Enhanced value creation through collaboration between utilities and market players

Annex 67 seminar on Flexible Energy Buildings, 4 April, Aalborg
Danish Intelligent Energy Alliance
Members

Member sectors:

- Energy and utility companies:
  - Electricity
  - Heat
  - Gas
  - Water and wastewater
- Municipalities
- Technology suppliers
- Advisors
- Universities
- Financial actors
- Research and knowledge institutions
Drivers for flexible prosumers in the energy markets
- a need to integrate intermittent renewable energy resources

Who will produce?
Who will consume more?
Who will consume less?
Who will deliver fast?

Helle Juhler-Verdoner, Managing director, The Danish Intelligent Energy Alliance
Electrification

40% increase in the distribution grid

The electricity consumption from the distribution grid

- Classic consumption
- Electricity to heat
- Electricity to transportation
- Increased consumption by 1 million electric cars
A roadmap for flexibility services

1. **Business model**
   - Volume increase!
   - (Transport, heat, buildings… with flexpotential)

2. **Infrastructure utilization**
   - and data access

3. **Value of flexibility**
   - (TSO and DSO)

4. **Market demand**
   - (product-design, regional demand)

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Developing flexibility products and services – combined value offer

*e.g. integrated meters, IT-interfaces etc.*
Increased volume – Market development

• The Energy Agreement in June 2018 lowered electricity-heat-tax permanently
• Government Climate proposal: 1 mio. EVs and plugg-in hybrids by 2030
• Treasury bill 2019: Elements providing a more stable framework for EVs
• Several initiatives about data access and digitalization
A roadmap for flexibility services

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(TSO and DSO)

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(product-design, regional demand)

Developing flexibility products
and services – combined value offer

*e.g. integrated meters, IT-interfaces etc.
MARKET MODELS
FOR AGGREGATORS
– Activation of flexibility (June 2017)

Source: Market Models for Aggregators (Danish Energy Association, Energinet, Danish Intelligent Energy Alliance and Di, June 2017)
MARKET MODELS FOR AGGREGATORS
- AHEAD OF COMPLIANCE WITH EU CLEAN ENERGY PACKAGE

Aggregators are defined in the market:

- Aggregators are defined in the market – preliminary as suppliers
  - Further developed to incl. AGG as SUPP on own components, using own submeters and IT-interfaces behind the DSO meter feeding data into the datahub. Tests are being initiated, spring 2019

- Still a need for more cases

- FCR no BRP-requirement
  - Tests are running since early 2019 with 4 cases

AGG using DSOs submeter (seriel meter with data in the data hub) Better terms of delivery etc. Submission in spring 2019
Multible data initiatives

- Data driving growth – government growth team recommendation
- Center Denmark, Flexible Energy Demand and Heat 4.0
- Energy Authorities effort to enhance Data utilization in Building
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Case: Is there sufficient capacity in the power grid on Solvej?

Electrification
Decentralizing
Technological development

Market trends are putting pressure on the capacity in the power distribution network.

Case: Residential street Solvej
Is there sufficient capacity in the grid?

Classic electricity consumption on Solvej (winter)

Max. load per hour [kW]
0 50 100 150 200 250
1 3 5 7 9 11 13 15 17 19 21 23
-50

- Single-family house without electric heating
- Max. capacity

New consumption on Solvej (winter)

Max. load per hour [kW]
0 100 200 300
1 3 5 7 9 11 13 15 17 19 21 23

- Electric car charging
- Heat pump

Max. load per hour [kW]
-50 0 50 100 150 200 250
1 3 5 7 9 11 13 15 17 19 21 23

- Electric car charging
- Heat pump
- Single-family house without electric heating

Solvej with solar panels (summer)
The complete solution to capacity challenges in the power distribution grid

Tools to solve future capacity challenges in the power grid

1. Renewal of the grid
2. Optimization via measurements
3. Activation of flexibility
4. Accelerated grid renewal

Development in the need for capacity... is driven by market trends
Rewarding flexibility in the future

- **Reward the consumer that helps the grid** through time-of-use tariffs and by rewarding “the location that helps”

- The **fixed element in the tariff model below 50%** but avoid to undermine electrification

- **Look at the combined price signal: Tariffs and grid connection fee**, terms for new technologies need to reflect the value they represent in the power grid

- **Customer categories** and appropriate behavior in relation to grid load: Time-of-use tariffs for ordinary customers and capacity tariffs for large industrial consumers

- **Fair tariffs no cross-price subsidization**
A roadmap for flexibility services

Business model Volume increase! (Transport, heat, buildings… with flexpotential)

Infrastructure utilization* and data access

Value of flexibility (TSO and DSO)

Market demand (product-design, regional demand)

Developing flexibility products and services – combined value offer

*e.g. integrated meters, IT-interfaces etc.
TSO balancing services – fair treatment of demand response

Product design and product terms in relation to TSO balance services

- **Volume** must be reduced. Bid-sizes need to be reduced further from 5MW to 1MW in The Regulating Power Market (FRR).
- **Duration** and number of coherent hours of flexibility need to be as low as possible.
- **The duration of the contract** has to be flexible (strategic reserves)
- **Symmetry demands** has to be removed.
- **The opportunity to pool** consumer and producer flexibility.
Danish DSO-flexibility trade to be developed

Tools to solve future capacity challenges in the power grid

1. Renewal of the grid
2. Optimization through meters
3. Activation of flexibility
4. Forced grid renewal

Tariffs

Development in need of distribution capacity...
...is driven by market tendencies

Time
A roadmap for flexibility services

Business model
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Getting the DK market ready and getting market players ready for the future demand

Source: SmartEN
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