Market price of electricity

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Commission de régulation de l’énergie

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Overview of French electricity markets

Role of CRE, the French National Regulatory Authority (NRA)

Regulated tariffs (TRVE) and market price offers: coverage of costs and contestability

Evolution of the key components of the electricity bill

Wholesale market price trends
Electricity markets include:

- **A wholesale market**: producers, traders, suppliers, etc… are buy and sell electricity on the spot market and on the futures market. Prices are set according to the supply/demand balance on an hourly basis.

- **A retail market**: suppliers are in competition to provide end users with electricity. Each client has a choice between a contract under regulated tariff (offered by incumbent suppliers only) and a contract at market price (offered by all suppliers).

**ARENH** is a mechanism aiming at enhancing competition on the retail market:

- alternative suppliers have a right to purchase electricity from nuclear plant from EDF at a regulated price (42 €/MWh in 2013), only to supply end customers located in France.

- A maximum of 100 TWh per year can be purchased.

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**Energy flows between French wholesale electricity market upstream and downstream segments in 2012**

<table>
<thead>
<tr>
<th>Wholesale market</th>
<th>Retail market</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generation (excluding VPPs and ARENH) 452 TWh</td>
<td>End-user consumption 460 TWh including:</td>
</tr>
<tr>
<td>- VPP generation 28 TWh</td>
<td>- customers at regulated tariffs</td>
</tr>
<tr>
<td>- Imports 29 TWh</td>
<td>- customers at market prices</td>
</tr>
<tr>
<td>- Exports 74 TWh</td>
<td>- self consumption</td>
</tr>
<tr>
<td>- Grid losses purchased on markets 36 TWh</td>
<td>- pumping</td>
</tr>
<tr>
<td><strong>Transactions on the intermediated market:</strong> 578 TWh (538 TWh)</td>
<td><strong>[35 TWh]</strong></td>
</tr>
<tr>
<td>Physical nominations related to contracts executed on the wholesale market: 360 TWh (2011 TWh)</td>
<td><strong>[451 TWh]</strong></td>
</tr>
</tbody>
</table>

Données : RTE – Analyse : CRE
Overview of French electricity markets
Regulated tariff vs market price-offers

Share of the total number of sites according to the type of tariff, end of June 2013

- **Grands sites non résidentiels** (41,000 sites): 10% new entrants', 95% incumbent's market price offers, 5% incumbent's regulated tariff
- **Sites moyens non résidentiels** (437,000 sites): 6% new entrants', 85% incumbent's market price offers, 9% incumbent's regulated tariff
- **Petits sites non résidentiels** (4,4 M sites): 0% new entrants', 93% incumbent's market price offers, 7% incumbent's regulated tariff
- **Résidentiels** (30.9 M sites): 1% new entrants', 92% incumbent's market price offers, 7% incumbent's regulated tariff
- **Tous sites** (35.9 M sites): 6% new entrants', 84% incumbent's market price offers, 9% incumbent's regulated tariff

Share of the total consumption according to the type of tariff, end of June 2013

- **Grands sites non résidentiels** (181 TWh): 38% new entrants', 5% incumbent's market price offers, 85% incumbent's market price offers
- **Sites moyens non résidentiels** (66 TWh): 32% new entrants', 95% incumbent's market price offers, 5% incumbent's market price offers
- **Petits sites non résidentiels** (46 TWh): 7% new entrants', 85% incumbent's market price offers, 8% incumbent's market price offers
- **Résidentiels** (127 TWh): 14% new entrants', 95% incumbent's market price offers, 8% incumbent's market price offers
- **Tous sites** (420 TWh): 17% new entrants', 69% incumbent's market price offers, 14% incumbent's market price offers

New entrants' market price offers, Incumbents' market price offers, Incumbents' regulated tariff.
Role of CRE, the French National Regulatory Authority
As regards Electricity markets

- Wholesale market :
  - Market surveillance: monitoring, annual report
  - Implementation of REMIT
  - ARENH: proposes level of compensation (as of entry into force of new decree)
  - enquiries, sanctions (infringement of Energy Code and REMIT)

- Retail market :
  - Opinion of the level of regulated tariff (TRVE) set by the ministers in charge of energy and economy. In 2013: based on detailed analysis of EDF’s costs, made public. As of 2013 CRE will propose the level of TRVE
  - Market surveillance: monitoring, annual report
  - Enquiries, sanction
Regulated tariff (TRVE)

Cost coverage

Identical for all suppliers

CRE decides on network tariffs

Should cover the incumbent operator’s costs.

Required level of the regulated tariff

Actual level of the regulated tariff

The ministers in charge of energy and of economy decide on the level of TRVE (until Dec. 2015). CRE issues an opinion

Regulated tariffs should cover the costs of the incumbent operator (art. L. 337-5 and L. 337-6 of Energy Code)

Costs are not covered

CRE studies in its publications the coverage of the incumbent operator costs by the regulated tariff.
Regulated tariff
Breakdown of costs by tariff category – June 2013

Electricity, Natural Gas and CO2 market observatory, CRE
2nd Quarter of 2013

* According to the Eurostat definitions on types of clients:
  Dc : Household client with consumption of 2500-5000 MWh
  Ib : Industrial client with consumption of 20-500 MWh
  Ie : Industrial client with consumption of 20 000-70 000 MWh

**Note: VAT is excluded from the costs for the yellow tariffs and green A tariffs.
Regulated tariff
Cost coverage by tariff category

Cost coverage – 1st of August 2013

Délibération de la Commission de régulation de l’énergie du 25 Juillet 2013, CRE
Market-price offers
Breakdown of costs and contestability

Level of the market-price offer

\[ \Delta = \text{Contestability} \]

Market sourcing (EPEX, EEX...) or and generation

Alternative suppliers mainly buy complementary sourcing on the market.

Costs of the supplier

\( \text{(€ or €/MWh)} \)

Taxes
CSPE, TCFE, CTA et TVA

Network
TURPE

\( \Delta \)

Commercial costs’
Complementary sourcing

ARENH

Commercial costs

Energy

Market price offer sourcing scheme

Regulated tariff sourcing scheme
Market-price offers
Contestability in 2014

- Art L.337-6 – Until the end of 2015, TRVEs are progressively established to cover the market-price offer sourcing scheme (ARENH + Complementary sourcing + etc). The definition of the « complementary sourcing part » – to be used to establish TRVEs as of 2016 – is not set today (market price / or EDF non-nuclear production costs).

- CRE has developed a mathematical model to assess the costs of a normalized supply scheme for a market price offer (ARENH + complementary sourcing) and comparing them to the regulated tariff level (contestability). The complementary sourcing part is set at market price. CRE monitors the progressive decrease of the « scissors effect » between the costs of alternative suppliers and the costs of supply at regulated tariffs.

Calculated increases which has to be applied to the regulated tariff to ensure its contestability in 2014

<table>
<thead>
<tr>
<th>Market price hypothesis (€/MWh)</th>
<th>42</th>
<th>44</th>
<th>46</th>
<th>48</th>
<th>50</th>
<th>52</th>
<th>54</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential blue</td>
<td>4,9%</td>
<td>5,4%</td>
<td>6,0%</td>
<td>6,5%</td>
<td>7,1%</td>
<td>7,6%</td>
<td>8,2%</td>
</tr>
<tr>
<td>Non residential blue</td>
<td>-0,9%</td>
<td>-0,2%</td>
<td>0,5%</td>
<td>1,2%</td>
<td>1,9%</td>
<td>2,7%</td>
<td>3,4%</td>
</tr>
<tr>
<td>Yellow</td>
<td>0,3%</td>
<td>0,9%</td>
<td>1,6%</td>
<td>2,2%</td>
<td>2,8%</td>
<td>3,5%</td>
<td>4,1%</td>
</tr>
<tr>
<td>Green</td>
<td>-1,1%</td>
<td>-0,4%</td>
<td>0,3%</td>
<td>1,0%</td>
<td>1,7%</td>
<td>2,4%</td>
<td>3,1%</td>
</tr>
</tbody>
</table>

Délibération de la Commission de régulation de l’énergie du 25 Juillet 2013, CRE
Regulated tariffs vs Market price offer: next steps

- TRVE may be challenged
  - on the grounds that it does not cover EDF’s costs
  - or that there is no significant reduction of the « scissors effect ».

- Target level for the regulated tariff. Maximum between
  - Coverage of costs of incumbent operator cost coverage (financial balance)
  - Level ensuring contestability by market price offers (opening to competition)

- By the end of 2015, the yellow and green tariffs will be phased out and each site (with a power level > 36kVA) will have to switch to a market price offer.
Regulated tariffs are split up into different time-of-use tariffs (fixed in the time or mobile)

<table>
<thead>
<tr>
<th>Time-of-use elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>BASE</td>
</tr>
<tr>
<td>Jour Bleu HP</td>
</tr>
</tbody>
</table>

For retail clients, market price offers include only basic time-of-use elements (Base or Peak/Off Peak option).

The development of smart meters (Linky) and the promotion of demand response (NEBEF, capacity market) should enhance the suppliers ability to propose more sophisticated offers.
Regulated tariffs: a decrease in real terms

Tariff movements since 2008 (current €)

<table>
<thead>
<tr>
<th>Date</th>
<th>Blue tariffs</th>
<th>Yellow tariffs</th>
<th>Green tariffs</th>
</tr>
</thead>
<tbody>
<tr>
<td>16th of August 2008</td>
<td>+2%</td>
<td>+6%</td>
<td>+8%</td>
</tr>
<tr>
<td>15th of August 2009</td>
<td>+1.9%</td>
<td>+4%</td>
<td>+5%</td>
</tr>
<tr>
<td>15th of August 2010</td>
<td>+3.2%</td>
<td>+4.5%</td>
<td>+5.5%</td>
</tr>
<tr>
<td>1st of July 2011</td>
<td>+1.7%</td>
<td>+3.2%</td>
<td>+3.2%</td>
</tr>
<tr>
<td>23th of July 2012</td>
<td>+2%</td>
<td>+2%</td>
<td>+2%</td>
</tr>
<tr>
<td>1st of August 2013</td>
<td>+5%</td>
<td>+2.7%</td>
<td>+0.0%</td>
</tr>
</tbody>
</table>

Regulated tariff evolution on the 10 last years

<table>
<thead>
<tr>
<th>From 2002 to 2012</th>
<th>After the 1st of August 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Current €</td>
</tr>
<tr>
<td>Residential blue</td>
<td>+12%</td>
</tr>
<tr>
<td>Non residential blue</td>
<td>+13%</td>
</tr>
<tr>
<td>Yellow</td>
<td>+22%</td>
</tr>
<tr>
<td>Green</td>
<td>+24%</td>
</tr>
</tbody>
</table>
EDF annual production investments are increasing significantly.

- Strong increase in production investments
  Flamanville 3, steam generators, 10-year outage, increase in security level (particularly « post Fukushima » developments)

**Components of the market price offers**

- ARENH
  - price calculation method will be set by decree (after opinion from CRE), and price will be proposed by CRE
  - ARENH volume depending on the type of client (« flat » consumption curve has in proportion more ARENH rights)

- Market’s fluctuations (short and long term)
Important investments in the networks

TURPE 4 transmission:
- + 2.4% in 2013,
- Each year between 2014 and 2017 according to inflation

1 January 2014: TURPE 4 for distribution sites
- Increase of the tariffs level
- Annual review (on the 1st of August) linked to the inflation index
Evolution of the key components of the electricity bill: +30% between 2012 and 2017

- Results owing to specific hypothesis at the date of calculation (Inflation, ARENH, TURPE, EDF commercial costs, CSPE and market prices)
  - Market prices have drastically fallen from November 2012 to now. In November, the price was at an average level of 55 €/MWh whereas now it is fluctuating around 42 €/MWh
  - ARENH price: 42€/MWh in 2012 and 2013, +2%/year from 2014 to 2017

This graphic will be updated in the next retail market monitoring report.
French electrical consumption is thermo-sensitive, leading to very high consumption for heating. A record has been reached the 8th of February 2012 at 102 GW. Peak consumption can lead to tension on the French system and to very high spot prices. Negative prices can occur in case of low consumption and non-flexible production. Such events have no direct effect on the fixed or regulated tariffs paid by end customers. However, market participants take into account these spikes in the future contracts.

**Spot prices in France (weekly average of prices and sum of volumes)**

Source: RTE

Source: EPEX Spot, Analyse: CRE
Prices of electricity calendar products are decreasing due to renewable production in Germany and due to decreasing coal and emission prices. Lower market prices enable suppliers to access to a lower complementary sourcing for their customers. Below 42 €/MWh wholesale market is a substitute to ARENH mechanism. A growth of the price spread between France and Germany can be observed, partly due to a strong development of renewables capacities. Whereas France was exporting electricity to Germany in 2011, it was a net importer in 2012 (8,7 TWh).
• Peakload prices are around 14 €/MWh higher than baseload prices in year ahead contracts
• Market participants are taking into account a risk for futures peak prices on the spot market
• However the spread between baseload and peakload prices is slightly decreasing due to renewables capacities
EDF capacity costs are taken into account in the calculation of the level and the structure of regulated tariffs.

As regards other producers:
- currently: Limited incentive effect for investments particularly in peak-load power plants
- By 2016: Capacity market development aims at appropriately compensating the « missing money » of the production capacities.
Different sourcing schemes

- France: About 80% to 85% of ARENH
  - A regulated price based on relatively steady and predictable nuclear production costs
  - Uncertainties: volume cap of ARENH (100 TWh) reached in 2016? potential participation of the clients in new base power units investments? Capacity market development?
  - Exeltium contract

- Germany: Sourcing mainly at wholesale market prices
  - High volatility of prices
    - Prices in 2013 for a delivery in 2014 similar to ARENH price level → energy part of the bill similar in France and Germany
    - Yet prices in 2012 for a delivery in 2013 were much higher than ARENH in Germany
    - Wholesale market prices steadily decreased since 2011
  - Transmission network cost exemptions (depending on the consumption curve)

Differences on network tariff and support to renewable energies

Interruptibility

- similar remuneration scheme
- the German system is more flexible