The Flexibility Aggregator – the example of the GreenLys Project

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Ecometering Smart Energy Solutions
GDF Suez
• Customers are looking for Energy Efficiency Solutions:
  • Energy costs reduction
  • Competitiveness improvement

• Electric system needs new flexibility sources
  • Renewable power plant development → balancing needs for TSO, DSO and Producers
  • Peak consumption increasing
  • While, in the same time, former power plant down shutting

Consumers are a new source of flexibility for the electric system
Flexibility market
What are we talking about?

Electricity supply price depends on :
• The load curve shape
• The easiness to forecast the consumption at short term and mid-term. → risk premium and balancing costs

Electricity supply costs can be reduced in several ways :
• “Static” optimization : definitive distortion of the load curve shape by changing deeply the behavior of the customer
  • Energy efficiency
  • Time of use optimization
  • Load shedding

• “Dynamic” optimization = load management : punctual load curve distortion according to the economic conditions
  • Consumption distortion: anticipation and delay of consumption
  • Remote control distributed generation : CHP, Diesel engines

A site flexibility is its ability to punctually deform its consumption and/or its production according to an external solicitation (not linked to its usual business).
The Flexibility Aggregator buys and aggregates the flexibility of consumption (demand response) and distributed generation in order to value them on the market and through the transportation products (adjustment mechanism, capacity market). It contracts with end-customer directly or through an intermediate like an energy supplier.

In France, Parliament and Competition Authority made this player potentially independent from the energy supplier.
Flexibility is not an end – GDF Suez aims is about Energy Efficiency

- Necessity to address the customers expectations and needs
  - Global approach of their needs
  - Expertise and simplicity
  - Visibility

- Flexibility is only a part of a full packaged offering around energy efficiency
  - Energy audit
  - Solutions proposal for static and dynamic optimization considering technical and economical constraints
  - A global technical solution answering all needs
    - Consumption monitoring
    - Energy management
    - Remote control and scheduling
    - Flexibility monetization
  - Operation and maintenance of the solution
Flexibility market is more and more addressed

Four main clusters have been identified with complementary value for electric system

Cluster 1
CHP - Diesel Engine
High Activation Costs
Automation possible
Load shedding on very few occasions (e.g. 4-5 times a year)
Quick start up and long duration
Mature

Cluster 2
Core Process
High Opportunity Costs
No automation needs
Load shifting on few occasions (e.g. 20 times a year)
Load shifting within the day
Long start up time and long duration
Developing

Cluster 3
Industrial processes with various-sized buffers
Low Opportunity Costs
Automation possible
Load shifting within the day
Quick start up time and short duration

Cluster 4
Office & Housing Uses: HVAC, water heating
Low Opportunity Costs
Automation needed
Load shifting, often, quick and recovered the next hour
Quick start up time and very short duration
New field
GDF Suez is addressing several European countries as Energy and Services Supplier

GDF Suez developed its portfolio on clusters 1, 2 and 3.

UK, France and Belgium are the more developed countries concerning the flexibility offerings

- First developments through different programs or tenders from TSO
- New development coming through market value (intraday and day-ahead)
- Profitability remains difficult to reach and uncertain

Additional value is expected in the future from Capacity Market and from DSO needs
A need for a global approach field test: GreenLys

Several questions are pending to further develop the market:

- How demand side management can help the grid to host more distributed generation especially when they are intermittent?
- What is the value which is brought to the DSO today and in the future?
- What kind of technical relationships should appear between DSO and Aggregator?
- How can we package offerings for cluster 4 customers?

GreenLys has been designed to answer those questions
**GreenLys: a field test designed to prepare cluster 4 development**

**Aims**

- Develop 2 field test platforms on Grenoble and Lyon by 2016: 500 B2C customers and 20 B2B customers on each
- Test the social acceptance and the offerings attractiveness
- Test in real conditions the relationships between distributed generation and Demand Side Management
- Propose regulatory evolutions in order to let DSM create the maximum value for the electric system
GreenLys first results for Aggregator

Customer interest for packaged offerings especially with gamification and challenges within the users community

Load shifting has almost no impact on B2C customers comfort (3-5% curtailment cancelled by customers)

The load shift can be managed but it has a cost for the aggregator. Hence a regulatory frame is needed (economic incentive)
Next steps for 2014

Relationship between DSO and Aggregator to be further design

• What kind of studies should be performed before the portfolio development?
• What kind of information should be exchanged?
• What would be the economical consequence if the DSO refuses a curtailment?

What is the flexibility value for the DSO

• Grid reinforcement reduction \(\rightarrow\) how to ensure the need reduction on the long term? How to induce the DSO to avoid reinforcement when DSM could be enough?
• OPEX reduction especially the technical losses to be assessed with a standard methodology \(\rightarrow\) How should evolve the distribution charging in order to explicit the flexibility value and induce DSM development at the right location?
Thank you!