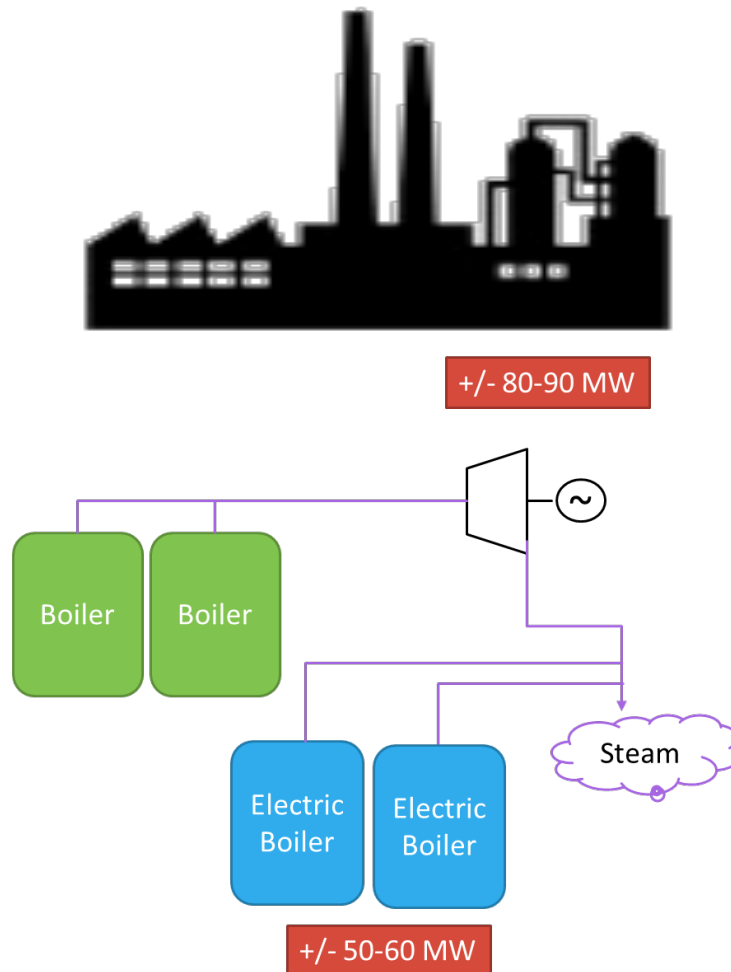
Commercial pilot: medium sized industry – wood drying (on hold 2015)



- Develop solution to deliver regulating power to TSO
- Using flexibility in industrial drying process (wood dryer)
- Automatic steering and optimization of process
- Involving Customer, Technology Provider, Balance Responsible, (TSO)

Conclusion: Interesting commercial potential but risk of business implications

Commercial pilot: Large process industry - steam system (On-going 2016)



- Develop solution to deliver regulating power to TSO and/or optimize grid tariff
- Analyzing potential in Steam generation process
- Verifying capabilities and managing business implications
- Commercially interesting potential

Initial observations: Interesting commercial potential and valuable for the system

Conclusions and next steps



- Automation necessary to create efficient solution
- Aggregating and Structuring makes flexibility available to defined “market”
- Involvement from TSO necessary (if flexibility should be delivered as balance power)
 - Reversed value chain (Customer owns the value)
 - Clarify and adjust roles and market structure
 - Adopt to new ways of working
 - Handle operational issues (min volumes, settlement etc)
- Experiences so far
 - Residential applications: low commercial value and limited system impact
 - Medium industries: positive business cases, some system impact, but must avoid business implications
 - Large industries: commercial potential and significant system impact. Go first!

Necessary to create “success stories” and proof of concept



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