Demand Side Management in France

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Frédéric Galmiche
Markets Department
Business case for DSM – a simplification

Emergency DSM (low fixed cost, high marginal costs)

Energy savings /optimisation
DSM (high fixed cost, low marginal cost when equipped)

Value

~ Industrials

~ Some industrials (when pooled), households

DSM is often thought only to correspond to « emergency » solutions (and there is a large potential for it).

Yet, with the roll out of new technologies, new players emerge with different business cases and more economic solutions, which means that DSM may become a credible alternative to generation in some cases (energy value)

→ There must be a dedicated framework (market design / regulatory provisions)
Different stages in market design

**Stage 1: specific arrangements in old-style regulatory regime**
- Predefined tariffs (even when dynamic)
- Specific products providing little flexibility (D-1 signals, no RT action)

**Stage 2: DSM-compatible market design**
- DSM participation authorized in markets
- Adapted governance framework to enable the participation of independent DSM Operator
- Specific products tailored to enable DSM participation in all markets (but with equal conditions to other products)

**Stage 3: DSM-friendly market design**
- DSM participation authorized in markets
- Adapted governance framework to enable the participation of independent DSM Operator
- Specific products tailored to enable DSM participation in all markets (but with equal conditions to other products)

**Stage 4: Public support for DSM in market design**
- Support schemes

**Full participation of demand-side is needed to reflect all the components of its value (EC, 2013)**

**Implementation in the French market design**

<table>
<thead>
<tr>
<th>Energy</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balancing markets open to DSM</td>
<td>Reserves / AS procurement open to DSM</td>
</tr>
<tr>
<td>Direct valuation in energy markets</td>
<td>Capacity certificates for DSM</td>
</tr>
<tr>
<td>Portfolio optimization for suppliers (sourcing vs sales)</td>
<td>DSM reduces individual contribution to SoS</td>
</tr>
</tbody>
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Demand Side Integration

01. Balancing & Reserves

02. Capacity Market

03. Energy Market
1 BALANCING & RESERVES
The French Balancing Mechanism

Reserves Procurement

- Open & Permanent Call for tenders for Energy Balancing offers
  - Compulsory participation for Generation (implicit offers)

  Contracted availability on the Balancing Mechanism for specific products
  - « Fast reserves » (FRR) & « Complementary reserves » (RR)
  - Demand Response guaranteed availability
    - Brittany experimentation (local reserves)
    - Interruptibility

Balancing Activation

- Generation = Consumption
- Reserves replacement (FRR+RR)
- Ancillary Services replacement (FCR+FRR)
- Congestion Management

NB: limited volume of contracted balancing reserves in France (1.5 GW) compared with Germany (~2.5 GW)
Balancing Activation

Industrial Consumers have been fully integrated since 2003

Aggregated load Balancing experiment since 2007
## Contracted Availability

<table>
<thead>
<tr>
<th>Product</th>
<th>DSM Capacity</th>
<th>Cost</th>
<th>Conditions</th>
<th>DSM Status</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FRR &amp; RR</strong></td>
<td>Around 100 MW out of 1500 MW</td>
<td>~ 50/60 M€ for 1500 MW</td>
<td>Activation &lt; 15 / 30 mn 365 days, max twice a day</td>
<td><strong>Contracted</strong></td>
</tr>
<tr>
<td><strong>DSM availability</strong></td>
<td></td>
<td>~ 10/15 M€</td>
<td>Activation &lt; 2h 20 days, 1 to 4 times a day</td>
<td><strong>Exclusive</strong></td>
</tr>
<tr>
<td><strong>Brittany</strong></td>
<td>66 MW</td>
<td>&lt; 2 M€</td>
<td>Activation &lt; 14h 20 days, twice a day</td>
<td><strong>Contracted</strong></td>
</tr>
<tr>
<td><strong>Interruptibility</strong></td>
<td>400 MW</td>
<td>~ 12 M€</td>
<td>Activation &lt; 5 s Max 10 times / year for 1h</td>
<td><strong>Exclusive</strong></td>
</tr>
</tbody>
</table>
CAPACITY MARKET
The French Capacity Market is a capacity obligation:
- Capacity wide
- Technology neutral
- No capacity target
- Decentralized market
- Forward looking
- No public money

The French Capacity Market is intended to boost DSM contribution to peak shaving, and has been supported by DSM players.

$\text{Prices reflecting SoS needs}$

$\text{Security of Supply criterion}$

$\text{Suppliers Obligations (based on consumption forecasts)}$

$\text{Capacities (generation & demand response)}$

$\text{Certification process}$

$\text{DR compatible}$

$\text{Offer of certificates}$

$\text{Reliability Commitment}$

$\text{Demand for certificates}$

$\text{Foreign capacities contribution to SoS}$

$\text{Transparent methodology}$

$\text{DR exclusive}$
Demand Response contribution to Security of Supply
2 possibilities in the French Capacity Market

**Explicit participation through certification**
- Certification process similar to generation
- Requires a correction of load to avoid double counting

*Well adapted to « easily certified » DR*

**Implicit participation through obligation reduction**
- No certification
- No load correction

Suppliers can hedge with DSM

*Well adapted for difficult to assess DR, or energy savings*

Participation Method chosen by DR owner
DSM role in the Capacity Market

Capacity Market Timeline

- 3 years

Generation certification

« DSM playground »

Delivery period

**DSM short implementation time**

During the 3 years of Capacity Market operation before the delivery period, new (and unplanned) capacities will be DSM

→ DSM should set the price in practice
ENERGY MARKET
Portfolio Optimization

Peak pricing experience in France

- **Peak/offpeak tariffs**
- Predetermined prices/hours
- Automated response
  (water heaters activation)

- **Peak day tariffs (EJP, Tempo)**
  EJP: 22 days/year, prices x5 to x10, D-1 activation (SMS,...)
  Decreasing capacity: 6.5 GW → 2.4 GW
  Locational activation possible

Up to 3% of national peak load reduction
Who should be in charge of DSM?

**Suppliers in charge of DSM?**
- Limited use for portfolio optimization
- Suppliers’ core business is to sell energy
  → Limited incentives to develop DSM except for portfolio optimisation

**Consumers in charge of DSM?**
- High transaction costs, especially for small consumers (residential load)
  → Consumers are generally not willing to do it themselves (except for extreme prices)

There is room for a new type of market party, the Independent DSM Operator

Requirements

- Open access to demand side potential
- Open (explicit) access to markets
Challenges & solutions

Trust in the product
Definition / Control

Technical issues
Metering / Aggregation possibilities...

Open Competition
Adapted governance framework

Smooth interactions in the market
Neutralization of imbalances

Free access to DSM potential
Supplier compensation

Potentially conflicting
Can there be a fair compensation without conditional access to DSM potential?

Bilateral contracts
DSM Operator / Supplier

Regulated third party access & compensation

This solution could result in Suppliers restricting access to their consumers

Recommended by the French Competition Authority
Proof of concept

This concept is being experimented in France (NEBEF project)

Full implementation will integrate a support scheme for DSM
(bonus for each activation)

TSO intermediation ensures commercial confidentiality
Conclusions

• Demand Side Management is central in the energy policy in France, with **strong political support** (« Brottes law »).

• The **potential for Demand Response is high**: Stakeholders evaluate the potential capacity to several GW (aggregated & industrial).

• Demand Response development requires **full participation** to all aspects of the market design.

• **Social welfare gains** from energy market integration estimated at 10 to 50 M€/year

• **Challenges**:
  - Assessment, certification, performance monitoring
  - Data management: commercial confidentiality & privacy protection
  - Dealing with Load shifting (operational & market design considerations)
  - Regulatory framework: Economic parameters determination
APPENDIX
DSM definition

« in reaction to an external signal, reduction of the electricity withdrawal at a node of the network during a defined duration, resulting from a modification in the behaviour of a consumer »

(Stakeholders working group on DSM valuation)