Demand in December 2016 was higher by more than 13% compared to December 2015, due to the significantly lower temperatures. The balance of exchanges was in favour of imports for the first time since February 2012. The December overview is published in the same time as the 2016 annual electricity report (http://bilan-electrique-2016.rte-france.com/). You will find there the analysis of the whole year.

Adjusted electricity demand remained unchanged.

Fossil fuel thermal generation reached 7.4 TWh, its highest level since February 2012.

Wind power production was low, with an average wind load factor of around 17%.

In relation to the population, regional demand was between 0.65 per capita in Ile-de-France and 0.89 MWh per capita in Normandie and Auvergne-Rhône-Alpes.

Market prices remained very high in Europe outside the Christmas period.

The monthly balance of French exchanges was in favour of imports, which had not happened since February 2012.

25 new installations went into service in December 2016.
key developments

DEMAND
Gross demand came to 50.6 TWh. It increased by over 13% compared with December 2015, due to average temperatures that were 4.1° lower. Adjusted for weather vagaries, the trend towards stability was confirmed for all sectors.

GENERATION
Nuclear generation of 36.7 TWh, was much lower than that of December 2015 (-9%). Accordingly, and because of the low temperatures experienced, fossil fuel thermal production reached a very high level, of 7.4 TWh (+78% compared to December 2015). Hydraulic production was higher than that of December 2015 (+22%).

WIND AND SOLAR
The increase in installed photovoltaic energy capacity was reflected in an increase in the generation for the month compared to December 2015 (+14%). Monthly wind power generation was strongly down compared to 2015 (-42%). The wind power generation load factor for the month was particularly low, at 17% on average.

TERRITORIES AND REGIONS
Regional demand in relation to the population came to 0.78 MWh per capita. It ranged, according to the region, between 0.65 and 0.89 MWh per capita. Regional generation in relation to the population was highly variable depending on the region. It thus ranged between 0.05 and 3.2 MWh per capita.

ELECTRICITY MARKETS
Prices decreased slightly compared to November (except in Spain and Portugal), but remain very volatile. On the one hand, France, Belgium and Britain recorded a new monthly price peak on Thursday 1 December (as high as €266.9/MWh at 6 pm in France and in Belgium, €273.2/MWh in Britain). On the other hand, the German price became negative for 35 hourly periods between Saturday 24 and Tuesday 27 December (as low as -€67.1/MWh) whereas wind power generation exceeded 30 GWh in the country.

INTERNATIONAL EXCHANGES
The monthly balance of French exchanges was in favour of imports, which had not happened since February 2012, with imports of 0.13 TWh. The import balance to the CWE area was twice that of December 2015. The exchange balance was negative towards Great Britain. It remained positive but at much lower levels than in December 2015 towards Switzerland (-74%) Italy (-84%) and Spain (-43%).

NEW INSTALLATIONS
The main purpose of the 25 installations commissioned in December 2016 was on the one hand to increase and secure the power supply in the territories in question and on the other hand to accept the generation of renewable energy. Several customer-distributors were also connected.
## Consumption

### Monthly energy consumption

**Monthly gross consumption**

<table>
<thead>
<tr>
<th>Month</th>
<th>GWh</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan-16</td>
<td>50,602</td>
</tr>
<tr>
<td>Feb-16</td>
<td>50,300</td>
</tr>
<tr>
<td>Mar-16</td>
<td>49,900</td>
</tr>
<tr>
<td>Apr-16</td>
<td>49,500</td>
</tr>
<tr>
<td>May-16</td>
<td>49,100</td>
</tr>
<tr>
<td>Jun-16</td>
<td>48,700</td>
</tr>
<tr>
<td>Jul-16</td>
<td>48,300</td>
</tr>
<tr>
<td>Aug-16</td>
<td>47,900</td>
</tr>
<tr>
<td>Sep-16</td>
<td>47,500</td>
</tr>
<tr>
<td>Oct-16</td>
<td>47,100</td>
</tr>
<tr>
<td>Nov-16</td>
<td>46,700</td>
</tr>
<tr>
<td>Dec-16</td>
<td>46,300</td>
</tr>
</tbody>
</table>

**Trend by sector in sliding year adjusted from the climate effect**

- Adjusted national consumption
- Direct RTE customers *
- Adjusted consumption on PDN

*without energy sector

### Peak consumption* December 2016

**Gross monthly consumption at the peak and actual temperature**

- **Gross monthly consumption at the peak (GW)**
  - Jan-16: 81.8 GW
  - Feb-16: 80.5 GW
  - Mar-16: 79.2 GW
  - Apr-16: 77.9 GW
  - May-16: 76.6 GW
  - Jun-16: 75.3 GW
  - Jul-16: 74.0 GW
  - Aug-16: 72.7 GW
  - Sep-16: 71.4 GW
  - Oct-16: 70.1 GW
  - Nov-16: 68.8 GW
  - Dec-16: 67.5 GW

**Deviation from norm (°C)**

- Ma 1: 55°C
- Je 3: 60°C
- Sa 5: 65°C
- Lu 7: 70°C
- Me 9: 75°C
- Ve 11: 80°C
- Di 13: 85°C
- Ma 15: 90°C
- Je 17: 95°C
- Sa 19: 100°C
- Lu 21: 105°C
- Me 23: 110°C
- Ve 25: 115°C
- Di 27: 120°C
- Ma 29: 125°C

**Actual temperature**

**Evolution of monthly power extrema**

- **Max power**
  - Jan-16: 102.1 GW
  - Feb-16: 101.8 GW
  - Mar-16: 101.5 GW
  - Apr-16: 101.2 GW
  - May-16: 100.9 GW
  - Jun-16: 100.6 GW
  - Jul-16: 100.3 GW
  - Aug-16: 100.0 GW
  - Sep-16: 99.7 GW
  - Oct-16: 99.4 GW
  - Nov-16: 99.1 GW
  - Dec-16: 98.8 GW

- **Min Power**
  - Jan-16: 29.5 GW
  - Feb-16: 30.0 GW
  - Mar-16: 30.5 GW
  - Apr-16: 31.0 GW
  - May-16: 31.5 GW
  - Jun-16: 32.0 GW
  - Jul-16: 32.5 GW
  - Aug-16: 33.0 GW
  - Sep-16: 33.5 GW
  - Oct-16: 34.0 GW
  - Nov-16: 34.5 GW
  - Dec-16: 35.0 GW

- **Absolute max**
  - 102.1 GW

- **Absolute min**
  - 29.5 GW

*Without energy sector
Generation

Installed capacity (MW) December 2016

Energy generated (GWh) December 2016

Focus on generation sectors

Monthly Overview - December 2016
Wind and Photovoltaic

Monthly generation

Wind generation

Photovoltaic generation

Load factor of wind generation

Rate of coverage of consumption by wind generation (%)

Fleet development in France

Planned fleet on the PTN

Development of generating fleets in France**

Technology | Installed capacity* at 31/12/16 | Queued projects* | Projects in preparation*
---|---|---|---
Wind | 661 MW | 30 | 2116 MW | 6 | 247 MW
Photovoltaic | 571 MW | 4 | 101 MW | 3 | 58 MW

* Refer to glossary for category definitions

** data available up to December 2016
Regional demand in relation to the population

In relation to the population, demand in December totalled approximately 0.78 MWh per capita.

This ratio was between 0.65 MWh per capita in Île de France and 0.89 MWh per capita in Normandy and Rhône-Alpes Auvergne.

Regional generation in relation to the population

In relation to the population, generation in December totalled approximately 0.79 MWh per capita.

This ratio was between 0.05 MWh per capita in Île de France and 3.2 MWh per capita in Centre Val de Loire.
First Auction using the French Capacity Mechanism

A first auction was organised on the EPEX exchange for capacity certificates for the 2017 delivery year. In total, 226,000 certificates of 0.1 MW were traded, at the price of €999.98 per certificate.

This volume of transactions illustrates the satisfactory liquidity of the certificates’ market. Another auction for the 2017 delivery year will be held in 2017, as well as auctions for future delivery years.
The energy values described correspond to contracted exchanges on Euronext.
Network development

- 63 kV underground cable
  - Archirondel - St-Rémy-des-Landes
  - Manche (50)
  - Renewal of conductors

- 30 kV substation
  - 30 kV underground cables
  - Merie
  - St-Cyr-en-Val
  - Loiret (45)
  - Connecting customer distributor

- 63 kV underground cable
  - St-Aubin - Villers-le-Bac
  - Essonne (91)
  - New consumer backup supply

- 400/90 kV transformer of 240 MVA
  - Mery-sur-Seine
  - Aube (10)
  - Inserting power generation from renewable energy

- 225 kV substation
  - 225 kV overhead-underground line
  - Papin
  - Gampaloup - Papin
  - Isère (38)
  - Connecting customer distributor

- 63 kV overhead-underground line
  - Porte - Pontchateau
  - Ille-et-Vilaine (45)
  - Partial burial of conductors for strengthening the power supply of the Redon urban area

- 225 kV substation
  - 225/63 kV transformer of 170 MVA
  - Orvault
  - Loire-Atlantique (44)
  - Creation of the substation to meet the increase in load of the Nantes urban area

- 63 kV underground cables
  - La Conraie - Orvault
  - Orvult - piquage à Gesvres
  - Loire-Atlantique (44)
  - Following the creation of Orvult substation

- 63 kV underground cable
  - Cantegrit - Garein
  - Landes (40)
  - Burying of cables

- 225/63 kV transformer of 170 MVA
  - Argia (Bayonne sud)
  - Pyrénées-Atlantiques (64)
  - Securing power supply of the south of pays basque

- 63 kV substation
  - 63 kV overhead line
  - Lauragais
  - Lauragais - piquage à Villenouvelle
  - Haute-Garonne (31)
  - Connecting customer distributor

- 63 kV underground cable
  - Mireval - Montpellier
  - Hérault (34)
  - Partial renewal of conductors

- 225 kV substation
  - 225 kV overhead-underground line
  - Bancal iron - Lingostière
  - Hautes-Alpes (05)
  - Strengthening the power supply of the zone of Haute-Durance

- 150 kV overhead line
  - Bancal iron - Lingostière
  - Alpes-Maritimes (06)
  - Partial renewal of the line to increase the overload capacity of the line

- 63 kV underground cable
  - Bajatière - Eybens
  - Isère (38)
  - Partial renewal of conductors

- 63 kV underground cable
  - Briançon - Serre-Barbin
  - Hautes-Alpes (05)
  - Securing power supply of the zone of Haute-Durance

- 63 kV overhead-underground line
  - Lingostière - Plan du Var
  - Alpes-Maritimes (06)
  - Partial renewal of the line to increase the overload capacity of the line

- 225 kV substation
  - 225 kV overhead-underground line
  - Digue-des-Français - Lingostière
  - Alpes-Maritimes (06)
  - Re-routing of a power line as part of the extension of the new tram line of Nice

- 400 kV
- 225 kV
- 63 to 150 kV

Monthly Overview - December 2016
This document relies on metered data collected by RTE and also on data sent by the French DSOs, especially eRDF and EDF SEI.

### Data sources
- **Monthly consumption**: France with Corsica, losses included.
- **Extreme capacity value trend**:
  - **Max/Min Power**: Maximum/minimum power consumption in France over the month, excluding Corsica.
  - **Absolute extreme value**: Extreme value for consumption observed since 1 January 2008.

### Gross national demands and actual temperatures
- Daily peak for perimeter France excl. Corsica.
- For more information on how actual temperatures and reference temperatures are calculated, visit RTE's website: [http://www.rte-france.com/telepoids/media_apercus_an](http://www.rte-france.com/telepoids/media_apercus_an).

### Trend by sector in sliding year adjusted from the climate effect
- **Total consumption**: Consumption of France, with Corsica, losses included.
- **Adjusted consumption on PPN**: Represents the consumption of residential and SMEs/SMiS sector, data adjusted from weather effect.
- **Direct RTE customers**: Industrial sites connected directly to the PPN (excluding consumption at source). Energy sector is excluded.
- **Trend in sliding year**: Growth between the last 12 cumulative monthly values and the previous 12.

### Generation
- **Wind Generation**:
  - **Load factor**: Ratio of wind power generated to nominal installed wind capacity.
  - **Wind**: Onshore and offshore wind projects. The share of offshore capacity is indicated in the row below.
  - **Installed capacity**: Cumulative capacity of installations for which a connection agreement has been signed.
  - **Queued projects**: Projects which have entered the connection queue under RTE's connection procedure, i.e. projects which have signed a “queuing proposal” with RTE, following a detailed connection study or a “technical and financial proposal”.
  - **Projects in preparation**: Connection projects for which RTE has been asked to provide a detailed study or technical and financial proposal, currently being examined by RTE, or for which the project authority is RTE.

### Coverage of demand
- **Coverage rate**: Ratio of wind power generated to gross national consumption at a given time.

### Prices in Europe
- **Spot price**: Wholesale price of electricity, determined by the power exchanges the day before for the following day, for each hour of the day.
- **Spread**: Price differential between two price areas (here between each price area and France).
- **Price area**: Geographic area inside which the electricity price is identical and where exchanges are done with no allocation of capacity. A price area may combine several countries (for example: Germany, Austria, Luxembourg) and a country may be subdivided into more than one price area (for example: Italy, Norway).

### Daily spot price changes
- Change of the spot price in France and in the coupled neighbouring regions, over a month in daily average, (NB: for Italy the price of the northern area is shown, for Nordic countries the average of the areas displayed on the map is shown).

### International exchanges
- **Daily extrema**: Extrema of the half hour mean power value of the global international commercial exchanges, observed daily.
RTE KEY FIGURES for 2015

> 8500 employees
> 105 000 km of lines
> 2 710 substations
> € 1 402 million of investments